MSC Sustainable Fisheries Certification

Lake Peipus Perch and Pike-Perch Fishery

Public Consultation Draft Report

July 2017

Client: Logi-F

Assessment Team: Rob Blyth-Skyrme, Dmitry Sendek, Tim Huntington

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List of Acronyms

B*a*	Available stock biomass
B_{LIM}	Biomass limit reference point
B_{MSY}	The level of biomass resulting in maximum sustainable yield
B_N	Commercial stock abundance
CAB	Conformity Assessment Body
CFP	Common Fisheries Policy
CoC	Chain of Custody
EEI	Estonian Environmental Inspectorate (Estonia)
EFF	European Fisheries Fund
EMFF	European Maritime and Fisheries Fund
ERFC	Estonia – Russia Fisheries Commission
ETP	Endangered, Threatened or Protected
EU	European Union
F	Fishing mortality
FFA	Federal Fisheries Agency (*Rosrybolovstvo)* (Russia)
FLAG	Fisheries Local Action Group
F_{MSY}	The rate of fishing mortality that results in the maximum sustainable yield
FSB	Federal Security Service (Russia)
GosNIORH	State Research Institute of Lake and River Fisheries (Russia)
HCR	Harvest Control Rule
ICJ	International Court of Justice
IUU	Illegal, Unreported and Unregulated
LPPF	Lake Peipus perch and pike-perch fishery
LRP	Limit Reference Point
MCS	Monitoring, Control and Surveillance
MoE	Ministry of Environment (Estonia)
MoRA	Ministry of Rural Affairs (Estonia)
MSC	Marine Stewardship Council
MSY	Maximum Sustainable Yield
NGO	Non-governmental organisation
PA	Precautionary approach
PCDR	Public Comment Draft Report
PCR	Public Certification Report
PCTC	Peipsi Center for Transboundary Cooperation

PI	Performance Indicator
SAC	Special Area of Conservation
SG	Scoring Guidepost
SI	Scoring Issue
SPA	Special Protection Area
SSB	Spawning Stock Biomass
TAC	Total Allowable Catch
TRP	Target Reference Point
UoA	Unit of Assessment
UoC	Unit of Certification
VMS	Vessel Monitoring System

1 Executive summary

This report provides the results of the MSC assessment of the Lake Peipus Perch and Pike-perch Fishery, which is undertaken with gillnets and trapnets in Estonian waters of Lake Peipus.

The client was Logi-F, and the assessment process started on 15th September 2016. The Assessment Team for this fishery assessment comprised of Dr. Rob Blyth-Skyrme, who acted as team leader and was primarily responsible for evaluation of Principle 2, Dr. Dmitry Sendek, who was primarily responsible for evaluation of Principle 1, and Tim Huntington, who was primarily responsible for evaluation of Principle 3.

The Lake Peipus Perch and Pike-perch Fishery occurs on Lake Peipus (Pskovsko-Chudskoe Ozero in Russian), a lake of approximately 3,555 km^2 that is located on the border of the Republic of Estonia and the Russian Federation (Figure 1). The Lake Peipus Perch and Pike-perch Fishery targets European perch (*Perca fluviatilis*) and pike-perch (*Sander luioperca*); both are predatory percids that are native to Lake Peipus and the surrounding region. The fishery is divided in to two Units of Assessment (UoAs), with the fisheries for perch comprising UoA 1, and the fisheries for pike-perch comprising UoA 2.

There are a number of areas where the fishery performs well against the MSC Standard;

For Principle 1, the Lake Peipus stock of both perch and pike-perch are in generally good condition, with a series of recent, strong year classes that should support the fishery in coming years. Management of the fishery is based around the setting of total allowable catches (TACs) that are agreed between Russia and Estonia on an annual basis. Information on catches is collected at a high level of detail, and directed fisheries in Estonia are closed when around 90% of the TAC is taken for each species, so allowing room for the remainder to be taken as bycatch when targeting other species. Fishery independent surveys are undertaken routinely and inform annual stock assessments for both species.

For Principle 2, the stocks of primary species are also well managed and annual assessments of stock status are undertaken, while the only secondary species to be assessed is Crucian carp, which qualifies as a minor element of the fishery. Knowledge of the habitats in the lake is good, while ecosystem Performance Indicators were scored at a high level in part because there is a long history of research having been undertaken to study the lake's fish community and its response to environmental change.

For Principle 3, positive aspects include that well-developed legislative frameworks exist in both Estonia and Russia, and legal rights for users are well established. The management system actively consults users, and the transboundary Estonia-Russia Fisheries Commission meets annually and demonstrably functions in a manner that results in sustainable fisheries. The monitoring, control and surveillance system is intensive, for example all vessels other than rowing boats are required to operate a vessel monitoring system, and fishermen must declare their landings daily, in advance of returning to port. Sanctions for non-compliance with the regulations can be severe.

Overall, the Assessment Team concluded that the Lake Peipus Perch and Pike-perch Fishery should score as follows (Table 1):

Table 1: Principle scores for both UoAs of the Lake Peipus Perch and Pike-Perch Fishery

	UoA	
Principle	1 (Perch)	2 (Pike-perch)
Principle 1 – Target Species	84.2	84.2
Principle 2 – Ecosystem	85.7	
Principle 3 – Management	81.9	

As such, it is determined that both UoAs of the Lake Peipus Perch and pike-perch Fishery meet the MSC Standard and should be certified as a sustainable fishery. The Target Eligibility Date for products from the fishery is the publication date of the Public Comment Draft Report.

1.1 Conditions of Certification

In a number of areas, the Lake Peipus Perch and Pike-perch Fishery was considered to be not meeting the MSC passing score of 80, therefore triggering the introduction of binding Conditions of Certification; these must be addressed in the specified timeframe. Full explanation of these conditions is provided in the relevant scoring rationales (Appendix 1), and in the detailed Condition texts (Appendix 3), but brief summaries of the conditions are presented in Table 2, below:

Table 2: Summary of the conditions set against the Lake Peipus Perch and Pike-perch Fishery at assessment

#	UoA	PI and SI	Condition
1	**1 (Perch)**	**1.2.2 (b)**	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SIb is met, specifically through demonstrating the following: SIb: "*The HCRs are likely to be robust to the main uncertainties*."
2	**1 (Perch)**	**1.2.4 (c)**	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SIc is met, specifically through demonstrating the following: SId: "*The assessment takes uncertainty into account.*"
3	**2 (Pike-perch)**	**1.2.1 (f)**	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SIf is met, specifically through demonstrating the following: SId: "*There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate*."
4	**2 (Pike-perch)**	**1.2.4 (c)**	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SIc is met, specifically through demonstrating the following: SId: "*The assessment takes uncertainty into account*."
5	**1 & 2**	**2.3.2 (b and c)**	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SIb and SIc are met, specifically through demonstrating the following: SIb: "*There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species.*" SIc: "*There is an objective basis for confidence that the strategy will work, based on information directly about the fishery and/or the species involved*."
6	**1& 2**	**2.3.2 (e)**	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SId is met, specifically through demonstrating the following: SIe: "*There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related*

#	UoA	PI and SI	Condition
			mortality of ETP species and they are implemented as appropriate."
7	**1& 2**	**2.3.3 (a and b)**	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SIa and SIb are met, specifically through demonstrating the following: SIa: "*Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species.*" SIb: "*Information is adequate to measure trends and support a strategy to manage impacts on ETP species*."
8	**1 & 2**	**3.1.3 (a)**	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SIa is met, specifically through demonstrating the following: SIa: "*Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach are explicit within management policy.*"

2 Authorship and peer reviewers

2.1 Assessment team

All team members listed below have completed all requisite training and signed all relevant forms for assessment team membership on this fishery.

Assessment team leader: Dr. Rob Blyth-Skyrme

Primarily responsible for assessment under Principle 2

Rob started his career in commercial aquaculture, but prior to undertaking his PhD he shifted focus to the sustainable management of wild fisheries. He subsequently worked at the Eastern Sea Fisheries Joint Committee where he became the Deputy Chief Fishery Officer, with a focus on fisheries management and enforcement. He then moved to Natural England, acting as the organisation's senior advisor to UK Government on fisheries and environmental issues, leading a team dealing with fisheries policy, science and nationally significant fisheries and environmental casework. Rob now runs Ichthys Marine Ecological Consulting Ltd., a fisheries and environmental consultancy. As well as providing general fisheries consultancy, he has undertaken all facets of MSC work as a lead assessor, expert team member and peer reviewer across a large number of fisheries. Rob is a member of the MSC's Peer Review College, and has completed the MSC v1.3 and v2.0 training modules.

Expert team member: Dr. Dmitry Sendek

Primarily responsible for assessment under Principle 1

Dmitry has worked for 25 years as a professional fishery scientist. Since 2000 he served as a Senior Researcher at the Laboratory of Monitoring of Salmonid Fish Populations, State Research Institute on Lake and River Fisheries (GosNIORKh), St. Petersburg. From 1994 to 2000 he worked as a Researcher at the Laboratory of Fish Genetics, State Research Institute on Lake and River Fisheries (GosNIORKh), St. Petersburg. And from 1991 – 1993 he was employed as a Laboratory Assistant at the Laboratory of Cell Populations, Salmonid Fish Genetics Group. Institute of Cytology, Russian Academy of Sciences, St. Petersburg. Dmitry received PhD in zoology in 2000 from the State Research Institute on Lake and Rivers Fisheries (GosNIORKh), St. Petersburg with a thesis on the "Phylogenetic analysis of Coregonid fishes by means of allozyme electrophoresis method." His research interests include: Evolution, phylogeography and systematics of coregonids species on the basis of molecular markers analysis; Population genetics of fish species: coregonids, Atlantic salmon, Sea trout, European grayling, Arctic char, European smelt, Sockeye salmon, and Pink salmon; Genetic conservation of coregonids fishes in Eurasia, and investigation of fish fauna of poorly studied water bodies of the Northern Russia.

Expert team member: Tim Huntington

Primarily responsible for assessment under Principle 3

Tim is a founding Director of the Poseidon Aquatic Resources Management Ltd. and has over 25 years of industry, consulting and research experience in fisheries and the aquatic environment. He has a BSc (Hons) in Biological Sciences from Portsmouth University and a Masters in Applied Fish Biology from Plymouth University. Tim started his career working for the aquaculture and capture fisheries industries in the UK and overseas, including managing marine cage farms in Scotland and running a fish buying and processing business in the Middle East. Over the last twenty years of his career, Tim has specialised in assisting the development of responsible fishing and aquaculture practices; including sectoral policy and strategy development and the integration of fisheries and aquaculture into overall coastal development as well as specific assistance using approaches such as the Marine Stewardship Council (MSC) certification scheme of responsible fisheries, together with

strategic and site-specific Environmental Impact Assessment (EIA) for aquaculture and other coastal development. Tim has worked for a wide range of clients (including the World Bank, World Trade Organisation, Global Environment Facility, UNDP, FAO, Asian Development Bank, DANIDA, the EC and DFID).

2.1.1 RBF Training

Dr. Rob Blyth-Skyrme and Tim Huntington have been fully trained in the use of the MSC's Risk Based Framework (RBF), but the RBF was not used for this fishery assessment.

2.2 Peer Reviewers

Peer reviewers used for this report were Andy Houigh and Vito Romito.

A summary CV for each is available in the 'assessment downloads' section of the LPPF's entry on the MSC website (https://www.msc.org/track-a-fishery/fisheries-in-the-program/in-assessment/inland/Lake-Peipus-perch-pike-perch).

Peer Reviewer 1: Dr. Andrew Hough

Andrew has been active in the development of Marine Stewardship Council certification since 1997, when involved in the pre-assessment of the Thames herring fishery. He was a founding Director of Moody Marine, led the establishment of Moody Marine fishery certification systems and has represented Moody Marine at all MSC workshops until 2011. He has also worked with MSC on several specific development projects, including those concerned with the certification of small scale/data deficient fisheries.

He has been Lead Assessor (and often also expert team member) on many fishery assessments to date. This has included Groundfish (e.g. cod, haddock, pollock, hoki, hake, flatfish), Pelagics (e.g. tuna species, herring, mackerel, sprat, krill, sardine) and shellfish (molluscs and crustacea); included evaluation of the environmental effects of all main gear types and considered many fishery administrations including the North Atlantic, South Atlantic, Pacific, Southern Ocean and in Europe, North America, Australia and New Zealand, Japan, China, Vietnam and Pacific Islands. He has recently acted solely as an expert team member of Principle 2 inputs of European inshore fisheries and Falkland Islands Toothfish.

He has carried out peer reviews for various CABs including fisheries for molluscs, crustacea and freshwater finfish. Other assessments include Chain of Custody assessments for merchants, processors, distributors and retailers.

Andrew has also been involved in the development of certification schemes for individual vessels (Responsible Fishing Scheme) and evaluation of the Marine Aquarium Council standards for trade in ornamental aquarium marine species. Consultancy services have included policy advice to the Association of Sustainable Fisheries, particularly with regard to the implications of MSC standard development, and assistance to fisheries preparing for, or engaged in, MSC assessment.

Peer Reviewer 2: Vito Ciccia Romito

Vito holds a BSc (Hons) in Ecology and an MSc in Coastal Area Management from Newcastle University in the U.K. After his degree, he spent a year at the Mafia Island Marine Park, in Tanzania, carrying out biodiversity assessments and monitoring studies of the local coral reef and mangrove ecosystems. Since 2010, Vito has worked with Global Trust Certification Ltd where he headed the now internationally established and ISO accredited FAO-based Responsible Fisheries Management (RFM) Assessment and Certification Program covering all the major commercial fisheries in Alaska, Iceland and most recently, Louisiana. He has also carried out several IFFO fisheries assessments in

both Chile, Peru, and Europe and other verification assessments in Atlantic and Pacific Canada. To date, Vito has headed and conducted over 30 fishery assessments involving 40 + different species including salmonid, groundfish, pelagic, flatfish, crustacean and cephalopod species. He is a lead, third party IRCA approved auditor, has completed the MSC Lead assessor training and has been involved in the MSC program and key aquaculture certification programs from a Certification Body perspective.

More recently, Vito shifted into consultancy where he was involved primarily in the progression and development of the Alaska RFM Standard to Version 1.3 and 2.0, and with the GSSI Benchmark. Vito has also been involved with the development of low cost assessment tools to improve data availability and certification opportunities for small scale and data limited fisheries.

3 Description of the fishery

3.1 Units of assessment (UoAs) and scope of certification sought

There are two Units of Assessment (UoAs) for the Lake Peipus Perch and Pike-perch Fishery:

1) Perch (*Perca fluviatilis*) taken in the Estonian waters of Lake Peipus using gillnets and trapnets,

2) Pike-perch (*Sander lucioperca*) taken in the Estonian waters of Lake Peipus using gillnets and trapnets.

The two UoAs are detailed, below:

UoA 1	
Species:	Perch (*Perca fluviatilis*)
Stock:	Lake Peipus (comprising Lake Peipsi, Lake Lämmijärv and Lake Pihkva, together)
Geographical area:	Estonian waters of Lake Peipus, which sits on the Estonia-Russia border in Northern Europe.
Harvest method:	Gillnets and trapnets
Client Group:	Logi-F
Other eligible fishers:	Any licensed commercial fisherman working legally in Estonian waters of Lake Peipus using gillnets and/or trapnets.

UoA 2	
Species:	Pike-perch (*Sander lucioperca*)
Stock:	Lake Peipus (comprising Lake Peipsi, Lake Lämmijärv and Lake Pihkva, together)
Geographical area:	Estonian waters of Lake Peipus, which sits on the Estonia-Russia border in Northern Europe.
Harvest method:	Gillnets and trapnets
Client Group:	Logi-F
Other eligible fishers:	Any licensed commercial fisherman working legally in Estonian waters of Lake Peipus using gillnets and/or trapnets.

This UoAs as defined are compliant with client wishes for assessment coverage and in full conformity with MSC criteria.

3.2 Consideration of MSC scope criteria

The MSC FCR v.2.0 (MSC 2014) requires consideration of fisheries under assessment against the following scope requirements:

- **7.4.1.1: Species in scope** – Perch and pike-perch are not among the list of taxa that may not be target species under Principle 1.
- **7.4.1.2: Poisons or explosives** – The Lake Peipus Perch and Pike-perch Fishery does not use poisons or explosives.
- **7.4.1.3: Controversial unilateral exemptions** – the Lake Peipus Perch and Pike-perch Fishery is not conducted under a "*controversial unilateral exemption to an international agreement*".
- **7.4.1.4: Forced labour violations** – The client or client group does not include an entity that has been successfully prosecuted for a forced labour violation
- **7.4.2. Controversial disputes** – there are mechanisms in place for resolving disputes between the fishery and the management system.
- **7.4.3: Enhanced fishery** – The Lake Peipus Perch and Pike-perch Fishery is not enhanced.
- **7.4.4: Introduced species based fishery** – Both perch and pike-perch are native to Lake Peipus, and so ISBF considerations do not apply.

Marine Certification therefore confirms that the Lake Peipus Perch and Pike-perch Fishery is within scope of the MSC certification sought.

3.3 Final UoCs

The final UoCs will be confirmed at the PCR stage, but are intended to be as follows:

UoC 1	
Species:	Perch (*Perca fluviatilis*)
Stock:	Lake Peipus (comprising Lake Peipsi, Lake Lämmijärv and Lake Pihkva, together)
Geographical area:	Estonian waters of Lake Peipus, which sits on the Estonia-Russia border in Northern Europe.
Harvest method:	Gillnets and trapnets
Client Group:	Logi-F and any other fish processors/buyers in the client group.
Other eligible fishers:	Any licensed commercial fisherman working legally in Estonian waters of Lake Peipus using gillnets and/or trapnets.

UoC 2	
Species:	Pike-perch (*Sander lucioperca*)
Stock:	Lake Peipus (comprising Lake Peipsi, Lake Lämmijärv and Lake Pihkva, together)
Geographical area:	Estonian waters of Lake Peipus, which sits on the Estonia-Russia border in Northern Europe.
Harvest method:	Gillnets and trapnets
Client Group:	Logi-F and any other fish processors/buyers in the client group.
Other eligible fishers:	Any licensed commercial fisherman working legally in Estonian waters of Lake Peipus using gillnets and/or trapnets.

3.3.1 Total UoA and UoC catch for the target species

The data on quota and catches for the Lake Peipus Perch and Pike-perch Fishery are presented in Table 3 and Table 4, below.

It is noted that the UoA and UoC shares of the total allowable catch (TAC) are presented as 'up to' a figure (the Estonian TAC) because the Estonian fishery operates on an Olympic system, where the quota is not apportioned to particular gear types and the catch is taken on a first come – first served basis. As such, all or only a proportion of the catch of perch and pike-perch may be taken in gillnets or trapnets in the assessed Lake Peipus fishery.

Table 3: UoA 1 (Perch) quota and catch data (t) for the Lake Peipus Perch and Pike-perch Fishery (Source: https://www.agri.ee/et/eesmargid-tegevused/kalamajandus-ja-kutseline-kalapuuk/puugiandmed).

TAC (Estonia + Russia)	**Year**	2016	**Amount**	2131.8
UoA (Estonia) share of TAC	**Year**	2016	**Amount**	up to 1031.8
UoC share of TAC	**Year**	2016	**Amount**	up to 1031.8
Total green weight catch by UoC	**Year (most recent)**	2016	**Amount**	716.3
	Year (2nd most recent)	2015	**Amount**	672.2

Table 4: UoA 2 (Pike-perch) quota and catch data (t) for the Lake Peipus Perch and Pike-perch Fishery
(Source: https://www.agri.ee/et/eesmargid-tegevused/kalamajandus-ja-kutseline-kalapuuk/puugiandmed).

TAC (Estonia + Russia)	**Year**	2016	**Amount**	1582.5
UoA (Estonia) share of TAC	**Year**	2016	**Amount**	up to 757.5
UoC share of total TAC	**Year**	2016	**Amount**	up to 757.5
Total green weight catch by UoC	**Year (most recent)**	2016	**Amount**	575.0
	Year (2nd most recent)	2015	**Amount**	372.7

3.4 Overview of the fishery

3.4.1 Fishery background

The Lake Peipus Perch and Pike-perch Fishery occurs on Lake Peipus (Pskovsko-Chudskoe Ozero in Russian) that is located on the border of the Republic of Estonia and the Russian Federation (Figure 1). It is noted that Lake Peipus in its entirety is sometimes referred to as Lake Peipsi, but that this is also the individual name of the northern-most of the three lakes that together comprise Lake Peipus. For the purpose of this assessment, then, all three lakes together are named Lake Peipus, and Lake Peipsi will be used to refer to the northern-most lake, only.

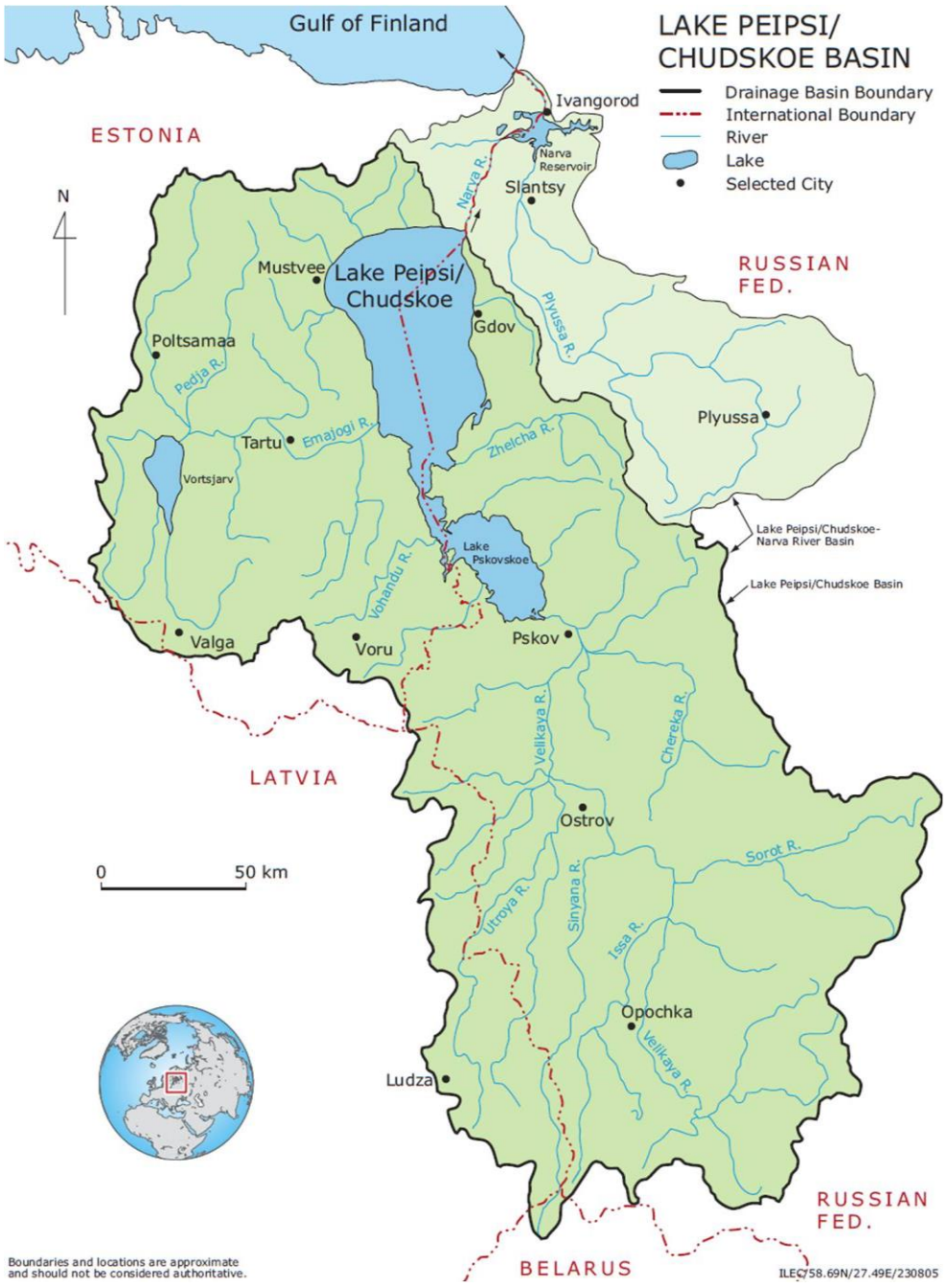

Figure 1: The Lake Peipus basin
(Source: Roll et al. 2006)

By surface area (3555 km^2), Lake Peipus is the fourth largest European lake. The lake consists of three parts: the largest and deepest northern part is called Lake Peipsi (Lake Chudskoe in Russian, area = 2611 km^2, mean depth = 8.3 m, maximum depth = 12.9 m), the middle strait-like part, called Lake Lämmijärv (Lake Teploe in Russian, area = 236 km^2, mean depth = 2.5 m, maximum depth = 15.3 m) and the southern part, called Lake Pihkva (Lake Pskov; area = 708 km^2, mean depth = 3.8 m, maximum depth = 5.3 m).

55% of the area of Lake Peipsi, 50% of Lake Lämmijärv and 1.3% of Lake Pihkva (altogether 1570 km^2) belong to Estonia. The catchment area (47,800 km^2; including the lake) covers the territorial parts of Estonia (roughly one third) and Russia (roughly two thirds), with a tiny proportion in Belarus (Figure 1). The total volume of Lake Peipus is approximately 25 km^3 and the residence time of water is about two years. There are about 240 inlets into Lake Peipus, with the largest rivers being the Velikaya, the Emajõgi, the Võhandu and the Zhelcha. The only outflow is the Narva River, which runs to the Gulf of Finland at a rate of about 12 km^3 per year, forming 3% of total fresh-water inflow to the Baltic Sea (Pihu & Haberman 2001).

The water of the lake is relatively rich in biogenic substances: the mean concentration of total Phosphorus (P) and Nitrogen (N) are 46 mg m^{-3} and 876 mg m^{-3}, respectively. Lake Peipsi *s.s.* is significantly poorer in P and N compounds than Lake Pihkva, which is affected more significantly by pollution originating from the Velikaya River. Pollutants enter Lake Peipus mostly via rivers and polluted precipitation. Both the amount of waste water discharged into waterbodies as well as pollution load have decreased remarkably in recent years owing to progress in waste water treatment and decrease in diffuse pollution from agricultural lands. The average pH of lake water is 8.28, with a Secchi disk transparency 1.9 m. Lake Peipsi *s.s.* is classified as an unstratified eutrophic lakes with mesotrophic features; Lake Lämmijärv has some dyseutrophic features, while Lake Pihkva is strongly eutrophic.

Owing to its large area, Lake Peipus provides a great variety of biotopes with a diverse trophic state, which support water organisms with different ecological requirements. As a result of this the flora and fauna of this lake are quite rich both in the number of species as well as in their abundance. There are found about 100 macrophyte species and 1000 algal species, 291 zooplankton species, 419 macrozoobenthos species, one lamprey and 33 fish species in Lake Peipus or in the lower reaches of its watershed. Furthermore, the life of nine amphibian species, five reptile species, 233 bird species and nine mammal species is closely connected with the coastal region of this large lake (Pihu & Haberman 2001).

Lake Peipus can be considered a large water body of quite high productivity. The biomass of phytoplankton has fluctuated from 1 to 125 g m^{-3} in the lake. The mean biomass of zooplankton (in summer) and macrozoobenthos (not including large molluscs) is 3.1 g m^{-3} and 12.9 g m^2, respectively. Considering its fish catches (since the 1930s usually 8,000-11,000 t or 22-31 kg ha^{-1} yr^{-1}) Lake Peipus surpasses all large lakes of North Europe. The main commercial fishes in the lake are perch, pike-perch, bream, pike, roach, pike, vendace (until the early 1990s) and smelt (until 2000s) (Table 5).

Perch and pike-perch are common species in Lake Peipus, although their role in fishery was different in different periods. In Soviet period, all the fishery were carried out by the state, but in post-Soviet period (since early 1990s) fisheries management was performed based on international Estonian-Russian agreements. From 1994 onwards the co-operative management programme is agreed annually by the Intergovernmental Estonian-Russian Fishery Commission (ERFC). This Commission is responsible for all general decisions on management strategies and technical measures, including the number of different gear licenses and total allowable catches.

Table 5: Estonian catch (t) from Lakes Peipus from 2008-2015, and average catch of these years (Source: Eschbaum et al. 2013, Eschbaum et al. 2014; http://www.agri.ee).

Species	2008	2009	2010	2011	2012	2013	2014	2015	Average
Perch	746	808	1205	757	1061	914	783	814	886
Pike-perch	622	654	508	672	646	637	597	417	594
Bream	370	537	435	578	577	604	740	665	563
Roach	204	189	198	225	207	185	216	207	204
Pike	55	66	46	100	153	143	119	93	97
Smelt	0	0	0	0	0	0	0	0	0
Whitefish	1	3	1	0	0	0	0	0	1
Vendace	1	1	0	1	3	10	19	11	6
Burbot	25	27	26	30	21	23	20	17	24
Other	65	76	41	9	3	5	6	8	29
Total	2089	2360	2461	2371	2671	2520	2500	2232	2425

The Estonian portion of Lake Peipus is a public property of Estonia, and so implementation and enforcement of Estonian management measures are responsibilities of the Department of Fisheries, Estonian Ministry of the Environment. However, the lake is also partly controlled and managed by the Russian Federation, and so the distribution of gear licenses between Estonia and Russia is set up annually by the Estonia – Russia Fisheries Commission (ERFC). Further distribution of gear licenses between users is the responsibility of county governors.

In Russia the main body managing fisheries is the Federal Fisheries Agency. In the Pskov region, there is the Scientific Fishing Council at the administration of the Pskov region. This Council is the advisory body dealing with management issues such as fishing regulations, which sends its proposals to the Federal Fisheries Agency for approval.

At present the management system in Lake Peipus consists of: (1) input controls, i.e. fishing effort controls such as the number and type of gear licenses; (2) output controls, such as maximum landing sizes; and (3) technical measures, such as closed seasons and closed areas.

Commercial fishing is undertaken in Lake Peipus by about 60-70 Estonian companies and 300-400 fishermen, although the number has varied somewhat over recent times (Table 6). Small scale fishing and fishing for family needs is no longer considered profitable (Säre et al., 2010), and the nine largest companies now control approximately 65% of the total Estonian catch. Four of these larger companies (Kalma Kaubandus OÜ, Kalma Kala OÜ, Empreste OÜ and Latikas OÜ) sell fish to Logi-F and are participating in this assessment.

Table 6: Number of companies and fishermen related to Lake Peipus, 2006-2013 (Source: Eschbaum et al. 2014).

	2006	2007	2008	2009	2010	2011	2012	2013
Companies	96	94	87	68	69	70	68	66
Fishermen	530	490	300	336	365	405	383	367

Stock assessments are performed jointly by researchers of Estonia and Russia; scientists provide advice on the total allowable catch (TAC) for the two northern lakes, and once agreed at the ERFC, the TACs are divided into two equal parts among two countries. In Estonia, the quota is divided into the first and second half of the year. Termination of fishing takes place when the total catch of all

companies approaches the half-year quota. In Estonia, individual quotas are absent, and a so-called Olympic system is used for management, when companies compete with each other, reporting catches on a daily basis.

Annual Estonian quotas in Lake Peipus are around 1,000 t of perch and 700 t of pike-perch (Table 7). Total Estonian catches in 2008–2015 have averaged 886 t perch and 594 t of pike-perch (Eschbaum et al. 2013, Eschbaum et al. 2014, http://www.agri.ee).

Table 7: Estonian national fishing quotas (t) on Lake Peipus, 2008-2016.
(Source: Eschbaum et al. 2013, Eschbaum et al. 2014; Protocol of the 41st ERFM 2015, http://www.agri.ee).

Species	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average
Pike-perch	1,000	600	546	672	714	650	650	650	725	690
Perch	820	850	1,200	900	1,400	1,000	800	850	1,000	980
Pike	95	85	70	110	160	165	120	125	115	116
Bream	700	570	460	600	614	650	750	710	725	642
Roach	475	330	330	305	300	280	350	275	300	327
Burbot	50	50	50	50	50	50	50	50	50	50
Ruff	300	300	300	300	300	150	150	150	150	233
Smelt	5	5	5	5	5	5	5	5	5	5
Whitefish	7	7	7	5	3	2	1	1	1	4
Vendace	1	1	1	10	15	15	25	15	15	11
Other	50	50	50	50	50	25	25	25	25	39
Total	3503	2848	3019	3007	3611	2992	2926	2856	3111	3097

Estonian companies usually take very close to the entire annual quota of the most valuable fish. For example for 2013-2015, on the whole the quotas were used up to the extent of 79-86%. The quotas of the four key species in several years were used up to the extent of 98-100% (Table 8). In Russia, individual quotas are allocated for companies, and very often quota is taken only partly because not all companies are able to take their quota due to capacity limitations. Because of this Russian companies have under-used their quota for a long time, but in the most recent years a larger proportion of the quota has been taken and now this proportion approaches three quarters of the TAC.

Fish caught from the lake are landed in nearly 40 Estonian ports. In 2015, the largest quantities were landed in Varnja (206 t), followed by Alajõe (183 t), Kallaste (176 t in two ports), Mehikoorma (173 t in two ports) and Lohusuu (154 t). Approximately 50–150 t of fish is landed annually in another dozen lakeside villages. The quantity of fish landed in the remaining small ports is less than 50 t per year (Figure 2).

Catch statistics for Lake Peipus are available from the 1930s, with the exception of a gap in the data during World War II. In the 1930s, about 1,500–1,300 t of smelt, which is represented in the lake by landlocked population maturating at age 1-2 years, were caught in the lake annually, with the largest catch (9,160 t) recorded in 1935 (Pihu & Kangur 2001). In the 1980s, the catch of smelt was 5,567 t, in 1998 – 2,966 t, between 2003 and 2006 – 117 t, and in 2006 only 83 t (Pihu & Kangur 2001, Krause & Palm 2008). Kangur et al. (2008, cited by Haberman et al. 2010) stressed that the cumulative effect of eutrophication and warming of the aquatic environment coupled with cyanobacterial blooms and siltation of spawning grounds are the main causes for the decline of clean, cold water fishes such as vendace and smelt.

Table 8: Estonian catch (t), quotas (t), uptake (%) and balance (t) of quotas for Lake Peipus for 2013-2015
(Source; Eschbaum et al., 2014; http://www.agri.ee).

Species	Year	Catch (t)	Quota (t)	Uptake (%)	Remaining Balance (t)
Pike-perch	*2013*	637	650	98	13
	2014	420	650	65	230
	2015	599	650	92	51
Perch	*2013*	914	1000	91	87
	2014	787	800	98	13
	2015	818	850	96	32
Pike	*2013*	143	165	87	22
	2014	94	125	75	31
	2015	120	120	100	0
Bream	*2013*	604	650	93	47
	2014	676	710	95	34
	2015	748	750	100	2
Roach	*2013*	185	280	66	95
	2014	211	275	77	64
	2015	217	350	62	133
Whitefish	*2013*	0	2	0	2
	2014	0	1	0	1
	2015	1	1	100	0
Smelt	*2013*	0	5	0	5
	2014	0	5	0	5
	2015	0	5	0	5
Vendace	*2013*	10	15	64	5
	2014	13	15	85	2
	2015	22	25	89	3
Burbot	*2013*	23	50	46	27
	2014	17	50	34	33
	2015	20	50	40	30
Ruffe	*2013*	2	150	1	148
	2014	4	150	3	146
	2015	2	150	1	148
Other	*2013*	3	25	12	22
	2014	4	25	17	21
	2015	4	25	17	21
Total	***2013***	**2520**	**2992**	**84**	**472**
	2014	**2256**	**2856**	**79**	**600**
	2015	**2521**	**2926**	**86**	**405**

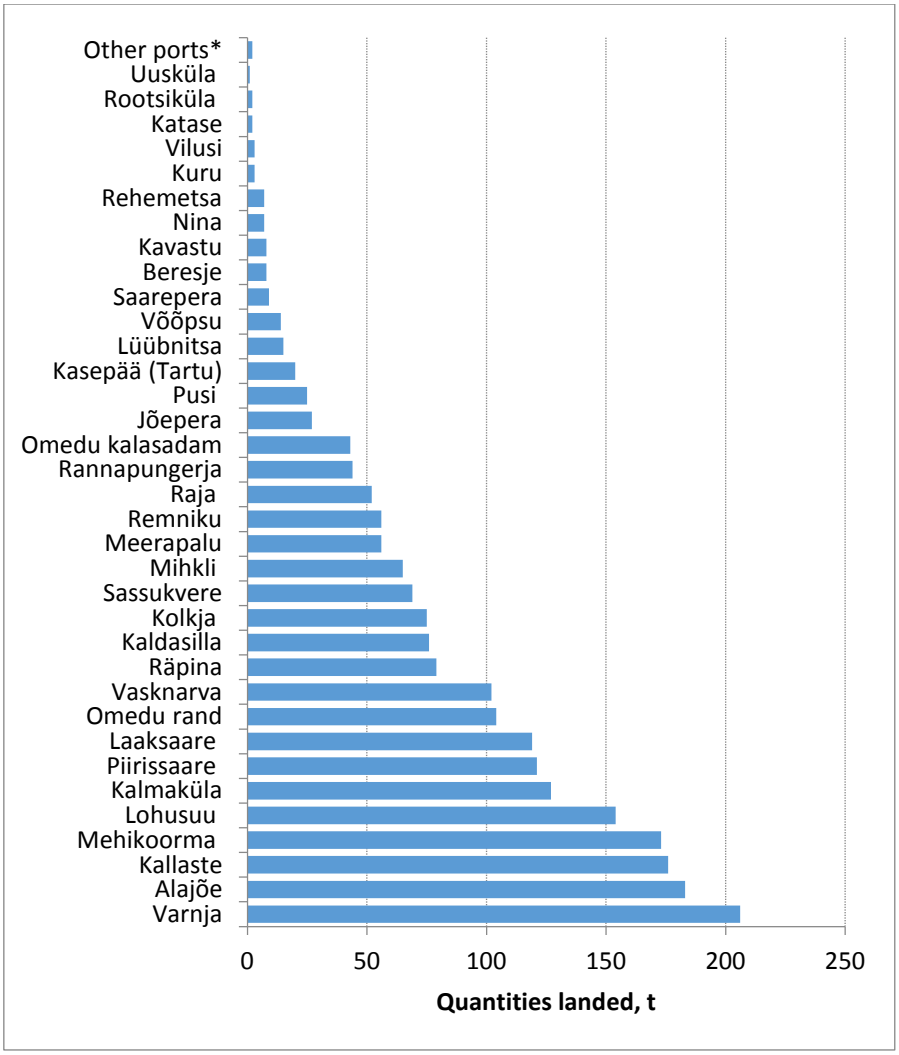

Figure 2: Fish landings (t) at Estonian ports of Lakes Peipus in 2015 (Source: http://www.agri.ee)
* Less than a tonne landed in each port. In descending order of importance: Ranna, Mustvee, Kauksi, Karjamaa, Kasepää Jõgeva.

In parallel with decline in vendace and smelt, the abundance of pike-perch has increased remarkably. Since the late 1950s to early 1980s, the pike-perch catch was on average only 15 t per year (<0.5% of the total annual catch in the lake). During the early 2000s, the annual catch of pike-perch ranged between 747 and 3,151 t per year, which is 30–40% of the total catch (Kangur et al. 2008, cited by Haberman et al. 2010). Therefore, the pike-perch stocks have increased in parallel with the eutrophication of the lake. It is generally known (Smith et al. 1998, cited by Haberman et al. 2010) that low water transparency is one of the main features of a lake with high productivity of pike-perch. However, the pike-perch fishery in Lake Peipus is quite intensive and, as a consequence, only a few year classes are represented in the recent period and the population has been dominated by juveniles (Haberman et al. 2010). The population status of pike-perch and it fisheries regime are matters of ongoing monitoring of the intergovernmental ERFC: the concern is due to the state of populations of other fish species in Lake Peipus and the pursuit of sustainable fisheries in the coming years (see Section 3.5 for detailed information). Perch, in general, followed the same trends as pike-perch, but their population currently has a somewhat better status than pike-perch. Long-term changes in composition of fish of different trophic groups of the Lake Peipus are presented in Figure 3.

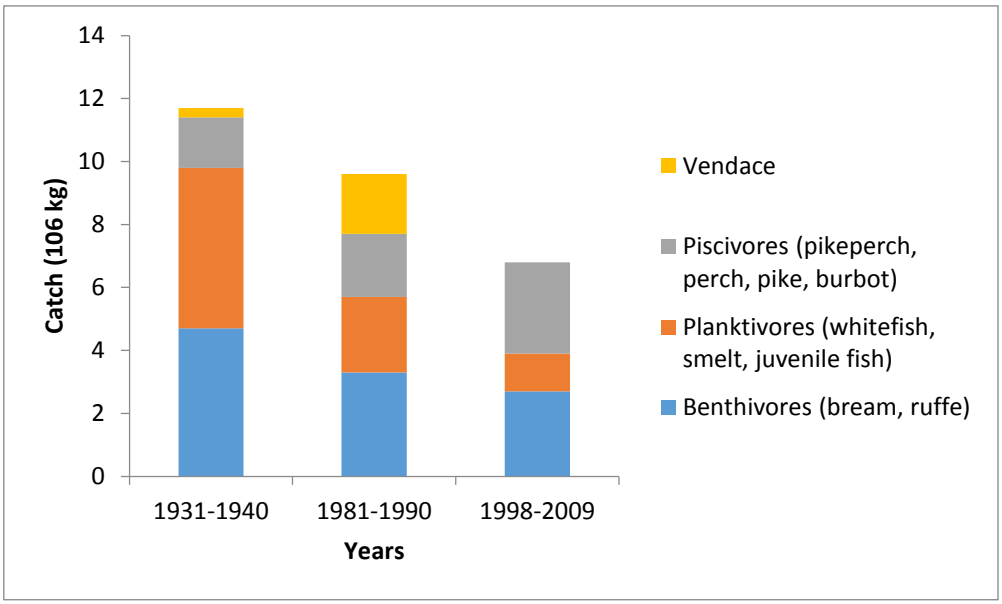

Figure 3: The proportion of different trophic groups of fish species in commercial catches from Lake Peipus (Estonia/Russia).
(Source: Kangur et al. 2013)

Today the lake supports a significant fishery, producing 85–88% of the total freshwater catch of fish in Estonia (Vetemaa et al., 1999, cited in Kangur et al. 2007). Perch and pike-perch are the most important species within the Lake Peipus fisheries, comprising more than 60% of total catch (see Table 5 and Figure 4).

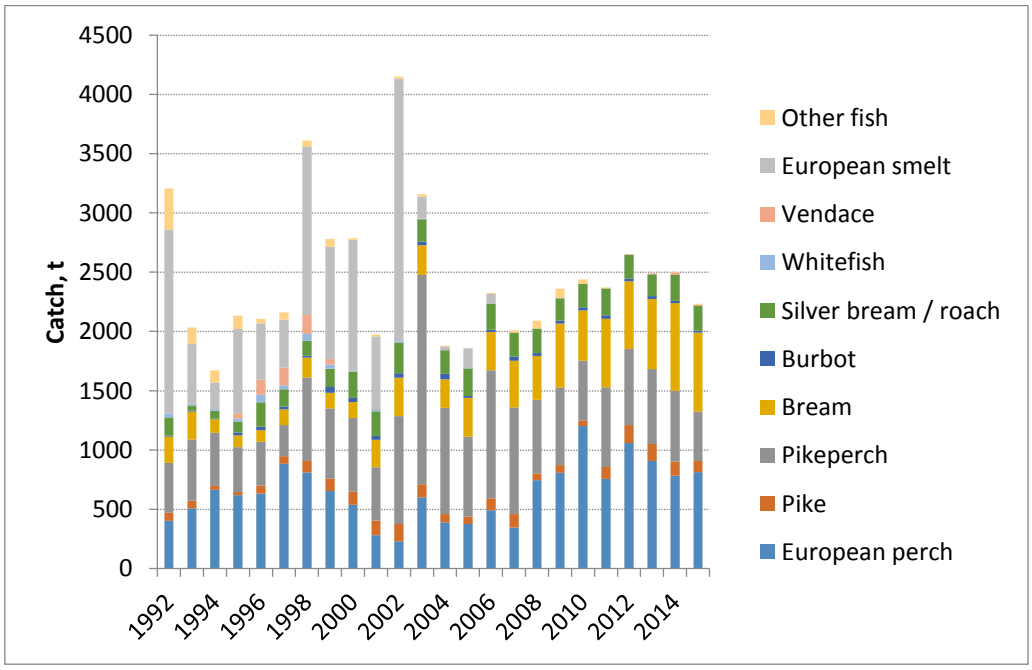

Figure 4: Landings (t) of key species in Lake Peipus over time.
(Source: http://pub.stat.ee/px-web.2001/Dialog/Saveshow.asp)

3.4.2 Vessel and gear description

A variety of different fishing gears are used on Lake Peipus (Table 9); their use depends on season, target species, and type of fishing (commercial or recreational).

Table 9: Fishing gears used on Lake Peipus.

(Source: Säre et al., 2010).

Season	Commercial fisheries	Recreational/subsistence fishers
Winter	Large-mesh gill nets under ice	Ice fishing (angling)
Spring	Trap nets; small-mesh gill nets	Gill nets, trap nets and hook and line
Summer	Trap nets	Gill nets, trap nets and hook and line
Autumn	Danish seine; large-mesh gill nets	Gill nets and hook and line

In recent years, the permitted fishing capacity has remained at the same level. For example, for the Estonian side, in 2013, the use of up to 20 Danish seines and up to 3,000 large-mesh gill nets with a length of 70 m has been agreed at the ERFC. The contribution of different gears to the total commercial catch varies from species to species. In 2013, the biggest quantities were caught using large-mesh gill nets, but the total annual catch taken with trap nets and lines of trap nets was much higher (see details in the following chapters).

Figure 5: Typical modern Estonian fishing vessel of Lake Peipus.

Information on fleet structure operating at Lake Peipus is provided following to Eschbaum et al. (2012). As at 1 July 2011, 318 fishing boats were registered in the Estonian Fishing Vessel Register. Their construction years ranged from 1951–2008. Most of them were older than 10 years (276 boats); the number of vessels ≤10 years was just 42. While older vessels were mainly wooden (114 vessels) or metal (117 vessels), the main building material of newer vessels was fibreglass/plastic (24

vessels). The latter included new demersal seine boats (12 vessels) and trap net boats (5 vessels). More than 90% of the fishing vessels used on Lake Peipus (including all of the newer ones) were up to 12 m in length and with a gross tonnage of less than 10 t. The capacity of main engines was up to 220 kW, but engines with a capacity of 40–60 kW are more common (Figure 5).

The main commercial fishing gears on Lake Peipus are small-mesh gillnets, large-mesh gillnets, trapnets, line of traps, and Danish seines. Pike-perch trapnets are used mainly in Lake Peipsi, at least 5 km from shore, with wings of 200 m and with two traps, one on either size of a leader. The lines of traps are up to 700 m long, use bigger mesh sizes and are fitted with up to 30-40 traps; these are used mainly in Lake Lämmijärv because of the water current regime in this area.

3.4.3 User rights

In Estonia, the Ministry of Environment states that (i) the definitions, rights and obligations of commercial fishermen and recreational fishermen have been structured according to the national legislation and that (ii) traditional fishing opportunities have been consolidated and enlarged for Estonian fishermen (MoE 2016).

Fishing opportunities (e.g., in the form of gear-specific permits) are allocated according to historical rights. These are handed down through families or can be sold on the open market. It was observed that, because of the link to historical rights, it can be difficult for new entrants to join the fishery as a licensee but it was easier to join a fishing company and operate under their license (Andrey Ulukhaniyants, pers. comm., 17 October 2016). There are a number of ethnic minorities around the lake – most specifically the Setu and the 'Russian Old Believers'. It is not believed that they are discriminated in any way in terms of access to fishing rights (Margit Sare, pers. comm., 19 October 2016).

3.4.4 Management structure

In Estonia the responsibility for fisheries management is divided between two bodies, the *Ministry of Rural Affairs* (MoRA) and the *Ministry of the Environment* (MoE), whose respective roles are clearly spelled out in the Fishing Act (2015). The MoRA is responsible for the broad governance of the sector (e.g., registration of vessels, catch accounting and commercial fisheries licensing) whilst the MoE is responsible for the day to day management of these fisheries.

Russian fisheries management is organized through a common coordinating agency, the *Federal Fisheries Agency* (FFA, or Rosrybolovstvo), which has operated with executive power since May 2012 under the Russian Ministry of Agriculture. The FFA administers federal law and policy on fisheries on a region-by-region basis by means of 18 territorial branches. In the case of Pskov region the responsibilities of the FFA are organized via the North-west territorial branch. The *Ministry of Natural Resources* (RosPrirodNadzor) conducts an independent review of the annual TACs via the State Ecological Expertise. The *State Research Institute of Lake and River Fisheries* (GosNIORH) is also a key research institution covering fishes in Northwest Russia, including Lake Peipus.

The management regime on Lake Peipus is centred around the workings of the ERFC. Formed in 1994, it provides a forum for Estonian and Russian managers to discuss and agree fisheries output controls in the form of total allowable catches (TACs), input control in the form of a number of allowable fishing gear units and the setting of fisheries technical measures applicable to the lake. This is an annual process, with a formal protocol being issued in December and the revised management regime starting in the following January. The process is highly inclusive on the Estonian side, with the MoE and MoRA and fisheries associations both working within a Fisheries Council that formulates the Estonian position on stocks and their management needs. There is a similar process on the Russian side with the FFA and GosNIORH, followed by a review by the State Ecological Expertise.

3.5 Principle One: Target Species Background

3.5.1 Perch – *Perca fluviatilis*

European perch (Figure 6) has a very wide distribution in Northern Asia and in Europe, excluding the very north and some southern parts of the continent. Moreover, this species has been introduced in many regions of north America, and to Asia east from its native range, as well as to Australia, New Zealand and South Africa (Figure 7). European perch is considered to be a common fish in lakes and rivers of northern Europe and northern Russia.

Figure 6: European or common perch *Perca fluviatilis*
(Source: Reshetnikov et al. 2003)

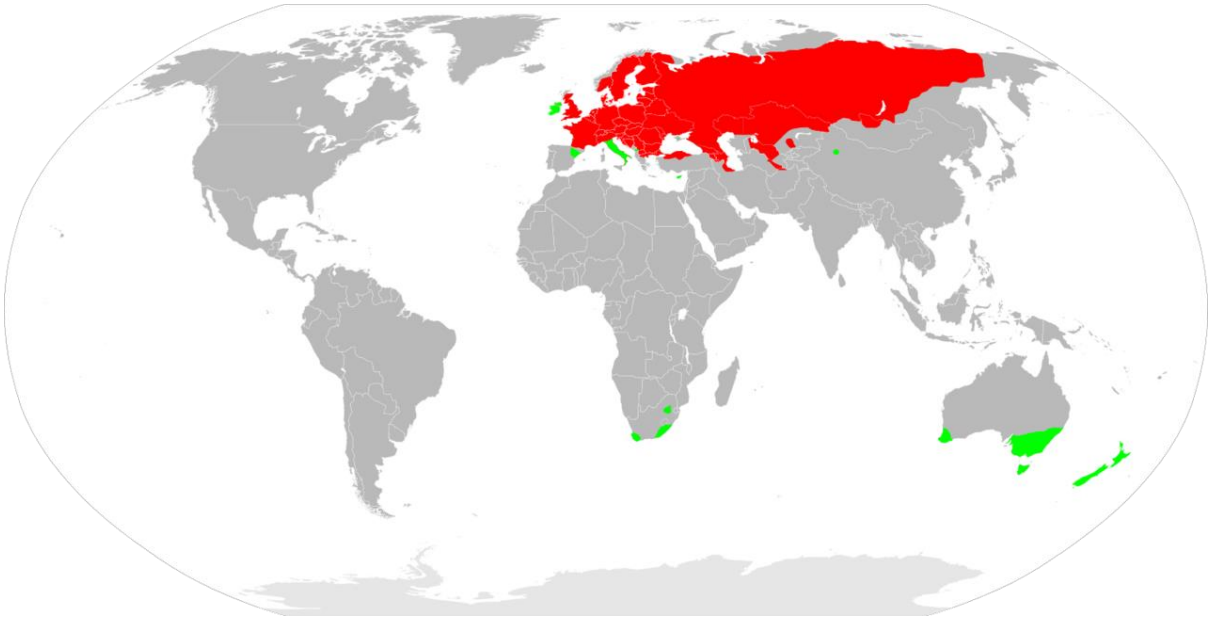

Figure 7: **Perch distribution in the world. Red – native range, green – introduced range.**
(Source: https://en.wikipedia.org/wiki/European_perch)

Perch live under a very wide range of habitats – estuaries, lakes of all types, medium-sized streams and large rivers. Perch live up to 22 years of age and attain a maximum size of 60 cm and 3 kg of body weight. Males usually attain first sexual maturity at 1-2 years and females at 2-4 years of age. Spawning takes place in February-July at temperature from 7 to 15°C. Eggs (diameter about 3.5 mm) are grouped in long white ribbons (up to 1m) and are found over submerged objects. Fecundity depends on size of female and varies from 12,000 - 900,000 eggs.

During the first year, young perch live in coastal vegetation and eat zooplankton. Perch usually start to predate at 10 cm body length, but some individuals at size 4 cm. Perch perform small migrations to spawning and feeding locations. In particularly, in large lakes and reservoirs, perch enter tributaries for spawning and then return to larger water bodies for feeding. They actively prey on juvenile fish including their own species. Perch may eat almost 5 kg of other fish to gain 1 kg of body mass. Perch is also preyed upon by fish species including wels catfish, pike, pike-perch and burbot, as well as birds including osprey, seagulls, tern and cormorants.

3.5.2 Perch in Lake Peipus

3.5.2.1 Perch distribution

In Estonian waters, perch is one of the most widespread and, in most cases, abundant fish species. Two ecological perch forms are sometimes distinguished in Estonian lakes (Shirkova 1966a and Haberman 1968, these and further references from this section are cited by Pihu et al. 2003). The smaller, slower-growing form (reed or littoral perch) lives in the littoral zone of lakes; their coloration is relatively dark and fins are bright red; this form feeds mainly on zoobenthos. The bigger, faster-growing form (lake or pelagic perch) usually occurs in the open part of lakes, they are of a dull colour and consume mostly small fish (Pihu et al. 2003). According to the data of Estonian ichthyologists, who have been studying the lake for a long time, there is no inheritable differentiation of perch at two ecological forms on the Lake Peipus (V. Vaino, pers. comm.).

Perch is rather sedentary, it usually lives in shoals which may include individuals of different size. Big individuals become solitary (Pihu et al. 2003).

3.5.2.2 Perch reproduction

In large Estonian lakes, male perch become sexually mature mainly at the age of 3-4 years (Sl 9-14 cm), females a year later (12-18 cm) (Pihu 1959 and Frantova 1975, both cited by Pihu et al. 2003). Perch spawning grounds are located over almost the entire length of the Lake Pihkva coast, but the southern part of the lake is considered to be the most favourable area. Perch also spawn in the entire shallow water area of Lake Peipus where aquatic vegetation is present, but again especially in the southern part of the lake.

Perch can spawn on sand and pebbles as well as on plant substrate, and may spawn in the sloping areas where trapnets are installed during smelt spawning period. Spawning of perch begins at a water temperature of 6-8 °C and occurs in the second half of April at water temperatures of 8-11°C and lasts from 6 to 8 days (Table 10). According to other data, perch spawning typically lasts 2-3 weeks, until the middle of May (Pihu et al. 2003).

In lakes Peipus and Aheru the fecundity of perch is lower than in Lake Võrtsjärv and in the Neva Inlet, particularly in smaller specimens. In general, adult fecundity increases with fish length, weight and age. In Lake Peipus, adult fecundity of perch increases from 6,500 (Sl 12-14 cm) to 77,600 (Sl 30-32 cm). Relative fecundity of smaller perch (Sl < 18 cm) is usually higher than that of bigger ones (Pihu & Pihu 1974a).

Table 10: Spawning periods of the main commercial fish species in Lake Peipus (average data of 1989-2006).
(Source: Melnik 2007)

Fish species	Range in spawning period	Average date of start of spawning period	Average duration of spawning period (days)
Perch *Perca fluviatilis*	17.04-20.05	26.04	7
Pike-perch *Sander lucioperca*	10.05-10.06	15.05	15
Bream *Abramis brama*	05.05-17.06	13.05	21
Roach *Rutilus rutilus*	13.04-13.05	24.04	8
Pike *Esox lucius*	10.04-20.05	20.04	21
Smelt *Osmerus eperlanus*	29.03-10.05	19.04	12

The eggs of perch are covered with a relatively thick mucus layer, which swells in water; they are laid in a long net-like tubular band on macrophytes, twigs, stones or any obstruction in water. The incubation period lasts 16-18 days at a water temperature of up to 12 °C (Lebedeva & Meshkov 1969). The newly hatched yolk sac larvae have a total length of 5-7 mm, their yolk sac is relatively small and light (Kovalev 1985; M. Vetemaa, unpubl. data cited by Pihu et al. 2003). The prelarvae live separately on the bottom for some days, after which they form shoals and begin an active life (Pihu et al. 2003).

3.5.2.3 Perch feeding

In Lake Peipus, perch larvae of 6.5-10 mm feed mainly on Copepoda (young stages, *Cyclops, Mesocyclops* a.o.); Cladocera (*Daphnia, Bosmina, Limnosida* etc.) dominate the diet of bigger larvae (Zaripova & Kozlov, 1985). By June of the first year, perch fry of >1.8 cm begin to swallow larvae of roach, white bream and perch itself; larvae of water insects (mainly Chironomidae) and other bottom invertebrates are also consumed (Antipova, 1985). The main food of perch in their first and partially in the second year of life in Estonian large lakes is zooplankton, while zoobenthos is of less importance (Pahkla 1958, Haberman 1963, Pihu 1964, Pihu & Pihu, 1974a, Kangur & Tylp 1974). Older perch is a typical predator, eating mainly smelt, ruffe, young perch and roach (Pihu 1964, Pihu 1966, Shirokova 1966a, Kangur 1969, Antipova & Kontsevaya 1994). Cannibalism is common (particularly for the specimens of >20 cm). The role of commercially valuable fishes (e.g. pike-perch, bream, vendace) in the diet of perch is insignificant.

Young perch of <12-13 cm consume eggs of other fishes on their spawning grounds; in Lake Peipus eggs of smelt, roach and ruffe (Shirokova 1966a; Pihu & Pihu 1974a, Popova 1975). Perch usually feed most intensively in summer (Kangur & Tylp 1974), but in Lake Peipus feeding intensity is highest in spring during the smelt spawning period (Pihu & Pihu 1974a). Perch continue to feed In winter, although at lower intensity.

Perch is an important prey item for predators; it is a main prey of pike and burbot, while it is somewhat less important in the diet of pike-perch and perch itself (Kangur 1969, Pihu & Kangur 1970, Pihu & Pihu 1974a, all cited by Pihu et al. 2003).

3.5.2.4 Perch growth and age

The age of perch has been determined from scales and opercula (Saat & Eschbaum 1995, cited by Pihu et al. 2003). In Lake Peipus, littoral perch grow slower and have a shorter lifespan than exhibited by pelagic perch (Shirkova 1966a, Kangur 1974, both cited by Pihu et al. 2003). It is shown that the growth rate of perch in Lake Peipus is one of the highest among all Estonian water bodies (Shirokova 1966a; Kangur 1974; R. Eschbaum & T. Saat unpubl. Data, V. Vaino unpubl. data, all cited

by Pihu et al., 2003). The largest perch caught in Estonia was reportedly a fish of 2.8 kg; this fish was taken in Lake Peipsi in 1961 (Pihu et al. 2003).

3.5.2.5 Perch fisheries

In Estonian waters, perch is one of the most widespread and, in most cases, abundant fish species. In Lake Peipus, the total annual catch of perch (>12-15 cm) has usually been around 1,000-1,700 t (3,910 t in 1973, of which 500-1,200 t was taken by Estonian fishermen) (Pihu et al. 2003). The perch stock in Lake Peipus declined over the late 1990s-early 2000s, but has increased steadily over the last 15 years, which is reflected in improved harvests. Estonian perch catches in Lake Peipus have ranged from 229 t in 2002 to 1,200 t in 2010, with Russian catches following a similar trend (Figure 8).

In terms of catches, perch has been the number one target species in recent period 2008-2015 both in Estonia (average annual catch of 886 t) and throughout the lake (average catch of 1,556 t) (Eschbaum et al. 2012, Eschbaum et al. 2013, Eschbaum et al. 2014; http://www.agri.ee).

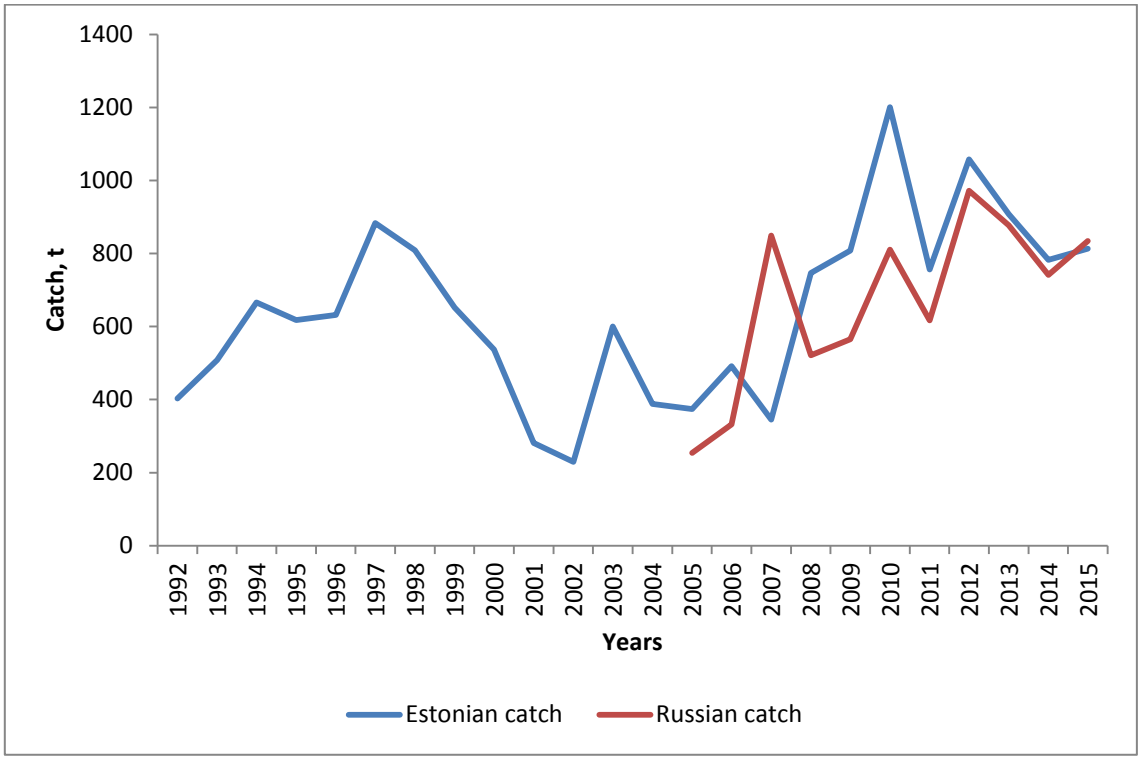

Figure 8: Estonian (1992-2015) and Russian (2005-2015) catches of perch (in tons) in Lake Peipsi (Sources: http://pub.stat.ee/px-web.2001/Dialog/Saveshow.asp, http://www.agri.ee, http://priroda.pskov.ru/vidy-deyatelnosti/vidy-deyatelnosti/rybnyy-promysel-vodnye-bioresursy).

The catches of perch in 2014 and 2015 were at the average levels of recent years (see Table 5). Changes are primarily due to stock (pike and vendace) or interest in fishing (ruffe and other species). As usual, the highest catches were taken in September, when 824 tonnes in 2014 and 562 tonnes in 2015 were landed (Figure 9 and Figure 10).

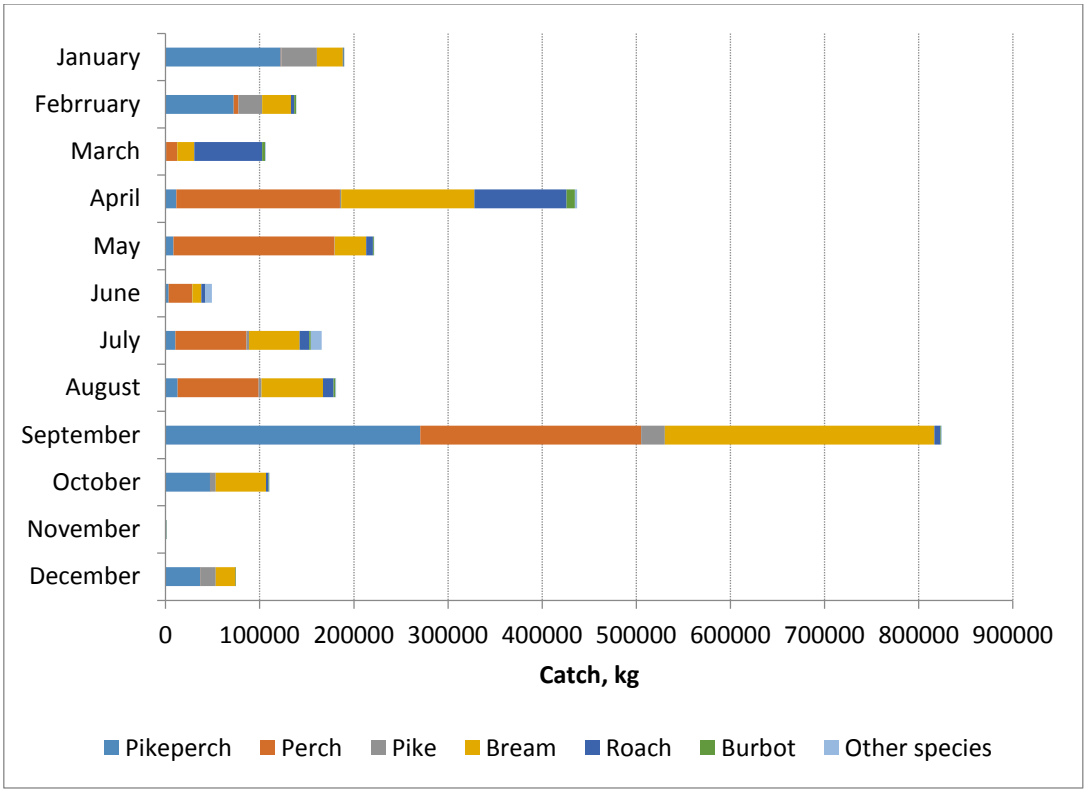

Figure 9: Temporal dynamics of catches from Lake Peipus by species in 2014.

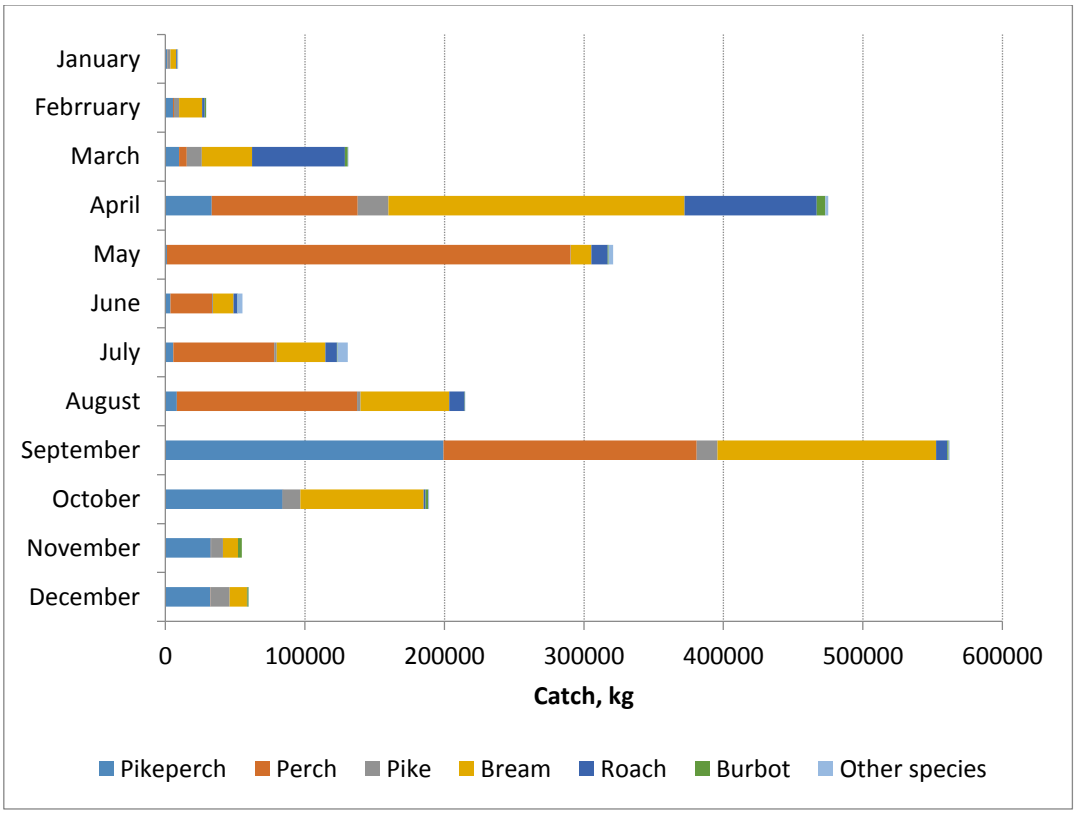

Figure 10: Temporal dynamics of catches from Lake Peipus by species in 2015.

The compositions of catches in Lake Peipus by species by different gear types in 2014 and 2015 are shown in Figure 11 and Figure 12. In 2014 and 2015 all the key types of fishing gears were used on the lake. The biggest quantities in both years were caught using large-mesh gill nets, trap nets and lines of trap nets.

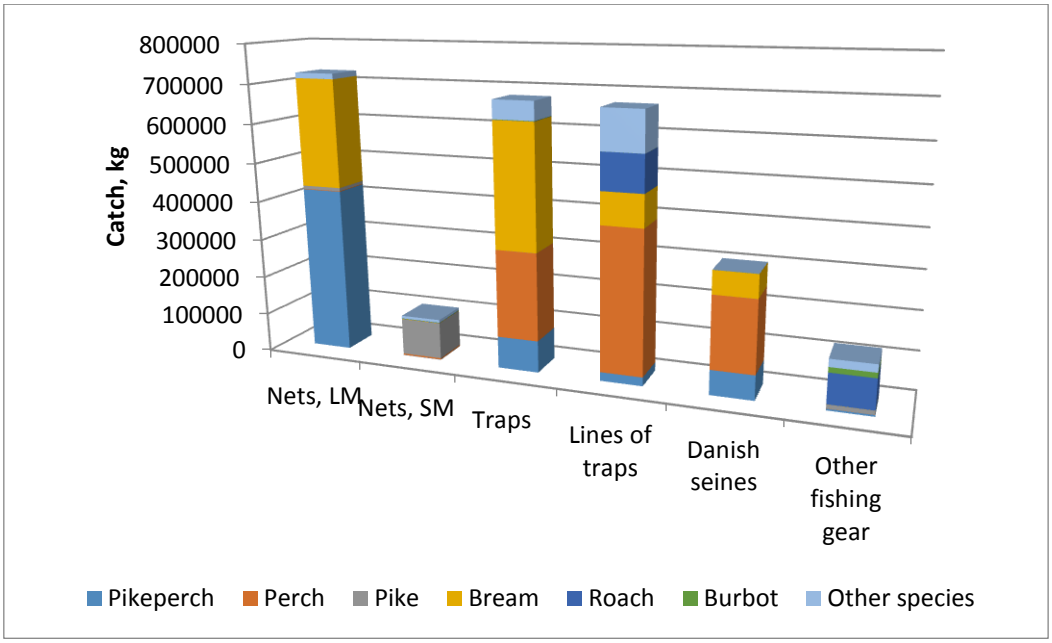

Figure 11: Estonian catches (kg) from Lake Peipus in 2014 (without research fishing). LM – large-mesh; SM – small-mesh; Traps including both shallow and open water traps; Other fishing gears – purse seine, driftnet and long line (100 hooks).

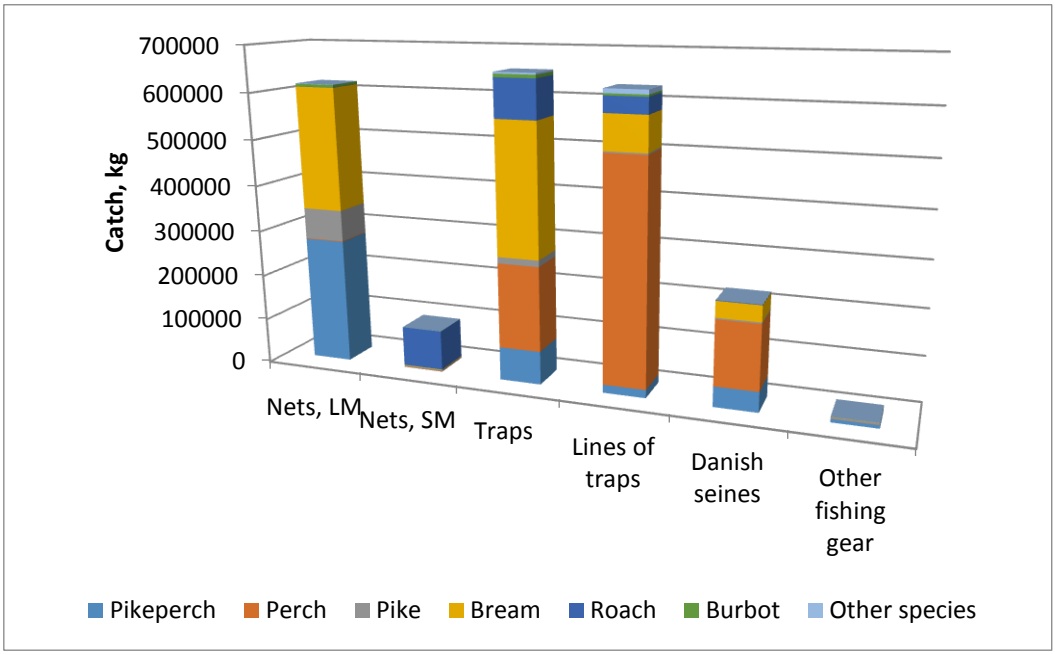

Figure 12: Estonian catches (kg) from Lake Peipus in 2015 (without research fishing). LM – large-mesh; SM – small-mesh; Traps including both shallow and open water traps; Other fishing gears – driftnet and long line (100 hooks).

The biggest quantities of perch were caught with lines of trap nets. In 2014 and 2015 trap nets and Danish seines gave roughly the equal number of landed perch. It should be noted that in 2013 the harvest of perch caught by traps and Danish seines was approximately two times larger each than catch with lines of traps (Eschbaum et al. 2014).

Detailed data on catches of perch and other species are available from the website of Ministry of Agriculture (http://www.agri.ee). This website also reports about daily catch statistics with a delay of 2-3 days.

The meeting of the ERFC in November 2016 reported that stock status of perch is now at a high level. In 2015, an extremely productive generation of perch appeared in Lake Peipus. Thus, the basis of stock and catches of perch in 2017 will account for fish generation of 2015 and the remainder fish of abundant generation 2012 (ERFC 2016).

Table 11: Perch abundance and weight (number of individuals and kg per trawling hour) based on trawl fishery on Lake Peipsi from 2008–2012 (the numbers in bold and italic indicate the abundance of the year classes 2005 and 2009, respectively).
(Source: Eschbaum et al., 2013).

Survey year	Abundance/age group						
	1+	**2+**	**3+**	**4+**	**>4+**	Total number	Total weight, kg
2008	2	0	**1267**	12	3	1284	81
2009	7	7	0	**812**	14	840	79
2010	*4 422*	46	4	4	**546**	5022	178
2011	1	*1715*	32	0	253	2001	104
2012	0	0	*1318*	14	55	1387	90

3.5.3 Pike-perch - *Sander lucioperca*

Pike-perch is a large, freshwater percid species (Figure 13). The natural range of pike-perch extends from the Urals and the Aral Sea in the east to the Elbe River and Southeast Norway in the west (Figure 14). In the south, its area reaches the Caspian and the Black seas and the Marica River on the Balkan Peninsula. Originally, it was absent in Italy, France and England. In the north, the area of pike-perch reaches the polar circle, in Lake Kemi (Finland) it occurs even at higher latitudes. In the Baltic Sea, pike-perch typically inhabit low salinity bays.

In recent times, the range of pike-perch has widened considerably – it has been introduced to the Rhine catchment and to England (Maitland & Campbell 1992), France (Wurtz-Arlet 1962), Turkey, Denmark (Dahl 1962), central Asia and West Siberia (lakes Issyk-Kul, Balkhash, Hanka, the Novosibirsk Reservoir, etc.).

Figure 13: Pike-perch, *Sander lucioperca.*
(Source: Reshetnikov 2003)

Figure 14: Natural range of pike-perch
(Source: Lajus et al. 2009).

3.5.4 Pike-perch in Lake Peipus

3.5.4.1 Pike-perch distribution

In Estonia, pike-perch inhabit the Gulf of Riga, the Väinameri and Narva Bay, and occasionally it occurs in coastal waters of other regions. In fresh water, it occurs in lakes Võrtsjärv and Peipus from where it occasionally migrates into the Emajõgi River, smaller lakes and the Narva Reservoir. Since the end of the 19th century, pike-perch has been successfully introduced into more than 30 moraine lakes in south-eastern and southern Estonia.

The most suitable inland water bodies for pike-perch are warm, oxygen-rich (> 5 mg O_2 l^{-1}) eutrophic lakes with a surface area >50 ha, with scarce vegetation, slow current, moderate depth, low water transparency and stony or sandy bottoms. Abundant plankton (primarily *Leptodora kindti*) and a

smelt population characterize good pike-perch lakes. Pike-perch can tolerate moderate pollution (Erm et al. 2003). Thus, the current habitat conditions in Lake Peipus to a large degree satisfy the requirements of pike-perch.

3.5.4.2 Pike-perch reproduction.

Pike-perch attain sexual maturity at the age of 3-5 years (males at 3-4, females at 4-5 years). In Lake Peipus, males attain sexual maturity usually at the age of 4 years, females at the age of 5 years. However, in the second half of the 1990s when several very strong and fast-growing year-classes appeared, a noteworthy proportion of both males and females spawned a year earlier (at the age of 3 and 4 years, respectively) (Erm et al. 2003). The standard length of the smallest mature male from the Lake Peipsi was 29 cm and of the female 33 cm (Shirokova 1966b). Data on fecundity indicate that adult fecundity of pike-perch in Lake Peipus and Pärnu Bay is higher than in Lake Võrtsjärv, Matsalu Bay or the Gulf of Finland.

Adult fecundity of pike-perch increases with fish length, weight and age. In Lake Peipus, adult fecundity increases from 129,100 (at 39 cm) to 563,840 (at 49 cm). Relative fecundity of pike-perch in Lake Peipus also increases with fish length, weight and age (V. Vaino, unpubl. Data, cited by Erm et al. 2003).

$$\text{Adult fecundity} = 0.2524^{\,e0.157\,Si}, \text{ where } r^2 = 0.953, \text{ number of length groups } n = 7.$$

$$\text{Adult fecundity} = 417.34\ Tw - 310{,}666, \text{ where } r^2 = 0.986, \text{ number of weight groups } n = 8$$

$$\text{Adult fecundity} = 184{,}041\ Age - 614{,}608, \text{ where } r^2 = 0.829, \text{ age 4-8 years.}$$

Pike-perch in Lake Peipus spawn for 2-3 weeks when the water temperature reaches 12-14 ^{0}C in May and early June. Pike-perch appear on spawning grounds shortly (2-3 days) after ice break up, in late April – early May. The mean long-term pike-perch spawning period in Lake Peipsi is around mid-May, which is 5-10 days later than in Lake Pihkva (see Table 10). When water temperature drops (as in spring 1999), the spawning period may last over a month. No spawning occurs at water temperature <10 ^{0}C and >20-21 ^{0}C (V. Vaino, unpubl. data, cited by Erm et al. 2003).

Pike-perch lay eggs in depressions of clean sandy or stony bottom. Spawning grounds in Lake Peipsi are located in the southern part (Pedasplya, Raskopelye Bay, Samolvinskaya Bay, around the villages of Podborovje, Ostrovitsi, Kunest and the Island of Piirisaar). In Lake Pihkva, pike-perch spawning grounds were found in the Velikaya River fore delta, in the southwestern and northern-eastern parts of the lake. Pike-perch spawning grounds can also be found in Lake Lämmijärv.

In Lake Peipsi, female pike-perch are usually more abundant on spawning grounds than males before spawning and at the beginning of spawning; the proportion of females declines thereafter. Spawning takes place usually at sunrise and requires a rather short time. Males remain in the spawning places to guard the eggs. The yolk-sac larvae hatch in ~ 10 days at 15 ^{0}C, and 3-4 days at 18-20 ^{0}C (Woynarovich 1962). The length of newly hatched, unpigmented prelarvae is 3.9-4.5 mm (Erm 1961). The prelarvae have a positive phototaxis: they rush spirally upwards and then sink passively to the bottom, taking advantage of better oxygen conditions for breathing. After the formation of the swim bladder the larvae start swimming horizontally (Erm et al. 2003).

Analysis of the dynamics of pike-perch recruitment indicates that the increase in its biomass is related to the appearance of several strong age classes (Figure 15a). It is noteworthy that strong year class formation is not correlated with the biomass of the spawning stock (Figure 15b). For example, from the strong 1991 pike-perch generation was produced by the highest observed spawning stock biomass, whereas the generations of 2001 and 2002 were produced by spawning stock with a biomass close to the minimal level. This indicates that pike-perch dynamics in lake Peipus are controlled by external factors creating favourable conditions for the spawning and survival of juveniles rather than by intrapopulation mechanisms (Bobyrev et el. 2013).

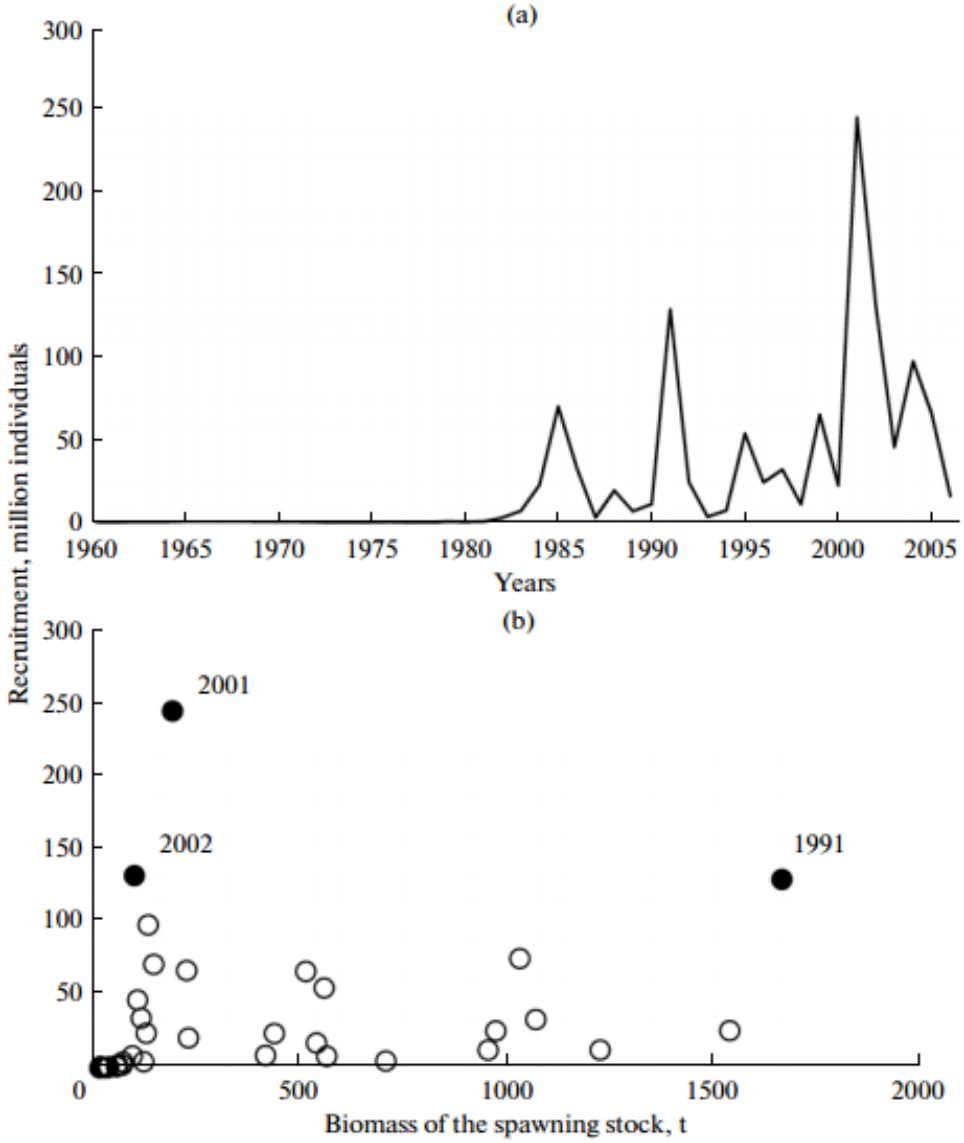

Figure 15: (a) Dynamics of recruitment (of the numbers of age group 0+) of the population of pike-perch; (b) the ratio between the spawning stock and the recruitment
(Source: Bobyrev et al. 2013).

3.5.4.3 Pike-perch feeding

Pike-perch larvae start exogenous feeding on the 3rd or 4th day after hatching, when two thirds of the oil globule in the yolk sac is used up. The first food consists of Copepoda nauplii and small Cladocera. From the 20th-26th day of exogenous feeding they begin to prey on the fry of other fishes. If food shortages occur, the larvae develop cannibalistic tendencies (Woynarovich 1962).

In Lake Pihkva, one-summer-old pike-perch of 4.0-4.3 cm length prey on 2.0-2.7-cm long dwarf smelt and, additionally, *Leptodora*, *Bythotrephes* and *Bosmina* water fleas. Invertebrates occur in the food of pike-perch up to 9 cm length (Pihu & Pihu 1979). According to estimations, pike-perch in Lake Pihkva in 1995 consumed 3,340 t of fish, including 1,303 t of perch, 979 t of ruffe, 576 t of smelt, 368 t of roach and 75 t of pike-perch juveniles (Sazonova et al. 2001, cited by Kangur et al. 2012). In 2006, food supply for pike-perch juveniles considerably decreased because of a very strong 2005 year-class (Vaino 2006, cited by Kangur et al. 2012). About a quarter of this generation therefore

continued feeding on zooplankton even in age 1+, and the larger pike-perch were able to feed on smaller pike-perch.

Smelt and vendace dominated the food of pike-perch in Lake Peipus in the 1960s-70s; in offshore waters bleak, roach, perch and ruffe was also consumed. As the vendace stock collapsed, starting in the 1990s, pike-perch preyed increasingly on smelt, followed by ruffe, perch and other species (Kangur 2000; V. Vaino et al., unpubl. data cited by Erm et al. 2003).

3.5.4.4 Pike-perch growth and age

In Estonian waters the growth rate of pike-perch is the highest in lakes Peipsi (Shirokova, 1966b) and Võrtsjärv (A. Järvalt, unpubl. data cited by Erm et al., 2003). In brackish water and in small lakes its growth (especially the growth in weight) is slower (Figure 16).

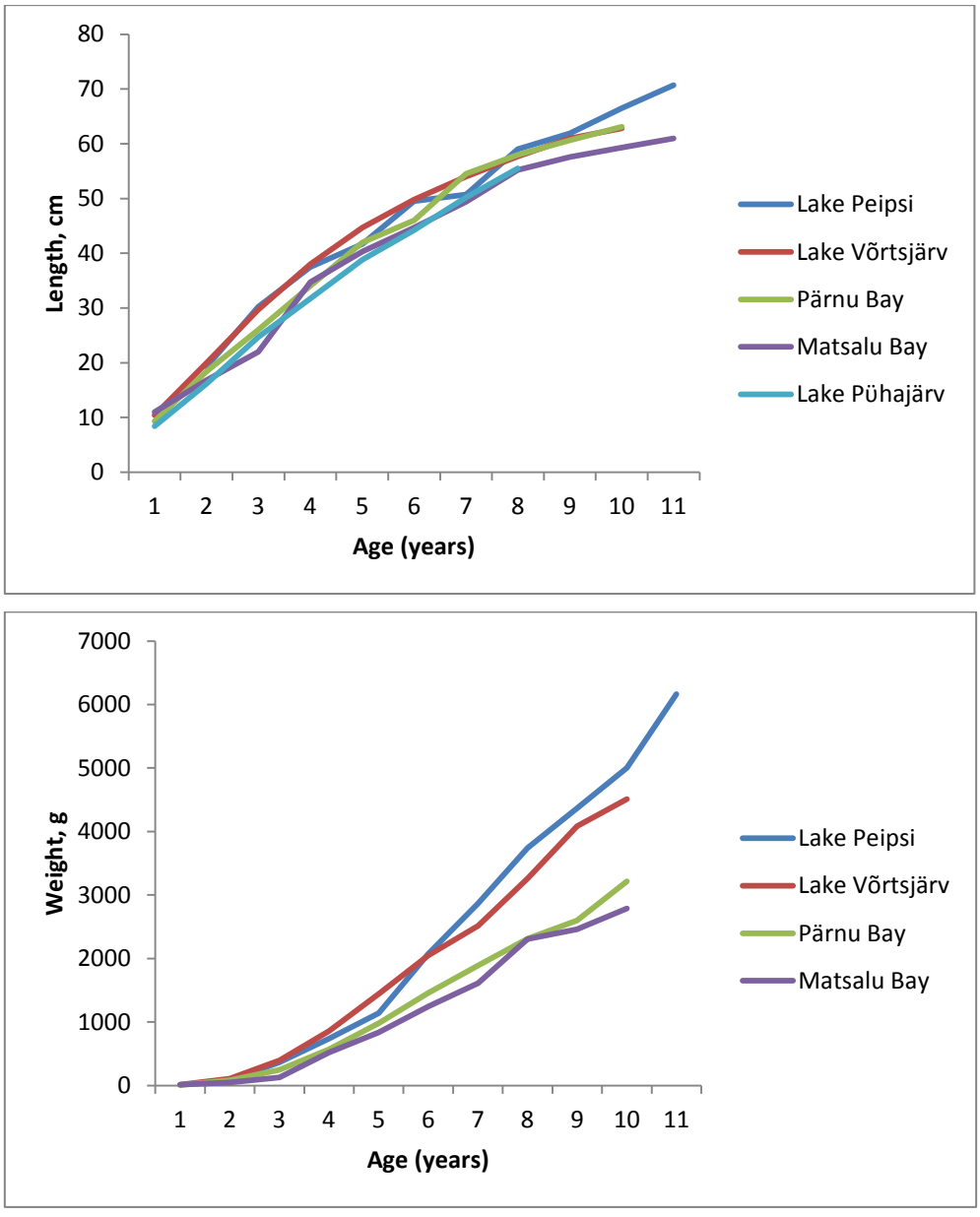

Figure 16: The growth rate of pike-perch by length (cm, upper picture) and weight (g., lower picture) in different Estonian water bodies.
(Source: based on original data by Erm et al. 2003)

Predatory pike-perch achieve rapid growth, and typically reach a body length of 28 cm and a weight of 173 g in end of the second summer, whereas pike-perch preying on plankton reach only 17 cm and 28 g by that time (Vaino 2006, cited by Kangur et al. 2012), which is more typical for fingerlings than for yearlings of pike-perch in Lake Peipus.

The largest pike-perch taken in Lake Peipus was caught in the winter of 1955, and weighed 12 kg. FC (Fulton's coefficient of condition per Sl) of adult fish in spring in Peipsi Lake is 1.8 (1.4-2.2); CIC (Clark's coefficient of condition per gutted weight – without internal organs) is 1.2 (1.1-1.8) (Erm et al., 2003)

Among spawners, fish of younger generations (4-7 years old) dominate, and older age groups tend to be rare due to fishing pressure (Vaino et al. 2001). The species reach the commercial size of 40 cm at age 3+.

3.5.4.5 Pike-perch fisheries

Catch records for Lake Peipus are available for about one century, during which considerable changes occurred. In the 1930s and 1950s, annual pike-perch catches comprised only 40-420 t (mean 197 t), or up to 2% of the total annual fish catch in Lake Peipus. Large resources of valuable fish, especially pike-perch and bream, were over-exploited subsequently through intensive trawling. In the late 1950s, fishing of pike-perch by trawls was terminated, but trawls were replaced by a special gear, called 'mutnik' in Russian (механический мутник), which was similar in design to a Danish seine; this allowed strong fishing pressure to be maintained. Thereafter, pike-perch catches in Lake Peipus were insignificant from the late 1950s to early 1990s, with average catches of just 15 t per year (0.5% of total annual fish catch) (Figure 17).

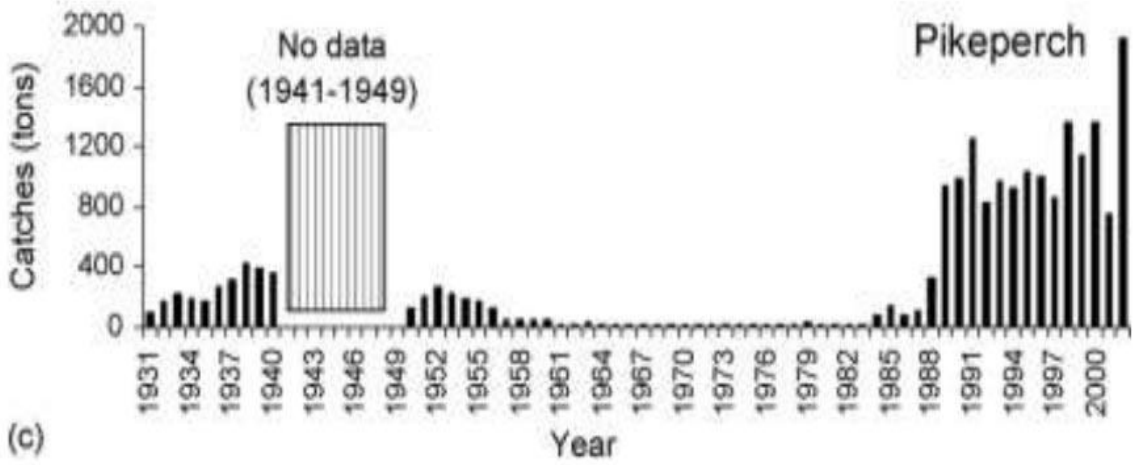

Figure 17: Landings of pike-perch catch in Lake Peipsi during period 1931-2002. (Source: Kangur et al., 2007)

Since 1974, along with the decrease in the number of Danish seines on the lake due to fishing regulations, mesh size in the purse of Danish seines was increased from 8-12 mm to 20-22 mm. In recent years, Danish seines were also limited and the number in use on Lake Peipus has been restricted to 20 for both Estonia and Russia, with not more 700 seine-days per year in total. As a result of these regulations, together with recent environmental warming and eutrophication of Lake Peipus that has supported the development of a number of strong pike-perch year classes (Vaino et al. 2001, cited in Kangur et al. 2012) the pike-perch stock has increased considerably (Figure 17). During the period 2008-2015 Estonian commercial catches of pike-perch were quite stable, averaged about 600 t. Russian catches for the same period followed the same tendency (Figure 18).

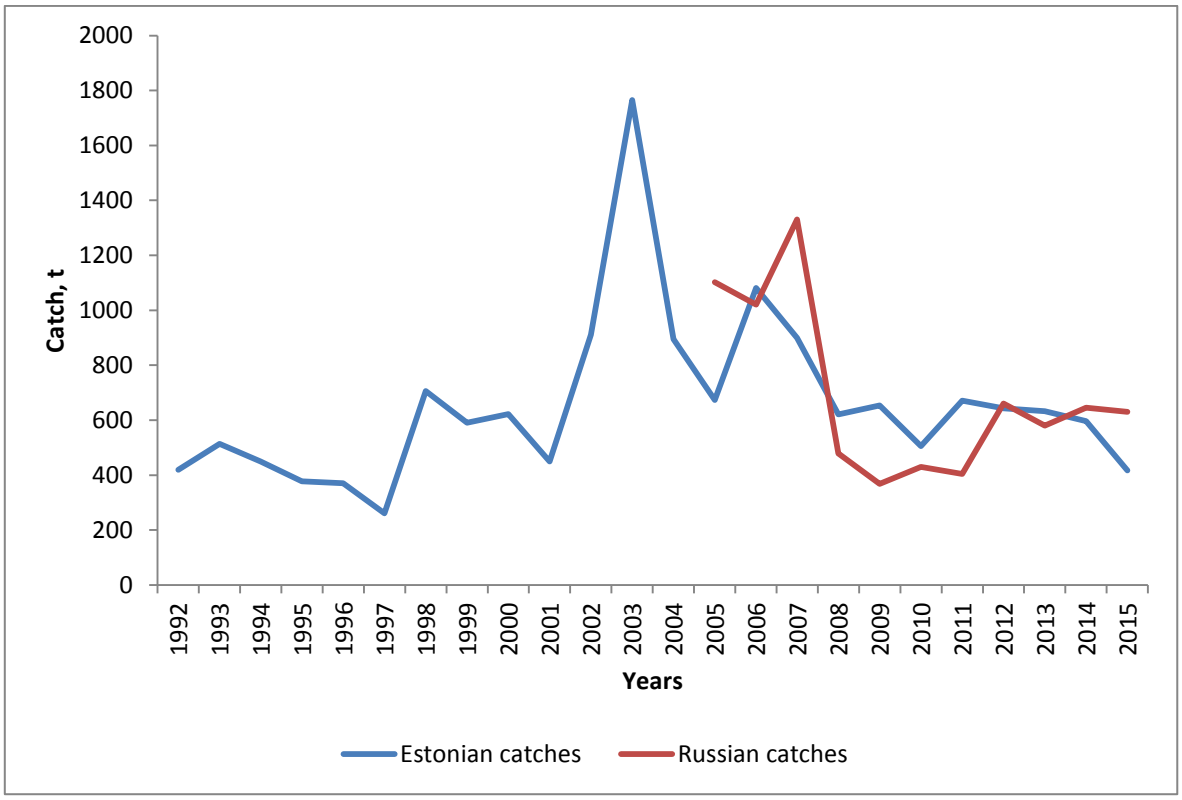

Figure 18: Estonian (1992-2015) and Russian (2005-2015) catches (t) of pike-perch in Lake Peipus. (Sources: http://pub.stat.ee/px-web.2001/Dialog/Saveshow.asp http://www.agri.ee http://priroda.pskov.ru/vidy-deyatelnosti/vidy-deyatelnosti/rybnyy-promysel-vodnye-bioresursy).

The intensity of pike-perch fishing in Lake Peipus is very high at the present time and, due to this, pike-perch generally reach the age of only 6-7 years, with older generations constituting less than one percent of the total catch (Table 12).

On average, for the period 2009-2015, 64% of the Estonian pike-perch harvest from Lake Peipus was removed with large-mesh nets (Eschbaum et al. 2014; http://www.agri.ee). Among other fishing gears, only Danish seines gave roughly the equal number of landed pike-perch in some years (for example, 2012). Details of pike-perch fishing with Danish seines are described in Section 0 of this assessment report.

According to the most recent ERFC report (November, 2016), the pike-perch stock in Lake Peipus has remained in satisfactory condition in recent years, and slightly increased during the last year. The pike-perch population in 2016 was dominated by fish of abundant generations of 2012 and 2015. Fish of these productive cohorts will form the basis of the pike-perch stock and pike-perch catches in 2017. Scientists also reported that another productive generation of pike-perch appeared in Lake Peipus in 2016 (ERFM 2016).

Table 12: CPUE of pike-perch of various ages (number of individuals per trawling hour) based on trawl fishery on Lake Peipus from 1997-2006 and 2008–2016 (the numbers in bold and italics indicate strong year classes of 2005, 2012 and 2009, 2015 respectively).
(Source: Vaino et al. 2006, cited in Kangur et al. 2012; Eschbaum et al., 2013; EMI, 2017).

Year	Age group						Total
	0-1	**1-2**	**2-3**	**3-4**	**4-5**	**>5**	
1997	793	64	423	8	0	2	1,290
1998	33	766	42	161	3	1	1,006
1999	637	23	270	9	13	0	952
2000	264	769	8	77	3	3	1,124
2001	852	40	102	3	11	2	1,010
2002	125	654	16	16	0	0	811
2003	0	88	258	5	0	0	351
2004	130	1	60	39	1	0	231
2005	**1,424**	28	0	11	2	0	1,465
2006	0	**902**	16	0	4	1	923
2007	-	-	-	-	-	-	-
2008		9	0	**102**	1	0	664
2009		33	4	0	**35**	2	182
2010		*347*	32	3	0	**10**	392
2011		0	*180*	8	1	1	189
2012		41	3	*59*	1	0	104
2013		**174**	17	0	*18*	0	209
2014		34	**156**	11	0	*14*	216
2015		5	13	**86**	6	4	114
2016		*179*	5	9	**37**	1	232

Table 13: Pike-perch weight (kg per trawling hour) based on trawl fishery on Lake Peipus from 2008–2016 (the numbers in bold and italic indicate strong year classes of 2005, 2012 and 2009, 2015 respectively).
(Source: Eschbaum et al., 2013; EMI, 2017).

Survey year	Abundance/age group					
	1+	**2+**	**3+**	**4+**	**>4+**	Total
2008	1	0	**49**	3	0	54
2009	3	1	0	**37**	5	47
2010	*30*	20	4	0	**22**	75
2011	0	*43*	12	2	3	60
2012	4	1	*35*	1	1	42
2013	**13**	7	0	*26*	2	48
2014	4	**40**	8	0	*19*	71
2015	1	6	**66**	10	9	91
2016	*36*	4	8	**59**	3	110

3.5.5 Perch and pike-perch stock assessments

The status of stocks of commercial fish species and catch forecasts in Lake Peipus are determined using a direct method of accounting. Stock assessments are based on the results of an autumn survey with a "vendace" research trawl, which is a GosNIORH-developed 18 m trawl with a codend mesh of 12-14 mm; both Estonia and Russia use the same trawl design for surveys undertaken in their respective portions of Lake Peipus.

Timing of the autumn survey (August-September) takes into account the long-term characteristics of spatial distribution of the different commercial species within Lake Peipus. The duration of the full-scale trawl survey (at constant fishing) is around 3 days in Lake Pskov and 5 days in Lake Peipsi and Lake Lämmijärv. The catch per trawling operation (individuals), converted to one hour's duration, serves as the main indicator. The results of the research trawl catches of pike-perch are shown in Table 12 and Table 13.

The stock size is assessed by the standard formula (Sechin 1990):

$$N = \frac{S \cdot y \cdot 10^6}{l_d \cdot v_t \cdot t \cdot k}, \text{ individuals}$$

where S = the area of the habitable part of the lake (km²);
y = catch of certain species of fish by trawl per survey (individuals);
l_d = the distance between the trawl board during work (m);
v_t = average speed of trawling (m / h);
t = duration of trawling (hours);
k = coefficient of absolute catchability of trawl.

The results for different ages are summed for the entire habitable area of Lake Peipus (including territorial waters of Estonia and Russia). The stock of fish at the end of the growing season in the lakes is then estimated with consideration of the autumn harvest according to official statistics.

Conventional methods for calculating natural mortality rates are used for determining fish stock reserves (Tjurin, 1967; Ricker, 1979; Rudenko, 1985; Shibayev, 2007). The coefficients of catchability of the research trawl for different species are taken from the literature (Sechin 1990).

The method of calculating the actual stock status of Lake Peipus is explained using the example of pike-perch (Table 14). Estonia has fishing quotas only in Lakes Peipsi and Lämmijärv (total area = 2,847 km^2), and according to the agreement between the scientists from the both sides, 95% of this area is habitable for the fish (S = 2,705 km^2). In the autumn of 2016, 513 age 4+ and older pike-perch were captured during the trawling surveys (Estonian and Russian side together). The parameters of the gear and trawl survey used for calculation were as follows:

S = 2,705 km^2;
y = 513
l_d = 25 m;
v_t = 6,000 m/hr;
t = 24.44;
k = 0.15 (The coefficient of absolute catchability of trawl differs for different age-groups. For pike-perch, the values used are: 0+ (0.4), 1+ (0.3), 2+ (0.25), 3+ (0.25), 4+ and older (0.15)).

Thus, according to equation N = 2,705 x 513 x 10^6 / 25 x 6,000 x 0.15 x 24.44, it is estimated that 2,524,000 pike-perch of age 4+ and older are in the population. If the average weight of age 4+ and older pike-perch in the catch was 1.6 kg, the total age 4+ and older biomass of pike-perch in Lakes Peipsi and Lämmijärv was 2,524,000 x 1.6 = 4,038 t.

Table 14: The size of the stock and TACs for pike-perch in Lakes Peipsi and Lämmijärv.

Generation	Stock size 2016				TAC 2017		
	Age	N, thous.	W, kg.	B_W (t)	Age	N, thous.	B_W (t)
2015	1+	7,923	0.2	1,585	2, 2+	754	422
2014	2+	213	0.6	128	3, 3+	39	42
2013	3+	360	0.9	324	4, 4+	65	82
2012*	4+ and older	2,524	1.6	4,038	5, 5+ and older	457	979
Total		11,019		6,074		1,315	1,525

Following the stock assessment, fishery managers of both countries set the Total Available Catch (TAC) for all commercial species in Lake Peipus. TACs are based on a principle of optimal removals suggested by Tjurin (1967), under which the appropriate level of fishing mortality should not exceed natural mortality. Usually, the coefficient of natural mortality for fish targeted by commercial fishing is approximately 30%, so the TAC is consequently set at approximately the same value. This principle of stock management has been used for a number of years in freshwater fisheries in the former Soviet Union, and has shown to be very effective in maintaining populations, including those populations of perch at the Irikla and Bratsk reservoirs which were MSC certified in 2016.

For pike-perch in Lake Peipus, the TAC is set at 0.1813 B_N (18.13% of total commercial stock abundance), according to expert advice of the State ecological expertise for TAC forecast materials of fish on Lake Peipsi. As a rule, the age groups 1+ to 3+ constitute the maximum abundance and biomass in the population, with an average natural mortality of 0.25. The lower level of fishing mortality used to set the TAC is explained by the use of a precautionary approach, since managers take into account a number of uncertainties, including potential unknown levels of fishing mortality associated with discarding from the commercial fishery, as well as from recreational fishing and poaching.

The actual coefficient of fishing mortality (exploitation coefficient u) in the forecast year is related exponentially to the catch factor, in accordance with the formula:

$$\phi F(u) = 1-e^{-0,2}(F) = 18.13\%$$

As such, the TAC by abundance = 2,524,000 x 18.13% = 457,000 individuals of age 5 and older in 2017.

Estonian quotas are subdivided into two half-years. It is assumed that the fishing conditions in the first half of the year are not as good in comparison to the conditions in the second half of the year (due to weather conditions), and so the quota is divided 40% to the first six months, and 60% to the second six months. Also, due to growth of fish, in the first half of year the average weight of pike-perch is assumed to be 1.6 kg, but in the second it is 2.5 kg. The calculations of the quota by weight therefore give different results for the first six months of the year (457,000 x 1.6 x 0.4 = 292.5 t) in comparison to the second six months (457,000 x 2.5 x 0.6 = 685.5 t). Thus, the total quota for pike-perch of age 5 and older in 2017 is 979 t. Similarly, the stocks and TACs are calculated for all other ages. As a result, the total calculated TAC value for pike-perch was 1,525 t (see Table 14).

The calculations for the stock status and the TAC values for perch are carried out in a similar manner to pike-perch, and are presented In Table 15. The following parameters were used to calculate the size of the perch stock by age 2+ and older by scientific trawl catch:

$S = 2,705\ km^2$;
$y = 4,780$

l_d = 25 m;
v_t = 6,000 m/hr;
t = 24.44;
k = 0.4.

Thus, according to equation, N = 2,705 x 4,780 x 10^6 / 25 x 6 000 x 0.4 x 24.44 = 8,818,000 perch of age 2+ and older. Assuming that the average weight of perch in the catch was 170 g, the total biomass of perch in Lakes Peipsi and Lämmijarv was equivalent to B_W = N x WB = 8,818,000 x 0.17 = 1,499 t of perch of older generations.

Table 15: The size of the stock and TACs for perch in Lakes Peipsi and Lämmijärv

Generation	Stock size 2016			TAC 2017		
	Age	N, thous.	B_W (t)	Age	N, thous.	B_W (t)
2015	1+	435,282	5,441	2, 2+	78,903	1,973
2012*	2+ and older	8,818	1,499	3, 3+ and older	1,599	336
Total		444,101	6,940		80,502	2,308

As in the case of pike-perch, a precautionary level for the size of the commercial TAC was established as 0.1813 B_N. Taking into account an exponential relationship of the actual coefficient of fishing mortality to catch factor, the TAC by abundance for age 3+ and older perch = 8,818,000 x 18.13% = 1,599,000 individuals.

It is assumed that the fishing conditions in the first and the second halves of the year is equal for perch fishing, but the average weight of perch is taken is 170 g for the first half of the year, and 250 g for the second half. The calculations of quotas by weight therefore give different results for the first six months of the year (1,599,000 x 170 x 0.5 = 136 t) in comparison to the second six months (1,599,000 x 250 x 0.5 = 200 t). Thus, the total quota for perch of age 3+ and older in 2017 was 336 t. The stocks and TACs are calculated in the same manner for younger ages classes. As a result, the total calculated TAC value of perch in 2017 was 2,308 t.

This estimated value was analyzed by specialists and managers of the two countries at the EFCF in November 2016. In accordance with intergovernmental agreements, Estonia receives half of the total quota for perch in 2017, i.e. 1,150 t.

3.5.6 Stock status and reference points

The environmental conditions within Lake Peipus vary over time, and so the ecosystem and fish populations within the lake do not reach equilibrium status. Instead, the maximum sustainable yield and equivalent target reference point (TRP) for each stock are subject to change. Determination of the status of commercial stocks within Lake Peipus is therefore undertaken annually, but does not explicitly use biological reference points such as B_{LIM} or B_{MSY}.

Stock assessments estimate the total commercially available biomass (*Ba*) on an annual basis. TACs are determined based on a principle of optimal removals suggested by Tjurin (1967), according to which the appropriate level of commercial fish mortality should not exceed the natural mortality coefficient (M). This principle of stock management has been used for a number of years in freshwater fisheries in the former Soviet Union, and has shown to be very effective in maintaining populations.

For perch and pike-perch of Lake Peipus, the estimates of *Ba* is used to calculate 20-25% *Ba*. The TRP (which is also equivalent to the limit reference point (LRP)) based on 20-25% *Ba* is used to establish annual fishing opportunities for perch and pike-perch (i.e., fishing mortality, considered as $F_{0.2\text{-}0.25} \leq M$, is used with the same intent as F_{MSY}) and this precautionary approach has been demonstrated to effectively keep the stock well above the point at which recruitment would be impaired. This approach is considered appropriate for the scale and intensity of the fishery.

3.5.7 History of fishing and management

Lake Peipus was the first water body in Russia where fishery limitations were introduced, in 1859, with the document entitled ''Rules on restrictions of fishing in Lake Peipsi''. These regulations banned fishing for juveniles and usage of fine mesh nets.

A brief history of fisheries in Lake Peipsi in the 20th century is described according to Pihu (1996). In the 1930s, Estonia was an independent state and collaboration with Russia in the field of fisheries was lacking. In this period the total catch of fish in Lake Peipus was relatively large. The overwhelming majority of the catch (77-90%) was taken by Russia, which tried to get as much fish as possible from the lake. For this purpose, large twin trawls (i.e., a trawl towed between two motorboats) were used; in 1939, 18 such gears were in use. The bulk of the catch consisted of comparatively cheap lake smelt and small fish (mainly small perch, ruffe, roach etc.). Owing to this intensive trawling practice, the stocks of valuable fishes (initially, bream) began to diminish at the end of the decade.

During the 1930s Estonian fishermen took only 10-23% of the total catch of fish in the lake, the main commercially targeted species were pike, bream and pike-perch; lake smelt and other small fish were considered to be of second-rate importance. Fish were caught mostly with weirs, haul seines and gill nets, while trawls were not used.

From 1944-1991, Estonia was part of the Soviet Union, and subordinate to Soviet legislation, principles and customs. Fishing was essentially intensified in the whole country, including Lake Peipus. In that time, about 40-45% of the total fish catch in Lake Peipus was taken by Estonian fishers. After World War II, trawling was restored and intensified drastically. 30 large twin-trawls were used in the lake in the middle of the 1950s. For some time, the catch of bream and other large, valuable fish increased rapidly, but soon their stocks were overexploited and the catches fell. Intensive trawling destroyed the stock of pike-perch which is particularly sensitive to this type of fishing gear. Pike-perch (both young and adult), unlike the majority of other big fishes, prefer parts of the lake, which are also much more suitable for trawling than the inshore zone.

At the end of the 1950s the use of twin-trawls was prohibited in Lake Peipus, but they were replaced by a new fine-meshed active fishing gear, Danish seines, which appeared to be quite destructive for the juveniles of valuable fish species, primarily for pike-perch. As a result, the stock of pike-perch fell to a very low level for the following three decades.

According to the thinking of ichthyologists in the 1950s, perch, roach and ruffe were regarded as dangerous food competitors and roe eaters of more valuable fishes; as such, these species were targeted for destruction across the Soviet Union, including in Lake Peipus (Tjurin 1967). Burbot was also considered a harmful predatory fish in the lake (Efimova 1963). Serious attempts were made to destroy the stocks of these fish by means of intensive trawling and, later, with Danish seines, although without notable results.

In the 1960s and 1970s, ichthyologists established that neither perch nor roach endanger valuable fish, particularly bream. Ruffe is, in fact, an undesirable food competitor and roe eater, but there is no hope to reduce its abundance by fishing (Pihu & Pihu 1975, cited by Pihu 1996). Burbot is also rather more useful than harmful because as a predatory species its main food consists of ruffe and small perch (Pihu & Pihu 1968, cited by Pihu 1996). A legal size of 40 cm (standard length) has been fixed for burbot in the lake. Use of Danish seines, which were proven to be destructive for valuable

fish, has been considerably restricted since 1974, and the mesh-size of the cod-end of the seines was increased from 8-12 mm to 20-40 mm. As a result of limiting Danish seines, the abundance of pike-perch in the lake has increased notably.

As a result of changes to fisheries management and to the nutrient, pollution level and temperature regime of the lake, the fish assemblage of Lake Peipus has changed considerably over the last century (Figure 19). Historically the assemblage was dominated by vendace and smelt, but during last decades a shift towards dominance of perch and pike-perch took place. The following factors contributed to these changes. 1) the complete ban of bottom trawls in late 1950s and several restrictions referring number and mesh size of Danish seines, 2) climate change resulting in warmer summers and milder winters in recent years suppressed cold-water vendace, smelt and burbot, and favoured more warm-water perch and pike-perch. Warming also facilitated eutrophication which affected the fish assemblage in a similar way.

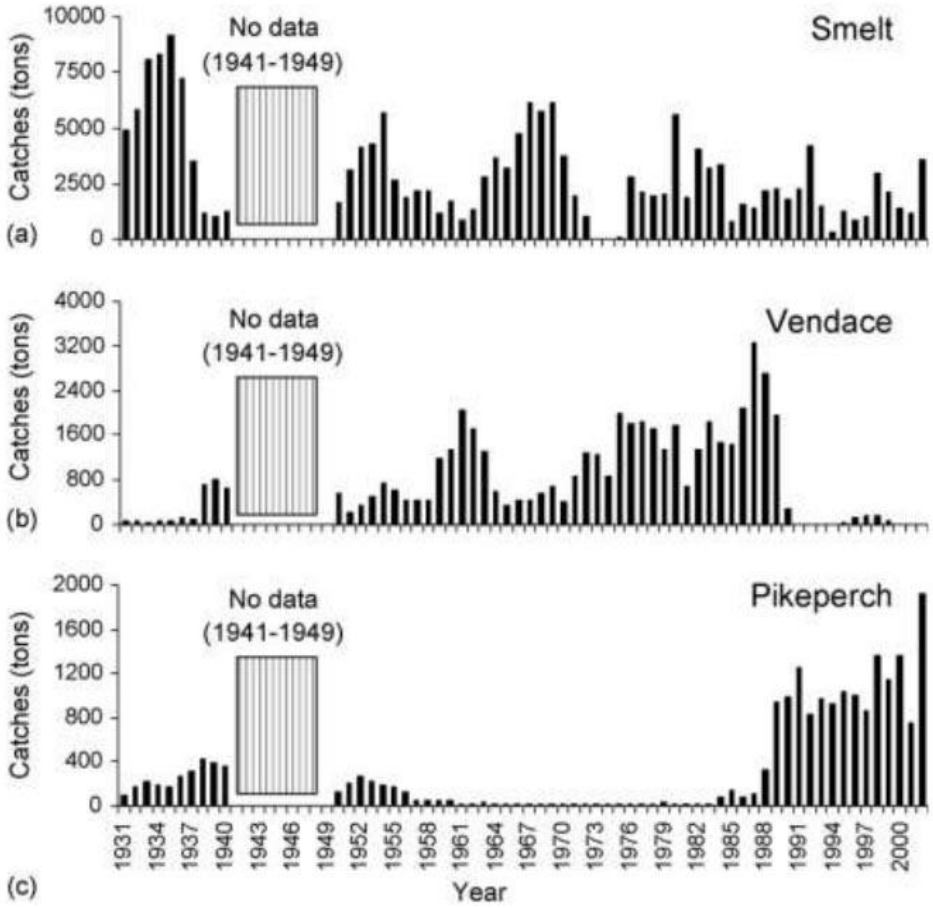

Figure 19: Catches of smelt (a), vendace (b) and pike-perch (c) in Lake Peipsi during 1931-2002 (Source: Kangur et al. 2007)

According to the most recent conclusions of ERFC (ERFC 2015, ERFC 2016), the status of the pike-perch, perch, pike, bream and roach is good, whereas vendace, burbot and smelt are at a low level. Estonian quota (which is a half of total quota in two norther lakes) and Russian quota for entire Lake Peipus for 2016 are provided in Table 16.

As has been the case in recent years, quotas were exhausted in early autumn already, because the fishing capacity was high and fishing efforts exceeded it sometimes (in the case of large-mesh nets). In 2013, first the quota of bream and then that of pike-perch was used up by more than 90%, which

is why fishing had to be stopped altogether from October 10th. A similar situation occurred in 2014 with perch and bream and, in 2015 with perch, bream and pike. On the whole, the quotas of 2013-2015 were used up to the extent of 79-86%. The quotas of the four key species (pike-perch, perch, bream and pike) were used up to the extent of 65–100% (see Table 5).

Perch and pike-perch generated the bulk of the catch value, with the proportion of pike-perch being 46% and that of perch being 39% in 2013. Among fishing gear, large-mesh gill nets produced the biggest revenue (39% of the total catch value), followed by trap nets and line of trap nets (36% of the catch value), and thirdly by Danish seine (24% of the catch value) (Eschbaum et al. 2014).

Table 16: Total available catch (TAC, t) in Lake Peipus for 2016**.**
(Source: ERFC 2015)

Fish species	TAC for 2016	National quotas (t)	
		Russia	Estonia
Perch	**2100**	**1100**	**1000**
Lake Pihkva	100	100	-
Lakes Peipsi and Lämmijärv	2000	1000	1000
Bream	**1650**	**925**	**725**
Lake Pihkva	200	200	-
Lakes Peipsi and Lämmijärv	1450	725	725
Pike-perch	**1550**	**825**	**725**
Lake Pihkva	100	100	-
Lakes Peipsi and Lämmijärv	1450	725	725
Roach	**800**	**500**	**300**
Lake Pihkva	200	200	-
Lakes Peipsi and Lämmijärv	600	300	300
Ruffe	**400**	**250**	**150**
Lake Pihkva	100	100	-
Lakes Peipsi and Lämmijärv	300	150	150
Pike	**290**	**175**	**115**
Lake Pihkva	60	60	-
Lakes Peipsi and Lämmijärv	230	115	115
Burbot*	**110**	**60**	**50**
Lake Pihkva	10	10	-
Lakes Peipsi and Lämmijärv	100	50	50
Vendace	**30**	**15**	**15**
Lakes Peipsi and Lämmijärv	30	15	15
Smelt*	**15**	**10**	**5**
Lake Pihkva	5	5	-
Lakes Peipsi and Lämmijärv	10	5	5
Peipsi whitefish*	**2**	**1**	**1**
Lakes Peipsi and Lämmijärv	2	1	1
Others**	**75**	**50**	**25**
Lake Pihkva	25	25	-
Lakes Peipsi and Lämmijärv	50	25	25
Total	**7022**	**3911**	**3111**

*- specialized fishery is not conducted due to small number of fish, these species are presented as by-catch in all fishing gear.

**– other fishes (asp, white bream, vimba bream, tench, eel) are presented as by-catches due to low number of these species.

One specific feature of Lake Peipus fisheries management is the double regulation of fishing capacity (and thereby catches). While in the great lakes of Europe as well as in Lake Võrtsjärv and coastal waters of Estonia the quantities of fish caught are regulated only through the input (the maximum number of fishing gear, the fishing period, the mesh size of nets, etc.). In Lake Peipus the quantity of fish caught is also restricted through the output, i.e. the uptake of fishing quotas. This mechanism ensures that fish stocks and catches remain as stable as possible within the limits set by natural conditions, and allows the fish stocks of the lake that belongs to two countries to be used on an equal footing. Quotas are determined on the basis of the size and composition of fish stocks. In the case of pike-perch, for example, the recommended fishing mortality (F) has never exceeded 0.3. This figure represents a sustainable harvest level for pike-perch.

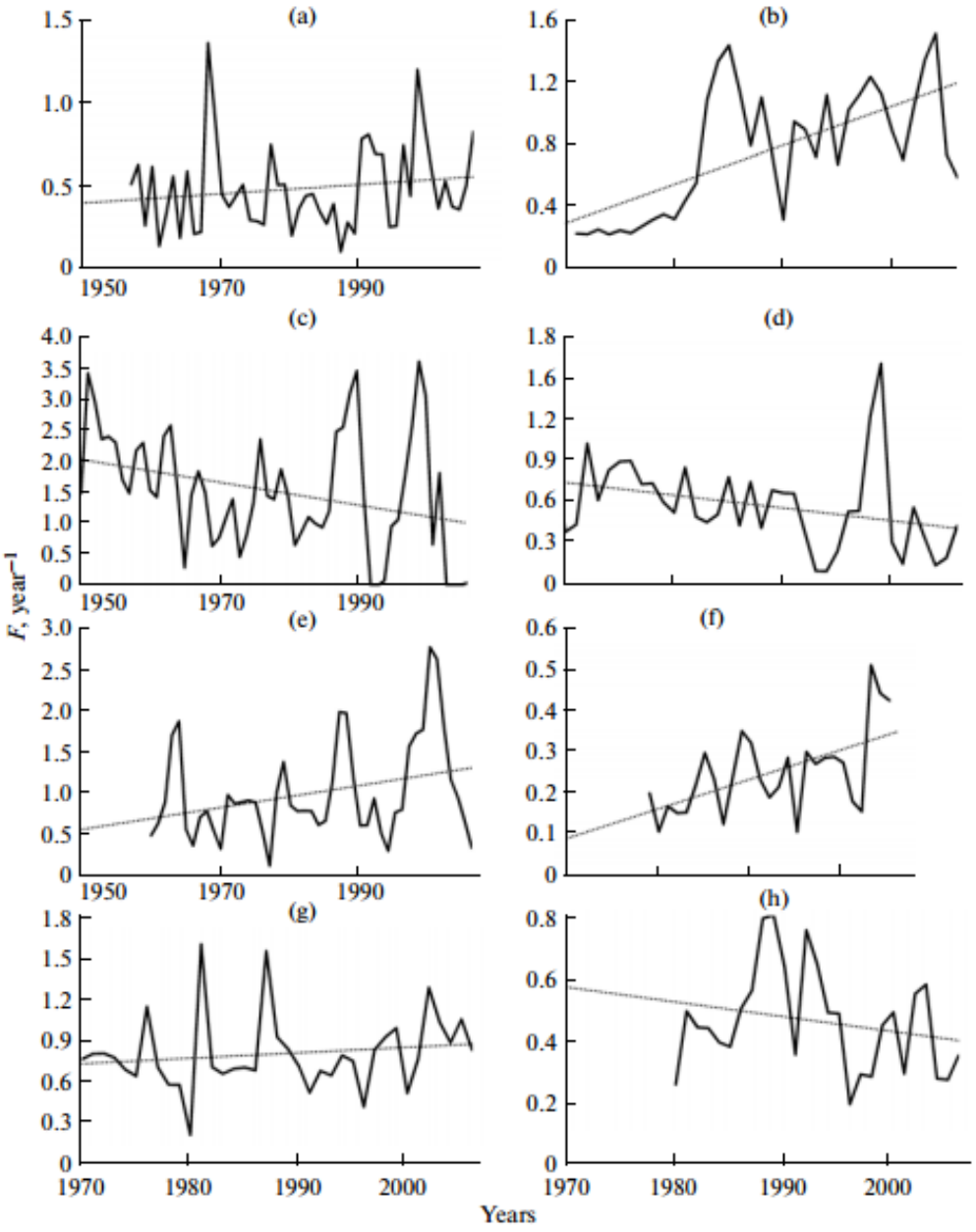

Figure 20: Dynamics of fishing mortality reconstructed using the ADAPT-VPA calculation procedure: (a) bream, (b) roach, (c) vendace, (d) whitefish, (e) pike-perch, (f) perch, (g) pike, (h) ruffe; (—) calculation data; (---) linear trends.
(Source: Bobyrev et al., 2013).

The results of modelling analysis of fisheries impacts on the state of populations of eight main commercial fish species (bream, roach, vendace, whitefish, pike-perch, perch, pike, ruffe) indicate that the fishery is not the leading factor controlling the processes of population changes in Lake Peipus (Bobyrev et al. 2013). For each of the considered species, the dynamics of fishing mortality demonstrates a certain trend (Figure 20); however, in most cases, the changes in the fishery intensity are not so great as to explain the observed tendencies in the dynamics of the total stock biomass. Only with respect to two species (perch and roach) can one state that the decrease in the stock biomass is in part caused by an increase in the press of fishery.

In any case, because the fishery in the water body is in essence multispecies, under conditions of domination of the fishing factor, one could expect sufficiently high conjugation in the dynamics of fishing mortality of individual species. The results of pair-wise comparisons of time series of fishing mortality (after preliminary removal of trends) indicates that the correlation between the values of mortality turns out to be statistically significant in only 3 of 28 cases. The strength of correlation in this case remains low: maximum coefficient of correlation (in the vendace - whitefish pair) reaches the value r=0.56 (other statistically significant correlations are in pairs the vendace – pike-perch, r=0.50 and the pike – ruffe, r=0.43). Thus, the authors of the research concluded that the observed dynamics of resources of the main commercial fish of Lake Peipus is related mainly to ecosystem changes taking place in the water body (Bobyrev et al. 2013).

Another specific feature of Lake Peipus fisheries management has been the reduction of the standard minimum size of pike-perch in accordance with the general condition of the stock and the strength of future cohorts to be fished. This approach has served the purpose of reducing discards and thus hidden fishing mortality in autumn fishing. Changes to the standard minimum size of pike-perch have primarily been applied in the widespread use of Danish seines, but concessions have also been made in trap net fishing, and the least in gill net fishing. Catches of pike-perch smaller than the standard minimum size have always been deducted from the quota.

Fishing with Danish seines is currently considerably more restricted than in the past. There have been times when fishing with Danish seines was allowed from August to May. Now, however, this fishing gear may be used only in autumn and on a limited number of days. Unlike other fishing methods, seine fishing is subject to strong supervision, which comprises the requirement to use a vessel monitoring system (VMS), and the requirement to give advance notification of catches and landing site.

Neither Estonia nor Russia has made full use of the agreed fishing period in recent years (Figure 21). Fishing with Danish seines has essentially been limited to around a month on both sides, given that, on average, 31 trips to the lake are undertaken per seine in Estonia and 37 in Russia during 2009-2013 (Eschbaum et al. 2014). Perch has always been the main target species in this fishing gear, with the proportion of pike-perch being limited to 8–27%, and on average to 20% (Figure 22).

To minimise the potential for small pike-perch occurring in catches to be discarded (with potential unseen mortality issues), the standard minimum size of pike-perch is reduced for the period of seine fishing, though by different amounts each year depending on stock characteristics (see Figure 21).

In addition to Danish seines, small pike-perch may be fished in autumn using trap nets (based on the equal right to catch). Analyses of the official catch data allow for the conclusion that, on average, catches of pike-perch smaller than the traditional minimum size do not represent more than 20% of the total annual pike-perch catch (i.e., 125 t), at least on the Estonian side.

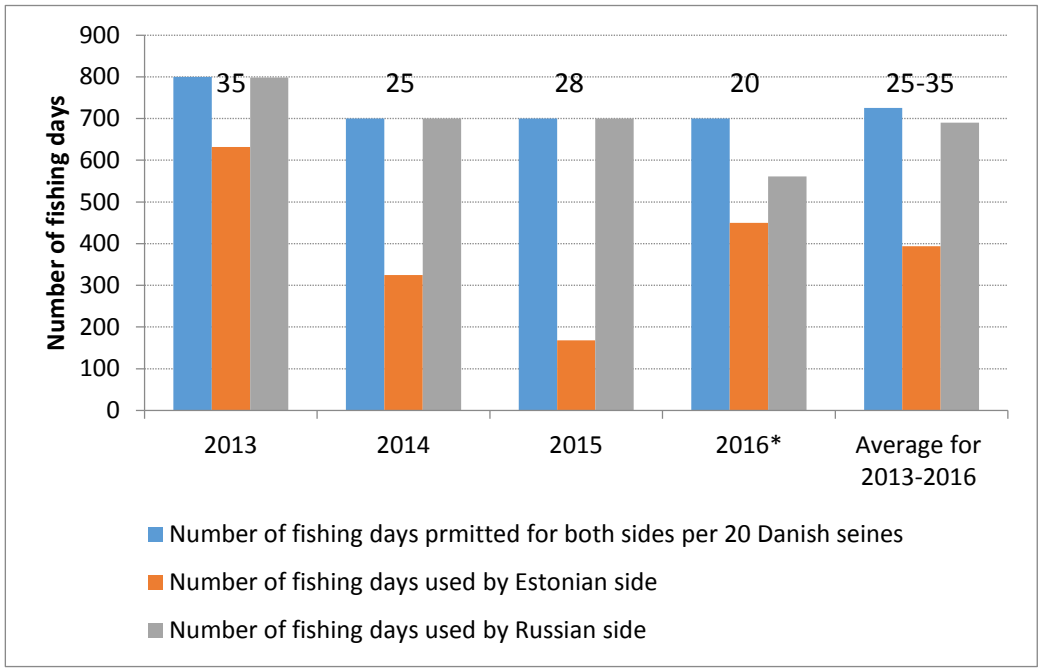

Figure 21: Permitted and used Danish seine fishing days on Lake Peipus from Estonian and Russian sides, 2013-2016 (the numbers above columns indicate the standard minimum size of pike-perch (SL, cm) set for the fishing period).
* data for the first ten months of 2016 were available to the Assessment Team.

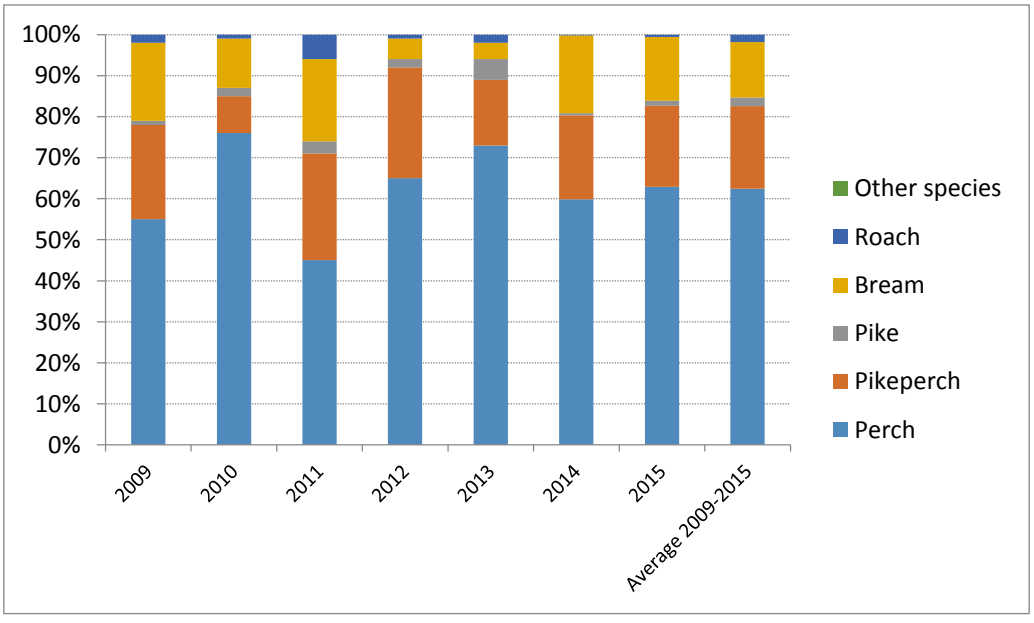

Figure 22: Species composition (%) of Estonian Danish seine catches from Lake Peipus, 2009-2015.

As in other pike-perch fisheries, a large part of the pike-perch catch from Lake Peipus is now taken using passive fishing gear, specifically large-mesh gillnets, which are particularly prevalent in under-ice fishing during the first half of the year (Table 17and Table 18). The minimum allowed mesh size of large-mesh gill nets is usually 65/130 mm, and in some years temporarily also 55/110 mm.

Table 17: Pike-perch catches from Lake Peipus, distribution of catches between different fishing gear (t), and average catches (t and %), 2009-2015.
(Source: Eschbaum et al., 2014; http://www.agri.ee).

Fishing gear/ fishing period	2009	2010	2011	2012	2013	2014	2015	Average	%
Gillnets, LM[1]	358	402	478	246	446	424	274	375	64
Gillnets, SM[2]	1	1	0	0	0	1	0	0	0
Traps	34	22	28	24	18	82	73	40	7
Lines of traps	111	59	84	78	76	22	18	64	11
Danish seines	146	19	77	287	87	63	44	103	17
Other fishing gear	4	3	1	8	4	4	7	5	1
Total	**653**	**506**	**669**	**643**	**632**	**596**	**416**	**587**	**100**

LM[1] SM[2] – large-mesh nets with a minimum mesh size of 55/110 or 65/130 mm, depending on the year of the fishing season
SM[2] – small-mesh nets with a minimum mesh size of 30/60 or 40/80 mm

Table 18: Proportion (%) of net catches in landings of pike-perch in different years and half-years.
(Source: Eschbaum et al., 2014; http://www.agri.ee)

Fishing period	First half year	Second half year	Total
2009	55	55	55
2010	88	69	80
2011	91	47	72
2012	87	25	38
2013	77	69	71
2014	95	68	71
2015	78	64	66
Average	**82**	**57**	**65**

Catches of such fishing gear are dominated by more than 40/46 cm long fish aged four years and more (Figure 23, Table 19, Table 20). Catches of large pike-perch (longer than 40/46 cm) in gill nets

have been the main reason for restricting fishing on the lake in some years. For example, large pike-perch catches in January 2011 entailed restrictions on fishing using gill nets in the first half of the year. In September 2013, large pike-perch catches led to total closure of fishery from early October (Figure 24).

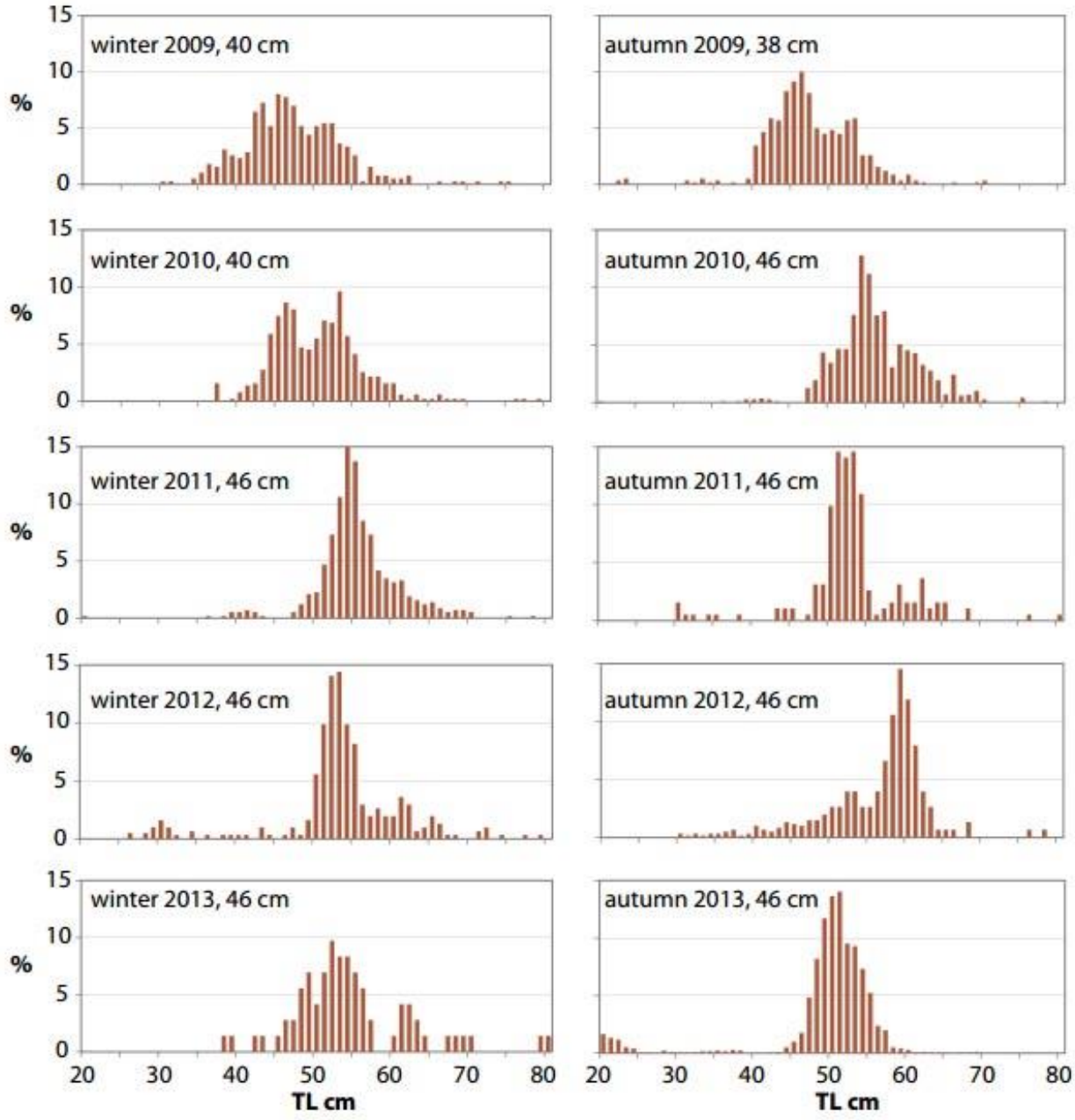

Figure 23: Length composition (%) of pike-perch catches taken with gill nets and applicable standard minimum sizes, 2009-2013.
(Source: Eschbaum et al. 2014)

Table 19: Age composition (%) of pike-perch catches taken with gill nets in winter 2009-2013.
(Source: Eschbaum et al. 2014)

Age	2009	2010	2011	2012	2013

<4	0	0	3	9	0
4	87	0	6	57	14
5	11	95	0	21	64
>5	2	5	91	13	22
Total	**100**	**100**	**100**	**100**	**100**

Table 20: Age composition (%) of pike-perch catches taken with gill nets in autumn 2009-2013. (Source: Eschbaum et al., 2014)

Age	2009	2010	2011	2012	2013
<4+	3	9	81	31	9
4+	93	0	14	66	80
5+	4	85	4	3	10
>5+	1	6	1	1	1
Total	**100**	**100**	**100**	**100**	**100**

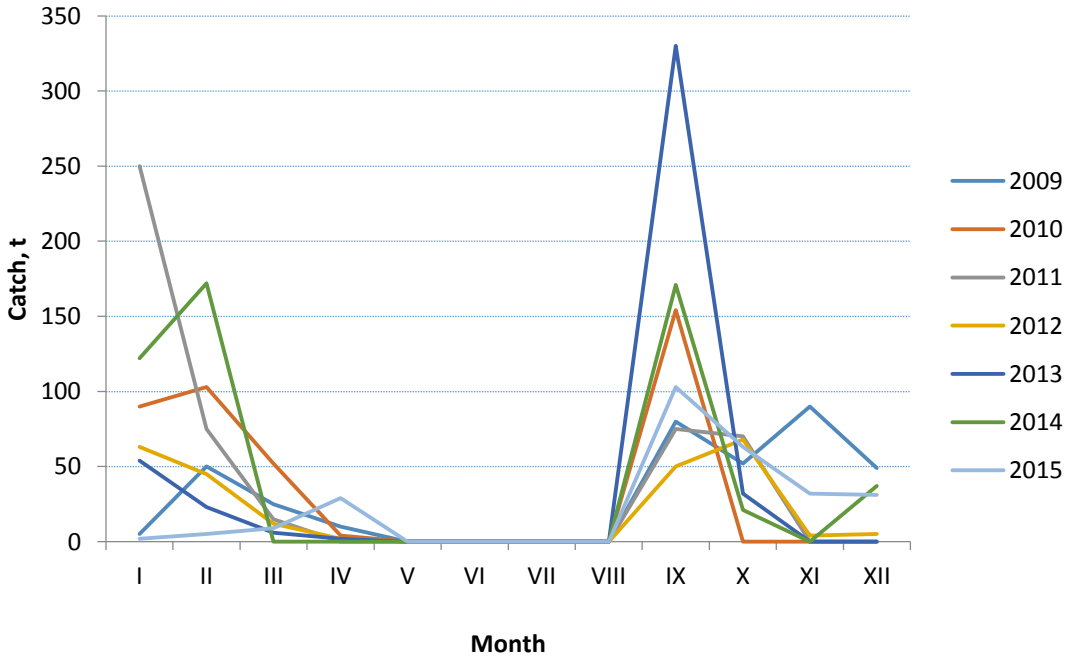

Figure 24: Dynamics of Estonian gillnet catches of pike-perch, 2009-2015. (Source: Eschbaum et al. 2014, http://www.agri.ee)

3.5.8 Ecosystem effects and trophic interactions

Poor feeding conditions for perch and pike-perch within Lake Peipus lead to slow growth and high natural mortality during the first years of life, and ultimately to less abundant cohorts available for commercial fishing compared to years when the abundance of lake (dwarf) smelt, an important prey item, is high.

The results of model experiments confirm the need for strict regulation of the abundance of pike-perch in the multi-species fishery in Lake Peipus. Analysis of the role of ecological factors, in

particular, of trophic relations, in the dynamics of fish populations, was performed using Ecopath with Ecosim modelling. The results of mass balance calculations show that the conditions of the 1980s (with respect to which model parameterization was performed) fully conforms to the demands of the community balance: the values of the coefficients of ecotrophic efficiency for all trophic groups do not exceed one unit. This means that the biological production formed in the community is sufficient for satisfying energy demands of all its members and maintaining their biomass at a stable level.

The results of model experiments indicate that the increase in the biomass of pike-perch (typical predator) to the modern value, 1.46 t/km^2, results in unbalancing the system: the coefficients of the ecotrophic efficiency of all groups comprising the spectrum of its feeding (ruffe, smelt, vendace or European cisco, perch, roach) (Pihu & Pihu 1979) take values that considerably (by 20–30%) exceed one unit (Figure 25). This circumstance would indicate that predators would consume not only production formed by these species but also the standing biomass, which would inevitably lead to a decrease in their stocks, also from the results of single species analysis of stocks of commercial fishes (Bobyrev et el., 2013).

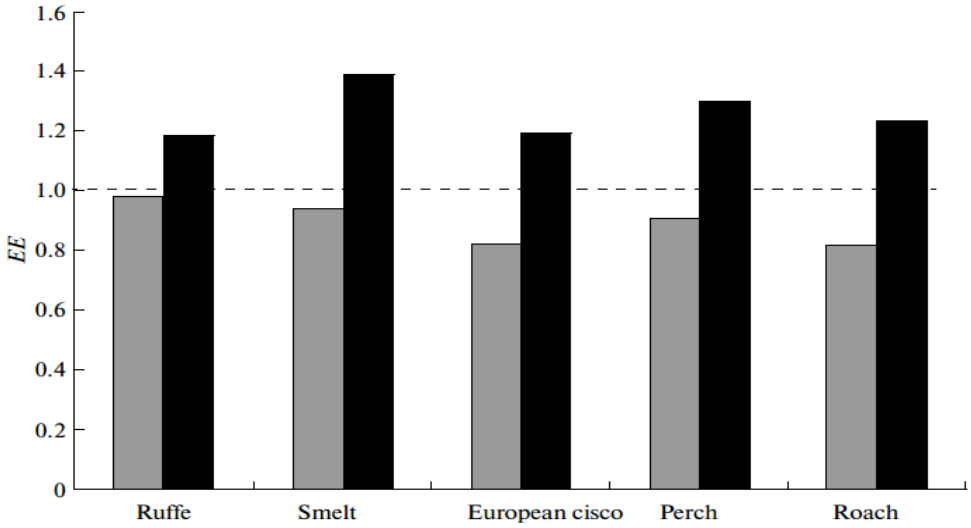

Figure 25: Changes in the coefficients of ecotrophic efficiency at an increase in the biomass of pike-perch: grey bars - early 1980s; black bars - modern period.
(Source: Bobyrev et el. 2013)

The results of study of dynamic regimes of the biotic community of Lake Peipus are presented in Figure 26. In the series of simulation experiments, the role of the fisheries factor in the dynamics of fish populations was considered (Bobyrev et al. 2013). The data obtained indicate that a complete cessation of fishing pike-perch juveniles is capable of providing an increase in the total biomass of its population by a factor of approximately 1.5. Obviously, this is insufficient to explain actual changes in the state of the population that increased during recent decades by a factor of 10–15 (from 300 to 3,500 t and more). In this connection, the model was realized under assumption of extended pike-perch reproduction under the effect of favourable environmental factors (in the model, it is conveyed by the decrease in the natural mortality of juveniles).

In the experiment, a constant fishing pressure on all fish species corresponding to the level of the 1980s and the stability of trophodynamic characteristics of all trophic groups are presumed. Under these conditions, production resources of the community are sufficient to support the biomass of

pike-perch that approximately seven times exceeds the initial biomass (Figure 26a). The subsequent increase of its population is restrained because of depletion of its food resources.

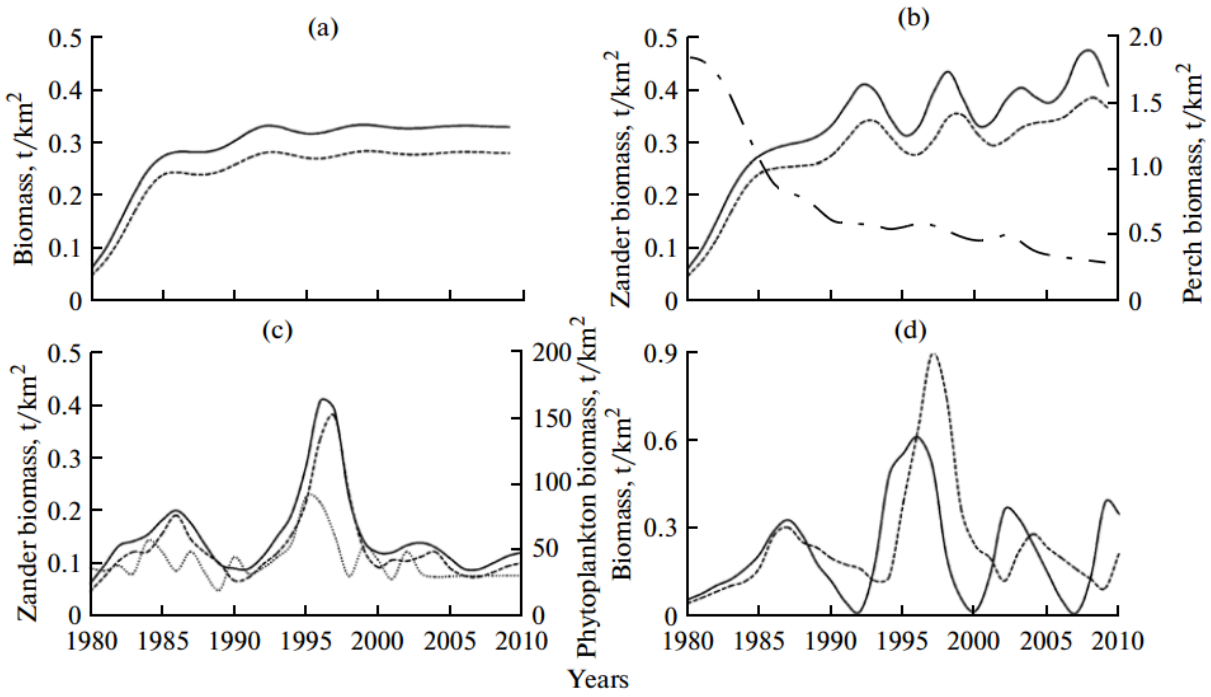

Figure 26: Dynamics of the population of pike-perch reproduced by the model with realization of different simulation scenarios: (a) extended reproduction of the population, (b) extended reproduction in combination with fishery, (c) eutrophication, (d) eutrophication in combination with the observed trends in the dynamics of the main commercial populations.
Key: (—) pike-perch juveniles; (---) adult pike-perch individuals; (–·–·–) perch; (·····) phytoplankton.
(Source: Bobyrev et el. 2013).

Figure 26b illustrates the situation when in the model, parallel to the extended reproduction of pike-perch population, actual regimes of fishery reconstructed in the course of single-species analysis using ADAPT-VPA calculation procedures are reproduced. As follows from the results of simulation, the observed changes in fishing pressure on most fish species do not exert a noticeable effect on the dynamics of pike-perch population increase. The exception is only one species – perch – whose decrease in biomass under the impact of fishing creates necessary conditions for an increase in the pike-perch stock by a factor of 10–11, as compared to the initial value (noting that such a gain is comparable to the gain actually observed).

The decrease in the perch stock can result from the explosion of winter amateur fishing, which is particularly widespread in Estonia (Orru et al. 2014). Since perch is a food competitor of pike-perch (the index of food similarity of perch with pike-perch juveniles is 0.654 and that with its adult individuals is 0.828), intensive exploitation of the perch stock sets free part of the food resource consumed by them, and that becomes accessible for pike-perch and provides the subsequent increase of its population.

The consequences of eutrophication are reproduced in the model by using the results of registration of phytoplankton abundance as input characteristics (Nõges et al. 2003). It was found that the

cascade effects emerging in the ecosystem as a result of changes in the rates of production of organisms of lower trophic levels are capable of leading to formation of strong pike-perch year-classes because of formation of favourable conditions for feeding and survival of juveniles (Figure 26c). In the last experiment (Figure 26d), parallel to the dynamics of phytoplankton, trends of biomasses of the studied fish species revealed in the course of single-species analysis were set. It is seen that this leads to the emergence of typical pulsations in the biomass of the juvenile and adult parts of the pike-perch population, as determined by the combination of effects of eutrophication and limited food resources.

Despite the qualitative pattern of the obtained results, they make it possible to clarify several issues related to the interpretation of the dynamics of individual fish species and the biotic community as a whole. In particular, the formation of several strong pike-perch year-classes and, as a result, the outburst in its numbers in the waterbody are, in all likelihood, the result of the combined effects of eutrophication providing favourable conditions for the feeding and survival of juveniles and a fishery that led to a considerable decrease in the biomass of one of its main food competitors – perch (Bobyrev et el. 2013).

3.5.9 Aquaculture and introduced species

In the 1950s and 1960s several species were introduced in the lake: Siberian sturgeon (*Acipenser baeri* Brandt), a large coregonid fish (*Stenodus leucichthys nelma* n. cubensis Titenkow) and wild carp (*Cyprinus carpio* L.), but these introductions were unsuccessful. Carps are accidentally caught in the lake, but they probably escaped from aquaculture farms in the lake. At the moment, no hatchery production takes place in the lake, but artificial rearing of the whitefish *Coregonus lavaretus* is being considered.

3.6 Principle Two: Ecosystem Background

Lake Peipus is made up of three parts – Lake Peipsi to the north, Lake Pihkva to the South, and Lake Lämmijärv) comprising the narrowest part that connects the other two. Together, the three parts of Lake Peipus form one of the largest European lakes, with a surface area of approximately 3,550 km^2.

The drainage basin of Lake Peipus has a size approximately 12 times larger than the lake surface itself, at almost 45,000 km^2. The basin is shared by Russia (59%), Estonia (33%), Latvia (8%) and Belarus (0.3%). The largest sub-catchment is the Velikaya River basin (Russia), draining approximately 58% (25,765 km^2, mean discharge 195 m^3/s) of the whole Lake Peipus drainage basin. The Emajõgi River basin (Estonia) is the second largest sub-catchment, covering approximately 20% (8745 km^2, mean discharge 68 m^3/s) of the total basin. The Emajõgi sub-catchment holds the largest lake in the basin, Lake Vörtsjärv, with a surface area of around 270 km^2. Peipus Lake and its basin discharges into the Narva River, which flows out in to the Gulf of Finland (Figure 1).

As described in Section 3.4.1 of this assessment report, all three parts of Lake Peipus are shallow, with the overall maximum depth of approximately 15 m being attained in Lake Lämmijärv. The total water volume of Lake Peipus is approximately 25 km^3 (Roll et al. 2006).

3.6.1 Primary and secondary species

Under the CRv.2.0 (MSC 2014), primary species are defined as those species that are in scope but not target (P1) species "*where management tools and measures are in place, intended to achieve stock management objectives reflected in either limit or target reference points*". Secondary species are then defined by the MSC as fish/shellfish species that do not meet the definition of 'primary' species, or species that are out of scope of the program but where the definition of endangered, threatened or protected (ETP) species is not applicable (MSC 2014).

For primary and secondary species, a 'main' designation is then given where either i) "*the catch of a species by the UoA comprises 5% or more by weight of the total catch of all species by the UoA*", ii) "t*he species is classified as 'less resilient' and the catch of the species by the UoA comprises 2% or more by weight of the total catch of all species by the UoA*", or iii) in cases where the total catch of the UoA is exceptionally large, such that even small catch proportions of a P2 species significantly impact the affected stocks/populations.

Catch data for the Lake Peipus fishery are available from the website of the Estonian Ministry of Rural Affairs[1]. Data for 2014 and 2015 were downloaded, and the catch information for gillnets and traps is presented in Table 21 and Table 22 on the following pages. The 2014 catch data for gillnets and traps show perch and pike-perch made up 27.5% and 24.5% of the total, respectively (Table 21). Common bream (*Abramis brama*), roach (*Rutilus rutilus*) and pike (*Esox lucius*) comprised 31.2%, 9.8% and 5.0% of the catch, respectively. The 2015 catch data for gillnets and traps generally show a very similar pattern to the 2014 data, with perch and pike comprising 33.5% and 18.6% of the total, respectively, and common bream (31.3%), roach (10.3%) and pike (4.5%) making up the bulk of the remainder. Small quantities of other species, including burbot (*Lota lota*) and vendace (*Coregonus albula*) in particular, made up the rest of the catch.

Perch and pike-perch are the target (Principle 1) species for this assessment of the Lake Peipus fishery, but common bream, roach and pike are considered to be main primary species. SA 3.1.3.1 (MSC 2014) also requires that pike-perch is considered as a P2 species in scoring UoA 1 (Perch), and that perch is considered as a P2 species in scoring UoA 2 (Pike-perch); in both cases, these were assessed as main primary species Burbot, vendace, ruffe and Peipsi whitefish and then considered to be minor primary species. Crucian carp is not assessed nor managed through a TAC, so is a minor secondary species (Table 21 and Table 22).

[1] www.agri.ee/et/eesmargid-tegevused/kalamajandus-ja-kutseline-kalapuuk/puugiandmed

Table 21: 2014 Estonian catch data for gillnets and traps in Lake Peipus (kg).

Species		Estonian name	Driftnet	Large mesh gillnet	Small mesh gillnet	Open water trap	Shallow water trap	Wing traps	Total Net + Trap	% of Total Net + Trap
Common bream	*Abramis brama*	Latikas	202	277,300	733	320,602	19	82,177	681,033	31.2
Perch	*Perca fluviatilis*	Ahven	139	1,361	3,550	225,047	326	368,137	598,560	27.5
Pike-perch	*Sander lucioperca*	Koha	4,297	423,424	62	83,323	5	22,323	533,433	24.5
Roach	*Rutilus rutilus*	Särg	14	372	93,474	76,344	52	42,680	212,936	9.8
Pike	*Esox lucius*	Haug	3,629	94,911	109	7,790	-	2,343	108,782	5.0
Burbot	*Lota lota*	Luts	64	521	113	12,704	15	6,466	19,883	0.9
Vendace	*Coregonus albula*	Rääbis	-	-	-	6,304	-	12,415	18,719	0.9
Crucian carp	*Carassius carassius*	Koger	4	273	2	1,382	-	17	1,678	0.1
Ruffe	*Gymnocephalus cernua*	Kiisk	-	-	-	36	-	1,495	1,531	0.1
White bream	*Biucca bjoerkna*	Nurg	20	8	623	241	-	110	1,002	0.0
Tench	*Tinca tinca*	Linask	-	1	-	782	-	5	788	0.0
Orfe	*Leuciscus idus*	Säinas	-	3	488	105	-	3	599	0.0
Peipsi whitefish	*Coregonus maraenoides*	Peipsi siig	-	98	4	228	-	133	463	0.0
European eel	*Anguilla anguilla*	Angerjas	-	-	-	32	-	6	38	0.0
Common carp	*Cyprinus carpio*	Karpkala (Sasaan)	-	-	-	22	-	-	22	0.0
Vimba bream	*Vimba vimba*	Vimb	-	-	-	10	-	-	10	0.0
									2,179,475	100.0

Key:
P1 Target species (N.B., SA3.1.3.1. requires that perch is considered as a main primary species in UoA 2, and pike-perch as a main primary species in UoA 1.)
P2 Main primary species
P2 Minor primary species
P2 Minor secondary species
Negligible species

Table 22: 2015 Estonian catch data for gillnets and traps in Lake Peipus (kg).

Species		Estonian name	Driftnet	Large mesh gillnet	Small mesh gillnet	Open water trap	Shallow water trap	Wing traps	Total Net + Trap	% of Total Net + Trap
Perch	*Perca fluviatilis*	Ahven	234	1,386	1,051	184,441	464	484,641	672,217	33.5
Common bream	*Abramis brama*	Latikas	362	266,539	1,291	287,508	52	74,521	630,273	31.4
Pike-perch	*Sander lucioperca*	Koha	7,183	274,303	265	73,149	5	17,834	372,738	18.6
Roach	*Rutilus rutilus*	Särg	8	555	88,091	82,974	128	34,120	205,876	10.3
Pike	*Esox lucius*	Haug	3,865	67,821	2,170	13,640	-	3,042	90,537	4.5
Burbot	*Lota lota*	Luts	92	5,498	59	7,070	15	4,243	16,977	0.8
Vendace	*Coregonus albula*	Rääbis	-	-	-	4,650	40	6,069	10,759	0.5
Ruffe	*Gymnocephalus cernua*	Kiisk	-	-	-	429	-	3,335	3,764	0.2
Crucian carp	*Carassius carassius*	Koger	16	703	95	2,195	-	48	3,057	0.2
Tench	*Tinca tinca*	Linask	-	3	-	546	-	53	602	0.0
White bream	*Biucca bjoerkna*	Nurg	47	25	124	76	-	5	277	0.0
Peipsi whitefish	*Coregonus maraenoides*	Peipsi siig	-	24	1	240	-	2	267	0.0
Orfe	*Leuciscus idus*	Säinas	-	3	-	156	-	30	189	0.0
European eel	*Anguilla anguilla*	Angerjas	-	-	-	28	-	2	30	0.0
Common carp	*Cyprinus carpio*	Karpkala (Sasaan)	-	-	-	5	-	-	5	0.0
Vimba bream	*Vimba vimba*	Vimb	-	-	-	3	-	-	3	0.0
									2,007,569	100.0

Key:
P1 Target species (N.B., SA3.1.3.1. requires that perch is considered as a main primary species in UoA 2, and pike-perch as a main primary species in UoA 1.)
P2 Main primary species
P2 Minor primary species
P2 Minor secondary species
Negligible species

3.6.2 Main primary species

3.6.2.1 Perch and Pike-Perch

SA 3.1.3.1 (MSC 2014) requires that pike-perch is considered as a P2 species in scoring UoA 1 (Perch), and that perch is considered as a P2 species in scoring UoA 2 (Pike-perch); in both cases, these were assessed as main primary species. Background information on these species is provided in the Principle 1 introduction (Section 3.5), earlier in this report.

3.6.2.2 Common bream (*Abramis brama*)

The following section is summarised from www.fishbase.org/summary/Abramis-brama.html.

Common bream is distributed across much of Europe and in to Asia: most European drainages from France to the White Sea basin. It is naturally absent from Spain, Italy and Scotland, and its northern limit in Scandinavia is Bergen (Norway) and 67°N (Finland). Common bream is most abundant in backwaters, lower parts of slow-flowing rivers, brackish estuaries and warm and shallow lakes, where they may form large shoals. Larvae and juveniles live in still water bodies. Small individuals feed on insects, particularly chironomids, small crustaceans, molluscs and plants, while larger specimens may feed on small fish. Common bream usually spawn in backwaters, floodplains or lakes shores with dense vegetation.

Catches of common bream in the assessed gillnet and trap net fishery have averaged 655 t for 2014-2015 (Table 21 and Table 22), and Estonian catches overall in the lake have increased in recent years, from an annual mean of 473 t for 2008-2011, to 649 t for 2012 -2015 (Figure 30). Common bream is managed through a TAC, and the recent increase in catches reflects an increase in the proportion of the TAC that has been taken (2008-2011 = 69%, 2012-2015 = 93%, and Figure 31, rather than an increase in the overall TAC. The TAC is closely monitored, however, and the data show that it has not been exceeded in any year (Table 23).

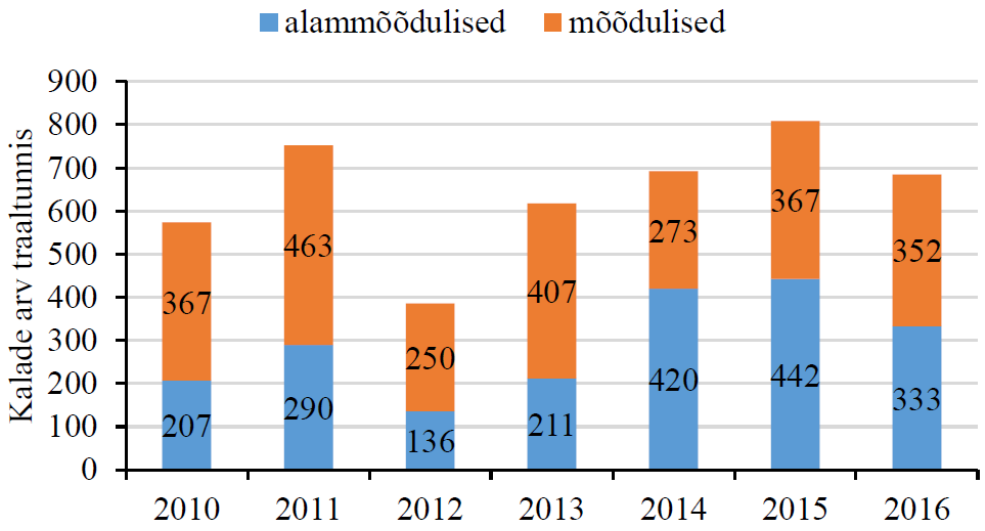

Figure 27: Common bream survey abundance (number per trawl hour) for undersize (alammõõdulised) and sizeable (mõõdulised) individuals, 2010-2016.
Source: (EMI 2017)

Stock status has improved in recent years, and is currently described as good, with stocks and yields at a high level (EMI 2017). The common bream population is currently estimated at 10.2 million fish,

comprising 10,200 t. Incoming year classes are abundant, and good catches are anticipated in the coming period (EMI 2017, Figure 27).

3.6.2.3 Roach (*Rutilus rutilus*)

The following section is summarised from www.fishbase.org/summary/Rutilus-rutilus.html.

Roach is distributed widely across Europe, eastward to the Caspian and Aral Sea basins, southeast to the Aegean basin and northeast to Siberia as far as the Lena drainage. Roach is found in a wide variety of habitats, mainly in lowland areas, but is most abundant in nutrient-rich lakes and large to medium sized rivers and backwaters. Larvae and juveniles live in wide variety of littoral habitats. Roach prey predominantly on benthic invertebrates, zooplankton, plant material and detritus, but they may shift from littoral to pelagic habitats and between benthic food and zooplankton as opportunity or need arises. This species spawns amongst dense submerged vegetation in backwaters or lakes, where the eggs may be found attached to vegetation and tree roots. Roach stays in backwaters or in deep parts of lakes to overwinter.

Catches of roach in the assessed gillnet and trap net fishery account for almost all the roach taken in the Estonian Lake Peipus fishery, and have averaged 210 t for the 2014-2015 period (Table 21 and Table 22). Annual catches in the overall Estonian fishery have remained steady at around 200 t for the entire 2008-2015 period (Table 23). Roach is managed through a TAC, and quota uptake has averaged 81%, with a somewhat lower proportion being taken in the most recent years (Figure 31).

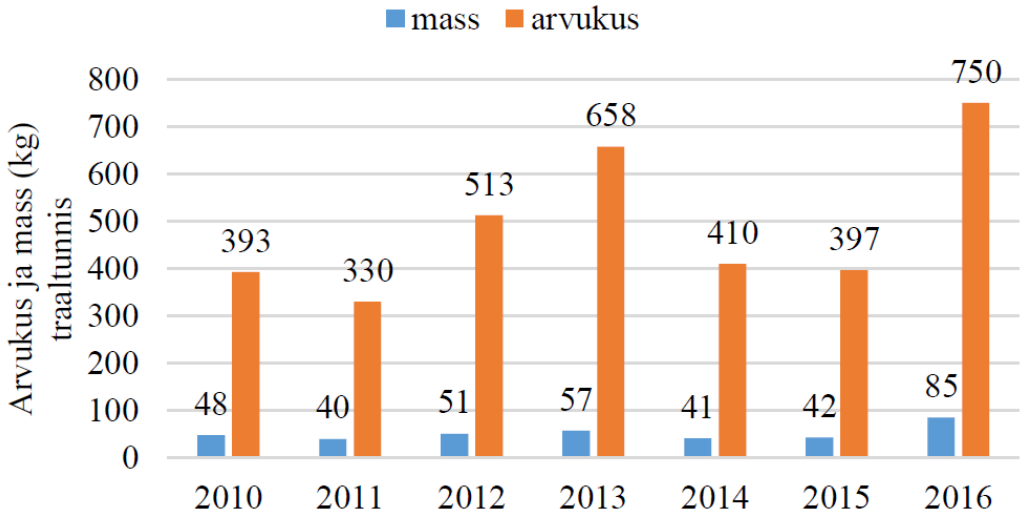

Figure 28: Roach survey biomass (mass) and abundance (arvukas) per trawl hour, 2010-2016
Source: (EMI 2017)

The roach stock has declined from a peak in 2005, but is currently in relatively good condition, above the level of recent years (EMI 2017, Figure 28). The stock mainly consists of the 2009-2011 year classes, with somewhat weak incoming year classes, probably because of low water levels (EMI 2017). It is noted that roach is an important prey species for pike-perch, perch and pike, but is also an important competitor of smelt and whitefish, and some consideration is being given to fishing roach harder in order to reduce this competitive role.

3.6.2.4 Pike (*Esox lucius*)

The following section is summarised from www.fishbase.org/summary/Esox-lucius.html.

Pike has a circumpolar distribution, and is found widely across North America and Eurasia, as far south as the Caspian and Aral Seas, and northeast to Siberia and the Bering Sea basin. Pike occur in clear vegetated lakes, quiet pools and backwaters of creeks and small to large rivers. They are usually solitary; adults feed mainly on fishes and cannibalism is common, but will also take frogs, crayfish and even ducklings. Eggs are deposited in flooded areas and on submerged vegetation over a period of 2-5 days.

Catches of pike in the assessed gillnet and trapnet fishery have averaged 100 t for 2014-2015 (Table 21 and Table 22). As for roach, the assessed fishery accounts for the vast majority of all Estonian commercial catches of pike from Lake Peipus, which have averaged 97 t for the entire 2008-2015 period (Table 23). Recent catches have been higher than previously, though, with an annual mean of 66 t for 2008-2011, and 122 t for 2012 -2015 (Table 23 and Figure 30). Quota uptake has been higher in general in the most recent years, with an average for the 2008-2015 period of 74% (Table 23).

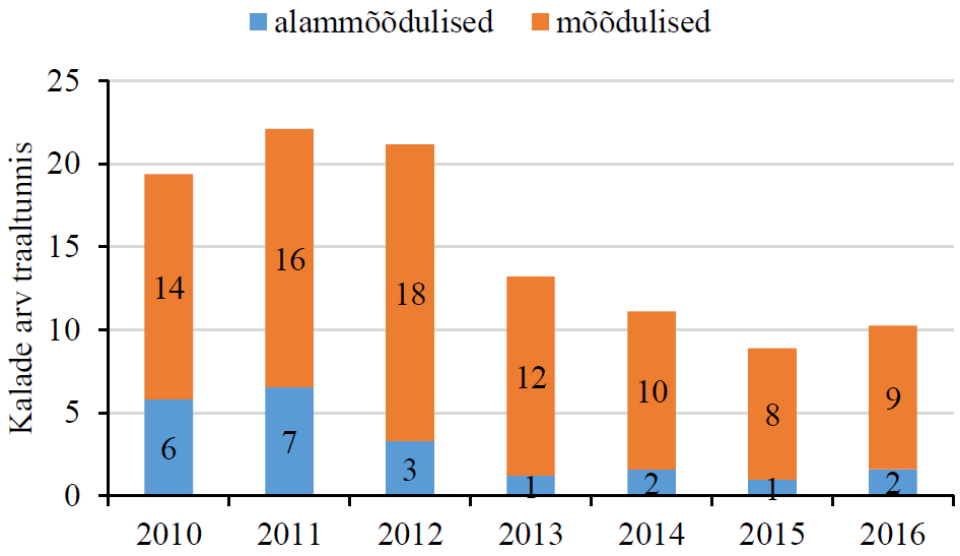

Figure 29: Pike survey abundance (number per trawl hour) for undersize (alammõõdulised) and sizeable (mõõdulised) individuals, 2010-2016.
Source: (EMI 2017)

Stock status is currently described as moderate, with the pike population made up of an estimated 0.64 million fish, comprising 1,400 t (EMI 2017). The population is now dominated by the 2009-2011 year classes, and yields in the coming period are expected to decline (and be managed accordingly) due to the 2014-2016 year classes being relatively weak as a result of lower water levels in the lake (EMI 2017 and Figure 29).

3.6.3 Minor primary species

Burbot (*Lota lota*) and vendace (*Coregonus albula*) are taken in small quantities in the Lake Peipus fishery, and each comprised just less than 1% of the catch in 2014 and 2015. The only other primary species taken in anything other than negligible quantities are ruffe (*Gymnocephalus cernua*) and Peipsi whitefish (*Coregonus maraenoides*); ruffe comprised around 0.1-0.2% of the catch and Peipsi whitefish made up just 0.01-0.02% of the catch in the most recent years (Table 21 and Table 22).

Burbot (summarised from www.fishbase.org/summary/Lota-lota.html): Burbot is a circumarctic species, and is the only member of the Gadidae (cod-like) family which lives in freshwater. Adults are found in well oxygenated flowing waters and large, deep lakes as well as large rivers with slow-moving current, but this species can be found from estuaries to upland streams. They seek shelter

under rocks, amongst tree roots or dense vegetation. Smaller individuals feed on insect larvae, crayfish, molluscs and other invertebrates, but larger individuals are increasingly piscivorous. Spawning occurs from November to March, at temperatures below 6°C and in groups of up to 20 interlaced individuals that form a spawning ball on the bottom.

Burbot catches in the assessed gillnet and trapnet fishery have averaged just over 18 t for the 2014-2015 period (Table 21 and Table 22), while the total annual Estonian catch from Lake Peipus has averaged just over 23 t for the period 2008-2015 (Table 23). The TAC was increased from 25 t to 50 t for 2013 and subsequent years, while the catch has declined slightly, so the catch as a percentage of the TAC has dropped in the most recent years (Figure 31).

In contrast to earlier times, the modern Lake Peipus is a eutrophic waterbody that experiences warm, low water levels in summer, with an abundance of algae and low oxygen levels. Conditions for burbot and other species that prefer cold, lower nutrient water are therefore currently poor, and major changes in this respect are not foreseen (EMI 2017). Burbot stock abundance within the lake is considered to be low (EMI 2017).

Vendace (summarised from www.fishbase.org/summary/Coregonus-albula.html): Vendace is found in the Baltic basin, lakes of the upper Volga drainage, and some lakes of the White Sea basin and North Sea basin east of Elbe drainage. It is anadromous in the Gulf of Finland and occurs also in the northernmost, freshened part of Gulf of Bothnia. Vendace forms pelagic schools in deeper lakes, feeding on planktonic crustaceans, and spawns on sand or gravel substrates at 3-10 m depth.

Vendace catches in the assessed gillnet and trapnet fishery averaged around 15 t for the 2014-2015 period (Table 21 and Table 22), while the total annual Estonian catch from Lake Peipus has climbed from 0 t annually from 2008-2010 to a peak of 22 t in 2014 (Table 23, Figure 31). This increase in the catch reflects an increase in the vendace population, which is recovering after a period of low abundance due to poor breeding conditions. For 2017, the stock condition has improved significantly (although is still considered to be low), and the TAC has been increased to 45 t, still reflecting a low fishing mortality rate of 0.1 (EMI 2017).

Ruffe (summarised from www.fishbase.org/summary/Gymnocephalus-cernua.html): Ruffe is widely distributed in Eurasia, extending from the North and Baltic Sea basins to the Caspian Sea and Aral Sea to the southeast, north to about 69° N in Scandinavia and then across northern Russia to the Kolyma drainage. It inhabits eutrophic lakes and lowland rivers, and tolerates estuarine conditions. In general, its abundance increases with increased eutrophication, and it feeds on zooplankton, chironomids, oligochaetes and amphipods, as well as small fish. Ruffe lay eggs in strands on rocks and weed in shallow water.

Annual catches in the assessed gillnet and trap net fishery averaged around 2.5 t for 2014-2015, while the average catch for the entire Estonian Lake Peipus fishery averaged almost 24 t for the 2008-2015 period. This reflects that ruffe catches in Lake Peipus have declined over time in response to a decline in the population of this species, but also suffered largescale mortalities in the early 2000s from which they have not recovered. Ruffe stock abundance is currently considered to be low (EMI 2017).

Peipsi whitefish (summarised from www.fishbase.se/summary/Coregonus-maraenoides.html): The Peipsi whitefish has a restricted distribution, being naturally present only in Lake Peipus and Lake Võrtsjärv. This species was introduced to Lake Burtneck (Latvia), and may now be found in the Gulf of Riga in the Baltic. Peipsi whitefish have been introduced to many lakes in northern Russia, Poland, Germany, Netherlands and Japan, but have become established only in a few. This species spawns mainly in southern coastal part of Lake Peipus and northern part of Lake Lämmijärv, but also enters some rivers to spawn.

Catches of Peipsi whitefish are controlled closely, and the current quota is 1 t per year, allowing for a small bycatch but no directed fishing (EMI 2017). Catches in the assessed fishery for 2014-2015 have

averaged 360 kg (Table 21 and Table 22). Quota uptake in the Estonian fishery as a whole has averaged 65% for the 2008-2015 period (Table 23). Environmental conditions in Lake Peipus for this species are currently considered to be very poor, with reduced periods of ice-cover and low dissolved oxygen levels in inshore spawning areas because of high levels of weed cover and algal decomposition. Consideration is being given to commencing artificial propagation to support the species (EMI 2017).

3.6.4 Minor secondary species

Crucian carp (*Carassius carassius*) is the only minor secondary species taken in anything other than negligible quantities, and comprised around 0.1-0.2% of the catch in the most recent years (Table 21 and Table 22).

Crucian carp (summarised from www.fishbase.org/summary/Carassius-carassius.html): Crucian carp is widely distributed across Eurasia, and is found from the North and Baltic Sea basins, south to the Aegean and Caspian Sea basins, and as far east as the Kolyma drainage in Siberia. In the Baltic basin it's distribution extends north to about 66°N. Adults occur in shallow ponds, lakes rich in vegetation and slow moving rivers. This species feeds mainly at night on plankton, benthic invertebrates, plant materials and detritus, and spawns in dense submerged vegetation.

Crucian carp is managed within a combined 50 t quota for 'other' species, and catches in the assessed fishery have averaged under 2 t for 2014-2015 (Table 21 and Table 22). The catch in these most recent years greatly exceeds the catch in the earlier years (Table 23).

3.6.5 Other species

Other species that are recorded in the catch from the assessed gillnet and trapnet fishery (e.g. tench, white bream, orfe, European eel, carp and Vimba bream) are taken in extremely small quantities. They are not considered further here or in scoring.

3.6.6 Management and fishery information

Management of the Estonian Lake Peipus gillnet and trap net fishery is multi-faceted, being based around the setting of species-specific TACs for the key species (assessed here as the primary species) and a combined TAC for the other species. Closed areas and closed seasons are also enforced to protect fish at spawning or when particularly vulnerable (e.g., around river mouths).

The TACs are set on the basis of an annual survey and assessment programme that includes four fishery-independent trawl surveys at standard stations (Spring – mainly for vendace, smelt, perch and pike-perch, June – mainly for pike-perch and vendace, August – mainly for bream, and October – mainly for pike-perch, perch, pike and roach). There are also scientific gillnet surveys to mirror the commercial fishery, and sampling of the commercial catch.

Catch data for the Estonian fishery are recorded at a high level of accuracy, and enforcement is undertaken at high intensity. All commercial vessels are required to have a working vessel monitoring system (VMS), and vessels must 'hail in' to report their catches and port of landing, at least one hour prior to landing. Penalties for failing to declare catches or inaccurate declarations (±10% of the actual weight) can be severe and are calculated on the basis of a fine per kilo of fish.

Catch data are uploaded rapidly to the central data hub, and quantities are deducted from the TAC quickly. Directed fisheries are typically closed when approximately 90% of the TAC is taken, allowing the room for the remainder of the TAC to be taken as bycatch when specifically targeting other species (typically by changing fishing location or mesh size).

On average 5% of all landings must be checked, but no less than 3% at any port. It was reported to the Assessment Team (I. Kask, pers. comm.) that in 2015, there were 11,000 fishing days, more than 1,000 landings inspections, with a focus on the higher risk locations (i.e., close to 10% overall).

Table 23: Estonian Lake Peipus catch data (all gears) and quota uptake for 2008-2015

	2008		2009		2010		2011		2012		2013		2014		2015		Mean annual catch 08-15 (t)	Mean % of quota taken 08-15
Species	t	% of quota	t	% of quota	t	% of quota	t	% of quota	t	% of quota	t	% of quota	t	% of quota	t	% of quota		
Perch	743.83	98.3	804.52	98.5	1,200.93	98.6	754.66	97.3	1,057.74	98.2	913.56	91.4	786.76	98.3	818.11	96.2	885.01	97.1
Pike-perch	619.39	93.0	652.53	90.4	505.74	94.7	669.12	94.5	643.14	94.4	637.04	98.0	599.33	92.2	419.63	64.6	593.24	90.2
Common bream	367.16	48.0	531.12	68.5	425.11	74.1	569.10	85.2	570.01	83.7	603.53	92.9	748.34	99.8	675.62	95.2	561.25	80.9
Roach	202.21	80.9	187.44	89.6	196.06	90.0	223.15	91.8	204.21	92.0	184.92	66.0	217.41	62.1	210.78	76.6	203.27	81.1
Pike	54.73	61.0	65.26	64.2	45.56	53.8	98.74	73.5	151.59	74.7	143.39	86.9	119.76	99.8	93.99	75.2	96.63	73.6
Ruffe	63.24	84.1	74.18	99.3	38.61	99.5	7.43	94.2	0.71	14.8	1.63	1.1	1.64	1.1	3.81	2.5	23.90	49.6
Burbot	24.83	76.2	26.59	90.3	26.26	91.7	29.88	92.9	20.71	84.2	23.17	46.3	19.90	39.8	17.01	34.0	23.54	69.4
Vendace	0.00	0.00	0.00	0.00	0.00	0.00	0.58	55.1	1.59	82.9	9.55	63.7	22.23	88.9	12.70	84.7	5.83	75.0
Peipsi whitefish	0.76	69.4	2.68	94.6	0.47	89.9	0.15	99.3	0.22	60.1	0.37	18.6	0.53	53.2	0.36	36.2	0.69	65.2
Crucian carp	0.02	n/a	0.02	n/a	0.01	n/a	0.01	n/a	0.11	n/a	0.30	n/a	1.68	n/a	3.06	n/a	0.65	n/a
White bream	0.02	n/a	0.19	n/a	0.15	n/a	0.17	n/a	0.25	n/a	2.33	n/a	1.04	n/a	0.34	n/a	0.56	n/a
Orfe	0.27	n/a	0.33	n/a	0.41	n/a	0.03	n/a	0.16	n/a	0.20	n/a	0.62	n/a	0.20	n/a	0.28	n/a
Tench	0.04	n/a	0.16	n/a	0.00	n/a	0.05	n/a	0.13	n/a	0.12	n/a	0.79	n/a	0.60	n/a	0.24	n/a
European eel	0.01	n/a	0.03	n/a	0.01	n/a	0.01	n/a	0.01	n/a	0.03	n/a	0.04	n/a	0.03	n/a	0.02	n/a
Carp	0.01	n/a	0.00	n/a	0.01	n/a	0.01	n/a	0.00	n/a	0.00	n/a	0.02	n/a	0.01	n/a	0.01	n/a
Prussian carp	0.00	n/a	0.00	n/a	0.00	n/a	0.00	n/a	0.00	n/a	0.00	n/a	0.01	n/a	0.01	n/a	0.00	n/a
Rudd	0.00	n/a	0.01	n/a	0.00	n/a	0.00	n/a	0.00	n/a	0.00	n/a	0.00	n/a	0.00	n/a	0.00	n/a

Key:
P1 Target species (N.B., SA3.1.3.1. requires that perch is considered as a main primary species in UoA 2, and pike-perch as a main primary species in UoA 1.)
P2 Main primary species
P2 Minor primary species
P2 Minor secondary species
Negligible species

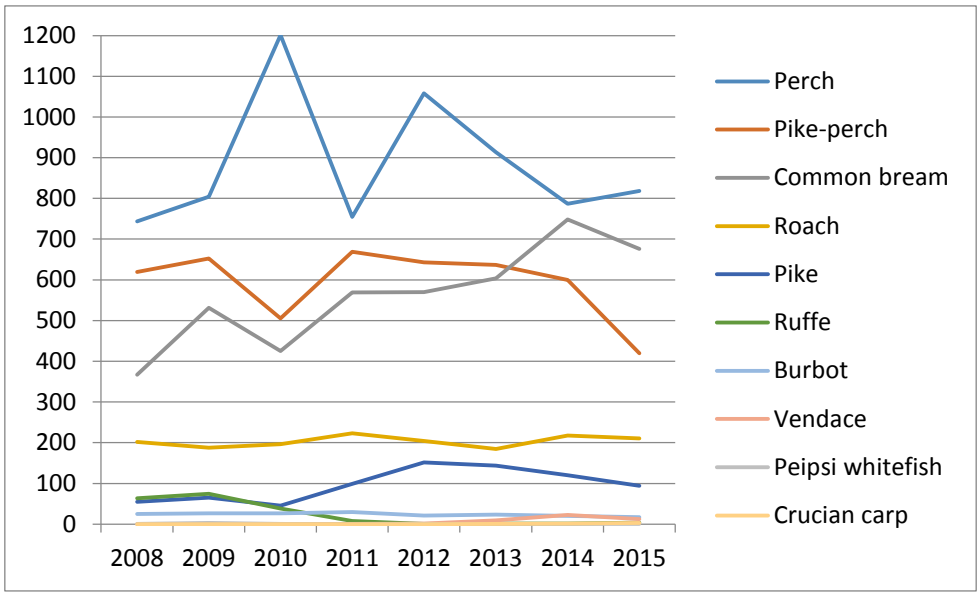

Figure 30: Estonian Lake Peipus catches (tonnes, for all gears) for 2008-2015.

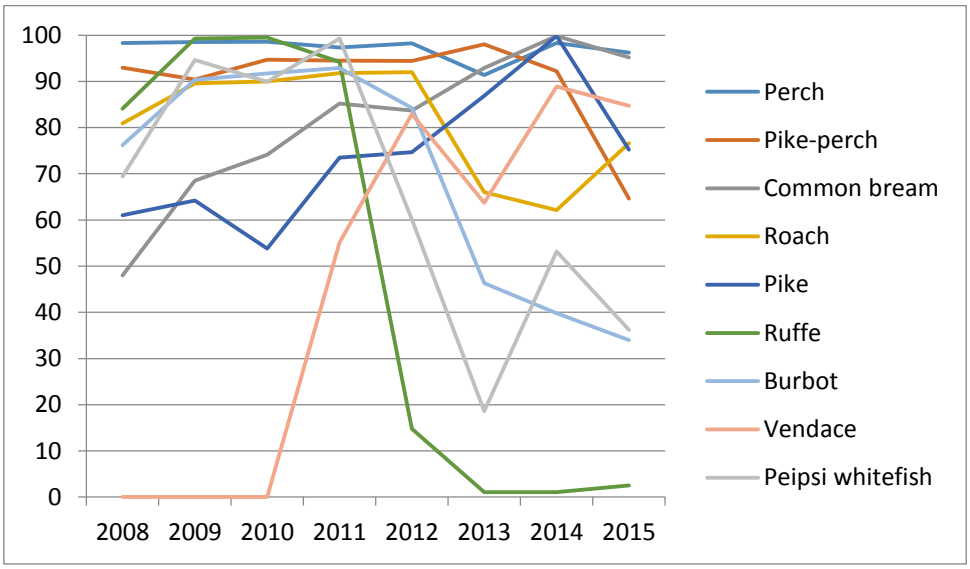

Figure 31: Estonian Lake Peipus quota uptake (percentage, all gears) for 2008-2015.

3.6.7 Endangered, threatened or protected species

ETP species are defined by the MSC (MSC 2014) as species that are:

i) Recognised by national ETP legislation,

ii) Listed on Appendix I of CITES (unless it can be shown that the particular stock of the CITES listed species impacted by the UoA under assessment is not endangered),

iii) Listed in any binding agreements concluded under the Convention on Migratory Species (CMS), or

iv) Classified as 'out-of scope' (amphibians, reptiles, birds and mammals) that are listed in the IUCN Red list as vulnerable (VU), endangered (EN) or critically endangered (CE).

ETP species inhabiting Lake Peipus that have the potential to interact with the assessed gillnet and trapnet fishery include various migratory and diving bird species, and lacustrine (lake-living) mammals and amphibians. Asp (*Aspius aspius*) and wels catfish (*Silurus glanis*) are fish species that are protected as Annex II species under the Estonian Nature Conservation Act (2004).

Every stakeholder questioned during the site visit (including representatives of the enforcement, science and NGO communities, as well as fishermen) stated that there are few if any interactions annually between the fishery and bird or mammal species. Why this was the case when was thought to be because of several reasons:

- The main migration period for birds was at times when the gillnet and trapnet fishery is constrained by the development of thin ice in the Autumn, or by melting ice in the spring.
- The large mesh gillnet fishery is not permitted within 1 km of the shoreline, and takes place in deeper areas where birds are less likely to forage.
- Mammals including beavers and otters are rarely observed in the lake, and no fishing is permitted within 500 m of any river mouth.

Asp (summarised from www.fishbase.se/summary/Leuciscus-aspius.html): Asp is a Eurasian cyprinid species, found in a number of large rivers draining to the northern North Sea, Baltic Sea, Black Sea, Sea of Azov and Caspian Sea, and the Aegean Sea basin. It occurs in open water of large and medium-sized lowland rivers and large lakes. They prefer to stay near cover and in deeper, overgrown parts of rivers and in quiet bays. This species is piscivorous, and while juveniles are gregarious predators, adults hunt in small groups or are solitary. They migrate upstream in tributaries for spawning in April-June, laying eggs in fast-flowing water on gravel or submerged vegetation.

Wels catfish (summarised from www.fishbase.se/summary/Silurus-glanis.html): Wels is a Eurasian catfish species that is found in the North, Baltic, Black, Caspian and Aral Sea basins, as far north as southern Sweden and Finland, and as far south as some rivers of the Aegean Sea basin. It inhabits large and medium size lowland rivers, backwaters and well vegetated lakes It is a nocturnal predator, foraging near bottom and in the water column. Larvae and juveniles are benthic, feeding on a wide variety of invertebrates and fish. Adults prey on fish and other aquatic vertebrates. Males defend small territories in the spawning sites and construct nests made of plant materials.

Asp and wels catfish must be returned to the water immediately after capture, although catches in the fishery of both species was reported by stakeholders to be very rare. There are no data on captures of either species as releases are not required to be recorded on the catch returns.

3.6.8 Habitats

Habitats and the macrozoobenthos of Lake Peipus have been studied since the 1930s by both Russian and Estonian scientists. Timm et al. (1996) described the lake environment, and stated that the bottom relief is quite uniform: the central part of Lake Peipsi has a mean depth of 8-10 m with only a few deeper oval hollows. A steep slope up from the deeper areas appears usually at about 2 km from the shoreline in Lake Peipsi and 0.5 km in Lake Lämmijärv and Pihkva. The distribution of bottom sediments is uniform. Sandy muds prevail in the shallow coastal regions, while the deep central parts are dominated by mud; these two substrate types are assessed as commonly encountered habitats. Cobbles and rocks that are locally present, mainly in the northern part at a depth of 2-7 m, are assessed as a minor habitat. Aquatic macrophytes cover at least 1.7% of the whole area, but are increasing, especially in the south and along the shoreline.

Studies of the lake over a long time period show that the benthos of the littoral zone (stones and muddy sand, with sparse macrovegetation) is more abundant than deeper areas, but that the biomass is similar to that in the deepest zones. The biomass of the benthos in the sandy areas in the

shallow sublittoral is considerably lower than elsewhere, being dominated by chironimids and oligochaetes, only (Timm *et al*. 1996).

3.6.8.1 Vulnerable Marine Ecosystems (VMEs)

Under CRv.2.0 (MSC 2014), the Performance Indicators (PIs) for habitats (2.4.1, 2.4.2, 2.4.3) include the requirement to consider the potential for fishery impacts on vulnerable marine ecosystems (VMEs), as well as management and information related to the issue. There are considered to be no VMEs in Lake Peipsi.

3.6.9 Ecosystem

To score the ecosystem PIs, it is helpful (but not an explicit MSC requirement) to define the ecosystem within which the fishery operates. The MSC does, though, require the 'key ecosystem elements' to be defined, and describes them as "*the features of an ecosystem considered as being most crucial to giving the ecosystem its characteristic nature and dynamics, and are considered relative to the scale and intensity of the UoA; they are features most crucial to maintaining the integrity of its structure and functions and the key determinants of the ecosystem resilience and productivity*" (SA3.16.3, MSC 2014).

The ecosystem of the Lake Peipus Perch and Pike-perch Fishery is considered to be Lake Peipus and its drainage. Stålnacke et al. (2005) then identified four major perceived transboundary problems related to ecosystem management of Lake Peipus. These were:

- Eutrophication of Lake Peipus (including riverine loads)
- Fishery management
- Groundwater pollution and water distribution in the Narva River region
- Mining pollution from oil-shale activities

Their results showed that the first issue was the main water related environmental issue of concern, in that eutrophication has influenced the biogeochemical cycles leading to undesirable states of nutrient concentrations in Lake Peipus, with secondary impacts upon fish stocks.

The findings of Stålnacke et al. (2005) are supported by other work, including that by Nõges & Nõges (2006) who undertook an evaluation of Lake Peipsi against the Water Framework Directive lake quality criteria and commented that "*eutrophication can be considered the most important and most universal reason of water quality degradation in lakes*", but that the fish community was considered to have a quality status of 'good', with "*no major changes in species composition* [and with] *abundance and age structure of commercial fishes* [that] *are intensively managed by fisheries*". Later work by Kangur et al. (2013) investigated long-term changes in the fish community of Lake Peipus, and noted that "*anthropogenic eutrophication remains the most serious environmental problem for Lake Peipsi, triggering changes in the entire ecosystem.*"

The key ecosystem elements for the Lake Peipus fishery is therefore considered to be water chemistry (eutrophication), and fish community structure and function as an associated key ecosystem element of particular relevance to the fishery.

3.7 Principle Three: Management System Background

3.7.1 Governance and Policy

The Unit of Assessment covers Lake Peipus, which lies on the border between Estonia, an EU Member State, and the Russian Federation (Russia). Lake Peipus is actually composed of three elements, Lake Peipsi (the northern main lake, although the name is also often used to refer to all three lakes together), Lake Lämmijärv (the middle water body) and Lake Pihkva (the southern lake, which is mostly Russian). As such, the perch and pike-perch stocks are shared between Estonia and Russia and are jointly managed by the Estonian-Russian Fisheries Commission (ERFC). The Unit of Assessment is limited to licensed commercial fishermen working legally in Estonian waters of Lake Peipus using gillnets and trapnets.

On the Estonian side the lake is bordered by four counties (from north to south):

1. Ida-Viru (administrative capital Jõhvi)
2. Jõgeva (administrative capital Jõgeva)
3. Tartu (administrative capital Tartu)
4. Põlva (administrative capital Põlva)

On the Russian side the lake comes under the main jurisdiction of the Pskov Oblast, whose administrative centre is the city of Pskov, although the entrance to the outflow of the Narva River lies in the Leningrad Oblast to the north-east.

There are only two large towns in the basin: Pskov in the Russian Federation, with 204,000 inhabitants, and Tartu in Estonia, with 98,000 inhabitants. The majority of the basin population lives in small settlements. Only 27,000 people live in the local municipalities bordering the lake on the Estonian side. On the Russian side, the Leningrad region had 60,600 inhabitants in 2001, 87 percent of them urban dwellers. Of the 427,000 residents of the Pskov region, almost half live in Pskov itself.

The total number of professional fishermen on Lake Peipus is currently estimated to be approximately 450 in Estonia and 700 in Russia. In Estonia, there are 82 entrepreneurs (mostly joint-holding companies) who are engaged in the fishery (Säre *et al*. 2010). Nine bigger entrepreneurs are responsible for almost 65% of the total catch in Lake Peipsi and they employ 188 fishermen (Säre et al. 2010).

It is likely that that number of Estonian fishers will continue to decrease in coming years following recommendations of fishery scientists; and caused by restriction of quota (Säre et al. 2010).

The following groups have interests in the fishery:

- Local people of the area for whom the fishery provides employment opportunity for about 450 fishers in Estonia and 262 people involved in fish processing in the region (Säre et al., 2010). Most of these people are local.
- Recreational fishermen from the surrounding areas who fish in the Peipus Lake because it is the largest freshwater body in this area. The fisheries of Lake Peipsi can be separated into two distinct fisheries that take place at different times of the year. For the most part of the year (April-November) the commercial fishers predominate. From late November through to late March the lake is generally frozen over and the most visible form of fishing are the ice fishing activities.

3.7.2 Legal framework

The legal framework relating to fisheries management needs to be considered at two levels, *national* (Estonia and Russia) and *trans-boundary*.

3.7.2.1 National

The management of fisheries is divided between two bodies in Estonia, the Ministry of Rural Affairs and the Ministry of the Environment.

- The *Ministry of Rural Affairs* is responsible for the development of the market organisation system, the award of structural supports and state aid, the management of aquaculture sector, commercial fishing (including issuing permits for commercial fishing, managing a national registry of fishing vessels and catch accounting).
- The preparation and implementation of the Policy on the Protection and Use of Fishery Resources, including the reproduction of fish stocks and the protection and restoration of spawning grounds and habitats, are managed by the *Ministry of the Environment (MoE).* The MoE also provides permits for scientific research and special purpose fishing. Two bodies with the MoE also have particular functions related to fisheries:
    - The monitoring of fishing activities is carried out by the *Environmental Inspectorate* belonging to the area of government of the Ministry of the Environment.
    - Recreational fishing card is provided and recreational fishing data are collected by the *Environmental Board*.

The current national fisheries legislation in Estonia is the *Fishing Act (2015).* The stated purpose of this act, which explicitly covers both territorial and EEZ waters, is threefold, as follows:

1) Ensure conservation and economic use of fish and aquatic plant resources on the basis of internationally recognized principles of responsible fisheries;
2) Ensure reproduction capacity of fish and aquatic plant resources and productivity of bodies of water;
3) Avoid undesirable changes in the ecosystem of bodies of water.

The Act also specifically mentions TAC setting on Lake Peipus in Art. 47, stating that "*Based on the Agreement between the Government of the Republic of Estonia and the Government of the Russian Federation on Cooperation in Conservation and Use of Fish Resources on Lake Peipsi, Lake Lämmijärv and Lake Pskov, the Government of the Republic shall establish by a regulation the allowable annual catches allocated to the Republic of Estonia on Lake Peipsi, Lake Lämmijärv and Lake Pskov by species of fish within 60 working days after allocation of allowable total catches between the parties at the Intergovernmental Commission on Fishing on Lake Peipsi, Lake Lämmijärv and Lake Pskov, and the allowable annual catches per species of fish may also be established on a half-year basis*".

In addition to the Fishing Act (2015), there are three other pieces of primary legislation that are related to freshwater fisheries:

- *Fishing Rules (1996).* The procedure for fishing on all water bodies and the procedure for collecting aquatic plants determine: closed seasons for fishing, and prohibited areas; minimum fish sizes and the conditions for bycatch; restrictions on and requirements for fishing gear and methods; fishing gear types and specifications; requirements for marking fishing gear; and the method for calculating the proportion of Baltic herring and sprat in trawl catch. These rules were last updated in January 2017.
- *Fisheries Market Organisation Act (2015)*: Is largely directed at regulation of the post-harvest value chain. It does, however, include a requirement (from a directive for an advisory Fisheries Council) that the Ministry of Rural Affairs will, amongst other things, make proposals for the implementation of measures necessary to develop the production of fishery and aquaculture products, in particular through EMFF funding (see below). It also formalises the recognition of Producer Organisations.
- *Environmental Supervision Act (2001)*: Supervision of fishing in waters outside the territorial jurisdiction of the Republic of Estonia is covered by the provisions of the Environmental Supervision Act (last updated in June 2014). Supervision over fulfilment of the requirements

of legislation regulating fishing and the conditions designated in a fishing permit, even in waters outside the direct jurisdiction of the Republic of Estonia, are exercised by the Ministry of the Environment. The Ministry's main implementing body is the Environmental Inspectorate who are responsible for controlling the use of illegal fishing gear and protecting fisheries resources.

Estonia has been a Member State of the *European Union* (EU) since 1 May 2004, and its fisheries are therefore subject to the principles and practices of the EU's *Common Fisheries Policy* (CFP). The Lake Peipus fisheries are managed through the CFP in accordance with the basic fisheries regulation. This said, unlike marine aquatic resources which are managed under the CFP, inland fisheries are, on the whole, managed by national legislation (Newman 2014). Nevertheless, while inland fisheries are not managed by the rules of the CFP, it does apply to anadromous and catadromous species during the marine part of their lifecycles.

The *Water Framework Directive* (WFD) (2000/60/EC) is another major driver for achieving sustainable management of water resources throughout Europe, and thereby the conservation of Europe's freshwater and diadromous fishes and the fisheries that rely on them. It requires all inland and coastal waters within defined river basins to reach good ecological status by 2015. The WFD includes requirements for increased monitoring of aquatic ecology by Member States and improved protection and recovery of water bodies. It specifically addresses transboundary Member States, specifying, where international rivers or freshwater basins extend beyond the boundaries of the Community (such as Lake Peipus), Member States shall endeavour to coordinate with the relevant non-Member State, with the aim of achieving the objectives of this directive throughout the respective freshwater basin.

Despite not regulating inland fisheries, except for some diadromous species described above, the CFP does provide support for commercial inland fisheries under the financial instruments (previously the EFF and now the *European Maritime and Fisheries Fund* EMFF). Article 44 of the EMFF (Council Regulation (EC) No 508/2014) aims to provide support for commercial inland fisheries, covering such investments as:

- The promotion of human capital, job creation and social dialogue;
- On-board or in individual equipment;
- In equipment and types of operations as referred to in Articles 38 (e.g., increased selectivity and reduced impact on habitats, mammals and birds) and 39 (innovations for marine biological resource conservation);
- The improvement of energy efficiency and the mitigation of the effects of climate change;
- The improvement of the value or quality of the fish caught.
- In fishing ports, shelters and landing sites;

Additionally, Article 44 sets out measures intended to protect and develop aquatic flora and fauna, where the EMFF may support the participation of inland fishermen in managing, restoring and monitoring Natura 2000 sites (i.e., Special Areas of Conservation (SACs) that are designated through the Habitats Directive, and Special Protection Areas (SPAs) that are designated through the Birds Directive), where these areas directly concern fishing activities as well as the rehabilitation of inland waters, including spawning grounds and migration routes for migratory species.

In addition to national legislation, a number of EU policy instruments exert influence over the conservation of freshwater species and habitats and consequently the management of European inland fisheries. The *Habitats Directive*, which aims to protect natural habitats and wild species other than birds, equally applies to the EU freshwater, terrestrial and marine environments.

3.7.2.2 Transboundary fisheries governance

Due to the transboundary nature of Lake Peipus a number of bilateral agreements have been signed between the Estonian and Russian governments. These include the following.

- Treaty between the government of Estonia and the Russian Federation entitled the '*Agreement on the Protection and Regulation of the Use of Fish Resources of Lake Peipsi, Lake Lämmi and Lake Pihkva*', concluded on 4 May 1994 in Moscow. This agreement is the core means by which Estonia and Russia regularly discuss and agree on common needs for fisheries management, scientific research into fish stocks, TAC setting, fisheries regulations and trans-boundary management concerns. It does not, however, cover wider environmental and habitat management of the lake.
- In 1997, five years after the border between Estonia and Russia was re-established, the riparian governments signed an '*Agreement on the Protection and Sustainable Use of Transboundary Water Bodies'*. An intergovernmental commission was established to co-ordinate the implementation of this agreement. Members of the Joint Commission include representatives from the Ministries of the Environment and Foreign Affairs, border guards and regional and local authorities to ensure that different perspectives are represented. The remit of the Joint Commission covers environmental monitoring, scientific research and coordination of relevant agencies and activities in Estonia and Russia.

3.7.3 Rights and dispute resolution

In Estonia, the Ministry of Environment states that (i) the definitions, rights and obligations of commercial fishermen and recreational fishermen have been structured according to the national legislation and that (ii) traditional fishing opportunities have been consolidated and enlarged for Estonian fishermen (MoE 2016). Fishing opportunities (e.g., in the form of gear-specific permits) are allocated according to historical rights. These are handed down through families or can be sold on the open market. As such, there is a system to observe the legal rights and these are generally consistent with P1 (e.g., number of gear units permitted) and P2 (e.g., specific gears, with the related conservation-orientated fishing rules). It was observed that, because of the link to historical rights, it can be difficult for new entrants to join the fishery as a licensee but it was easier to join a fishing company and operate under their license (Andrey Ulukhaniyants, pers. comm., 17 October 2016). There are a number of ethnic minorities around the lake – most specifically the Setu and the 'Russian Old Believers'. It is not believed that they are discriminated in any way in terms of access to fishing rights (Margit Sare, pers. comm., 19 October 2016).

Any issue relating to fisheries allocations (e.g., TAC / permits) and conservation (e.g., fisheries rules) can be taken to a court of law. This is a transparent civil law system that accepts compulsory International Court of Justice (ICJ) jurisdiction with reservations. Estonia has a Supreme Court and subordinate courts (circuit (appellate) courts; administrative, county, city, and specialized courts. Estonia has one of the highest disposition times at 146 days (this is the number of unresolved cases divided by the number of resolved cases at the end of a year multiplied by 365 days) and has a high clearance rate at 91% (e.g., the length of proceedings is linked to the rate at which cases are resolved by the courts (Beke *et al*, 2014). When the rate is about 100% it means that judicial systems are able to resolve at least as many cases as come in). Between 2010 and 2013, infringement procedures on average took 23 days.

3.7.4 Roles and responsibilities

The **management of fisheries** is divided between two bodies in Estonia, the Ministry of Rural Affairs and the Ministry of the Environment, whose respective roles are clearly spelled out in the Fishing Act (2015). The *Ministry of Rural Affairs* is responsible for the broad governance of the sector e.g. registration of vessels, catch accounting and commercial fisheries licensing) whilst the *Ministry of*

Environment is responsible for the day to day management of these fisheries. MoE's responsibilities include:

- Assessment of the condition of fishery resources, organising related scientific research, laying down the technical measures for the protection of fishery resources and determining catch quotas and fishing effort restrictions (MoE Fisheries Resources Department)
- Organising the reproduction of fishery resources by breeding and the restoration of fish spawning grounds and habitats;
- Organising recreational fishing (via the *Environment Board*);
- Habitat and species conservation through the Nature Conservation Department of the Environmental Board
- Managing supervision over the use of fishery resources and natural environment, including natural water bodies (via the Environmental Inspectorate). The Environmental Inspectorate has a 'Fisheries Section' whose headquarters I in Tallinn, but also has a sub-office in Mustvee on the NW coast of Lake Peipus.

The fishers in Estonia are organised into a number of different associations. These include:

- *Estonian Fishermen's Association*: most of Estonian fishers are members of the Estonian Fishermen's Association, with its headquarters in Tallinn. The Estonian Fishermen's Association comprises 6 sections: distant-water fishery; Baltic cod fishery; open Baltic trawl fishery; coastal Baltic trawl fishery; Baltic coastal fishery; and the inland water fishery (Lakes Peipsi and Võrtsjärv).
- *Estonian Association of Fisheries* (inc. Logi-F): fish processing. See http://www.kalaliit.ee/?structure=003

There are also dedicated Estonian fisheries associations on Lake Peipus. These include:

- *Union of Fishermen of Peipsi Basin*: represents around 63% of fishing gears on the lake. The Union meets around 7-8 times a year. In the past the Union has agreed unilateral fisheries rules (often with other associations) – for instance in 2016 a ban on trap net fishing in the summer was agreed with the other associations, even though the gear was legal at that time. A voluntary ban on Danish seine fishing was also agreed five days before the official close of the Danish seine season in order to protect fish for the other fisheries/gears - i.e., gillnets, trapnets. The Chairperson of the Union of Fishermen of Peipsi Basin is also an official member of the Estonian delegation to the ERFC.
- *Association of Lake Peipsi Fishermen*: represents about 34% of the fishing gears,
- *Union of Peipsi Region*: represents about 1% of the fishing gears.

The role of these Estonian associations is partially to allow access to local and EMFF financial assistance, as well as to provide a voice to commercial fishermen. They are able to meet formally and informally with the Fisheries Council, especially in the lead up to the annual ERFC meeting. Whilst broadly representative of the lake's fishers, there may be some internal division resulting from competing issues e.g. the Danish seine fishery versus others (Andrey Ulukhaniyants, per., comm., 17 October 2016). There is a formal agreement the MoE and the fisheries associations for the joint stewardship of fisheries in Lake Peipus (signed in 2010).

There is a formal process by which fisheries associations can make representations or present complaints to the Government e.g. the MoE. The Ministry is required to reply in writing within one month, but it is usually faster (Urmas Pirk, pers. comm., 19 October 2016). Letters can be addressed at different levels, depending on the level of concern – they can go to the Minister or even be sent to the Government (Estonian Parliament or *Riigikogu*) if necessary.

The Government was taken to court over a fisheries issue once in early 1990s, but not since (the Chief Fishery Inspector allowed a Danish seine fishery to occur during a ban).

There is also a Fisheries Local Action Group (FLAG), initially formed under Axis 4 of the European Fisheries Fund (EFF). The 'MTÜ Peipsi Kalanduspiirkonna Arendajate Kog' (Development Association of Peipsi Fishery Area). Whilst the FLAG is mainly geared towards community-led development of fishing areas, formerly through the EFF and likely through the EMFF in future, they also interact with technical specialists from the MoE in the lead up to the ERFC annual meeting to present and defend fisherman's positons on quotas and fisheries regulations.

3.7.5 Russian fisheries management

In Russia, the *Federal Fisheries Act on Fisheries and Conservation of Aquatic Biological Resources (N 166-FZ 2004)* and its updates (most recently in November 2014) outline the overarching goals of fisheries in Russia. Under this Act, the focus of fisheries is the protection and rational use of aquatic biological resources. It also outlines the rights of individuals, organisations and associations to have the right for the participation in fisheries-related management decisions. Order 104 (FFA 2015) also states upfront that "*Justification of the TACS shall be carried out in accordance with the principles of the precautionary and ecosystem approaches, the concept of maximum sustainable yield (MSY) and aimed at ensuring the sustainable development of fisheries*". The Law "On Protection of the Environment" (2001) contains a number of articles related to fisheries.

Russian fisheries management is organized through a common coordinating agency, the ***Federal Fisheries Agency*** (FFA; or *Rosrybolovstvo*), which has operated with executive power since May 2012 under the Russian Ministry of Agriculture. The FFA administers federal law and policy on fisheries on a region-by-region basis. Their responsibilities are organized on a clearly defined fishery-zone basis, in the case the Pskov region of the North-west territorial management Rosrybolovstvo. The *Ministry of Natural Resources* (RosPrirodNadzor) conducts an independent review of the annual TACs via the State Ecological Expertise. The *State Research Institute of Lake and River Fisheries* (GosNIORH) is also a key research institution covering fishes in NW Russia, including Lake Peipsi. Both the FFA and the GosNIORH are key members of the Russian delegation on the ERFC.

The Joint Russian-Estonian Commission on the Protection and Rational Use of Transboundary Waters has recently been restructured (UNECE, 2009). There are now two working groups instead of four, and therefore the scope of activities for each group has broadened. The working group on cooperation with local authorities, NGOs and international organizations which existed in the period 1999–2004 was abandoned, although its functions were transferred to a new group. The public is not directly involved in the work of the Commission, although experts (including NGOs) may take part in meetings of the working groups. Although the Agreement of 1997 lacks specific reporting requirements, strengthening the reporting mechanisms and dissemination of reports could contribute to the effectiveness of cooperation. There is a need to develop the cooperation between two commissions, the Joint Russian-Estonian Commission on the Protection and Rational Use of Transboundary Waters and the Russian-Estonian Intergovernmental Commission on Fisheries.

In Russia, the Federal Fisheries Act on Fisheries and Conservation of Aquatic Biological Resources (N 166-FZ 2004) outlines the rights of individuals, organisations and associations to have the right for the participation in fisheries-related management decisions. Russian fishers in Lake Peipus are represented by the association' *Pskov rybopromyšlenniki'*.

3.7.6 Consultation and participation mechanisms

In Estonia, the Fisheries Council provides a forum for government (research, management and control) and private sector to discuss and agree management system changes in advance of the annual ERFC meetings. The Fisheries Council is supposed to meet four times a year (Fisheries Market Organisation Act, 2015), and whilst this does not always happen, it meets formally at least once a year. The Fisheries Council allows all participants to contribute to the ERFC annual management decision-making. The high level of association membership (>95% gear use include in membership) suggests that there is an opportunity and encouragement for involvement by all.

3.7.7 Long-term objectives

The *Estonian Fisheries Strategy* (EFS) for 2014–2020 (the Fisheries Council of the Ministry of Rural Affairs approved the strategy on 2 April 2013) explicitly mentions an ecosystem approach to fisheries management in Estonia. MoE also states that "*The strategic goal of fisheries is to guarantee the good condition of fish populations and the diversity of fish species*" and goes on to say "*It is vital to avoid the negative effect fishing has on the ecosystem. Fish populations are considered to be in good condition when fish resources can reproduce themselves naturally in the existing environmental conditions and when the species have a characteristic age structure despite the pressure of commercial fishing*" (MoE, 2016).

The FLAG has also produced a 'Lake Peipus Fisheries Strategy 2015-2023' (PKAK 2015). Whilst this includes a vision for a clean natural environment with well-conserved fish stocks, it is essentially a plan for community-led development rather than fisheries management.

The stated purpose of the recently revised Fish Act (2015) is to (i) ensure conservation and economic use of fish and aquatic plant resources on the basis of internationally recognized principles of responsible fisheries; (ii) ensure reproduction capacity of fish and aquatic plant resources and productivity of bodies of water; and (iii) avoid undesirable changes in the ecosystem of bodies of water.

The use of annually-evaluated TACs, allied with a comprehensive control system (both unusually for an inland lake) suggests that a precautionary approach is implicit in the management system. Indeed there is evidence of a precautionary approach in the way the fisheries are currently regulated e.g., the use of 130 mm mesh size of gillnets in the large-mesh fishery targeting pike-perch, and this does not catch fish down to the 46 cm MLS (i.e., the mesh size could be reduced further).

3.7.8 Fisheries-Specific Management

Fisheries management in Lake Peipus is driven by the ERFC. The ERFC agreement (1994) includes an over-arching objective of "recognizing its shared responsibility for conservation of Lakes Chudskoe (Peipsi), and Pskov Lakes on the basis of mutual interest in the rational use of fish resources in these lakes, intending to join efforts for the conservation, rational use and management of fisheries resources" (English translation from the original Russian). This suggests that a long-term objective for both P1 (the fisheries resources) and P2 (conservation) are both explicit.

The annual protocols by the ERFC also includes short-term objectives in terms of fishing effort (e.g., number of fishing permits to be used) and fishing mortality (via the annual TACs). Whilst the short-term objectives are measurable and indeed annually reviewed, the long-term objective is not.

3.7.8.1 Decision-making processes

Decision-making in these fisheries is based around the annual ERFC meetings. These used to be twice a year, with the main decision-making session in November and a spring meeting to evaluate stock status and fisheries regulation needs. This spring meeting is now implemented through remote bilateral discussions. The process of the ERFC decision-making is as follows:

The *Estonian national science team* (MoE and academic scientists e.g. from the University of Tartu) agree on management needs and research priorities. This preliminary position is then sent to the Ministry of Rural Affairs and the inspectorates for review, and then a national position is adopted (an agenda is publicised, but the proceedings are an internal document). This is then presented to the Fisheries Council a week before the main ERFC meeting event. This one day event – which is publicised in advance - is an open public consultation, attended by all the Peipsi fisheries associations, with around 30 – 40 persons regularly attending. The Fisheries Council will then attempt to finalise the Estonian positon at the meeting, although sometimes it is not fully agreed, so

agreed at a higher level. This will include recommendations on the TACs, number of gear units and technical measures.

On the Russian side, the FFA and State Research Institute of Lake and River Fisheries (GosNIORH) also prepare their recommendations for stock status and management needs, including TACs. These are then sent to the State Ecological Expertise for review before being finalised.

The annual ERFC is normally held in November and is undertaken over a five day process. Whilst there is no formal prior exchange of positions, there are informal discussions and thus a reasonable understanding of the relative positions before the meeting. The ERFC is under taken both in plenary and with side meetings on specific technical issues. A formal meeting 'protocol' is prepared over the duration of the meeting, and is disused and approved on a preliminary basis by the end of the last day. The preliminary protocol then goes back to the MoE in Estonia before being formally approved in December, although the Estonian Minister for the Environment does not have the power to veto the Commission's decision. The protocol is binding for Russians immediately after the ERFC meeting. The annual TACs then become active on the first day of the following year. Progress is then reviewed in the Spring, and adjustments agreed where necessary.

3.7.9 Monitoring, Control and Surveillance

3.7.9.1 MCS Implementation

Monitoring, Control and Enforcement (MCS) is undertaken both on a national basis and through bilateral management under the ERFC. As a national level the Estonian Environmental Inspectorate (EEI) is responsible for both planning and implementing MCS. The EEI produces an annual work plan, with specific activities and targets set for each of the four county offices. This covers vessel authorisation (inspected on the lake and at port), fishermen's fishing authorisations, landings authorisation, recreational fishing rights, fish sellers and markets, recreational fishing rights and inspections over open and closed seasons. The MCS plan normally includes at least three major surveys, with specialist sub-plans focusing on critical issues such as protecting spawning periods, for both perch and pike perch. The overall target is that 5% of fishing trips are inspected on the lake, and at least 3% of landings are also inspected. In 2015, 488 inspections were carried out on the water and a further 658 on land (Table 24). This is out of around 11,000 fishing trips (Ivo Kask, pers. comm., 20 October 2016), suggesting an overall inspection rate (of fishing and landings activities) of around 11%.

Table 24: Number of fisheries inspections undertaken by the MoE Environmental |Inspectorate (2010-2016).
(Source: Estonian Environmental Inspectorate, unpublished)
Data for 2016 as of 1ST November 2016

Inspection type	Year						
	2010	2011	2012	2013	2014	2015	2016
Inspections on lake	584	694	801	898	753	488	516
Landings inspections	255	563	665	661	1083	795	658

Lake Peipus being a transboundary lake, the EEI work closely with the Police and Border Guard Board (PBGB). Both EEI and PBGB officers are fully gazetted enforcement officers. All EEI officers undertake a six month training course on the fisheries regulations, inspection processes and procedures and arrest protocols. They then undergo examinations before being fully gazetted. Officers can stop fishing, arrest fishermen, seize vessels and gear, and confiscate the catch where appropriate. The

PBGB officers are mainly tasked with cross-border surveillance, but will report illegal fisheries activities to the EEI when seen.

The EEI have four large (c. 8m) patrol vessels, four smaller rigid inflatable boats (RIBs) of 5-6 m, snowmobiles and patrol vehicles. The large vessels are equipped with net haulers and equipment to assist the seizing of large gear. Officers may be armed, but Lake Peipus is considered a low risk area.

In Russia, enforcement of fishery laws is under the responsibility of a separate service, the Federal Security Service (FSB), working with the Pskov Oblast. The Ministry of Agriculture also coordinates the work of the Federal Service of Veterinary and Sanitary Inspection (RosSelkhozNadzor), which is responsible for quality/health inspections of landed fish products before they are moved into domestic or export markets.

There are no formal joint patrols or operations between Estonia and Russia, but each side can observe activities as part of the ERFC agreements. Estonian fishers are not allowed to fish in Russian waters, and *vice versa*. All vessels are equipped with a vessel monitoring system[2] (VMS) and any attempt to fish across the border would be detected and acted upon immediately. There are regular cross-border reviews of VMS data, and the ERFC reviews enforcement activities and effectiveness on an annual basis.

3.7.9.2 Sanctions

Sanctions for fisheries offences can be administrative or criminal, and can be applied to most infringements described in the Fisheries Act. For a private person, the maximum penalty for a CFP infringement can reach up to €1,200, and for a legal person up to €3,200. In addition, sanctions could also include a fee for the damage done to the environment, for example to fish stocks. The penalties for infringements are assessed from the estimated impact of the illegal activity – catch values are estimated from a standard table (i.e., €xx per fish of each species), but if the damage is estimated to be >€4,000, then it will go to court; if less, there would be an administrative penalty. Tickets are issued and are required to be paid within 15 days. The permanent confiscation of gear and catch can be ordered by a Court or an extra-judicial body under the provision of the Estonian Criminal Code (art. 83). Since 2010, there have been 543 administrative penalties levied against fishers on Lake Peipus (approx. 90 per year) and 14 criminal cases (Table 25).

Table 25: Number of administrative penalties and criminal cases against fishers on Lake Peipus (2010-2016).
(Source: Estonian Environmental Inspectorate, unpublished)
Data for 2016 as of 1 November 2016

Sanction type	Year					
	2011	2012	2013	2014	2015	2016
Administrative penalty	54	97	155	130	63	44
Criminal cases	2	1	4	4	1	2

Of the 14 criminal cases between 2010 and 2016, there was one conviction, two acquittals and one termination of the criminal proceeding by the court due to the negligible guilt and the lack of public interest. The rest of the cases are still ongoing.

[2] Since 2011 for Danish seine vessels and 2015 for all other commercial fishing boats)

According to EEI officials (Ivo Kask, pers. comm., 20 October 2016), Lake Peipus is a relatively low risk location. The number of administrative penalties has diminished in the last two years since the introduction of VMS across the fleet.

3.7.10 Monitoring and Evaluation

Lake Peipus fishery management undergoes a detailed annual review through the auspices of the ERFC. This entails both countries monitoring catches, fishing effort and stock status indices in order to agree on revisions to TACs, technical measures and the next year's research and monitoring programme. This evaluation process is detailed in Section 3.7.8.1, above, but essentially involves both a national position setting process and bilateral discussions and agreements. Whilst this is mostly internal e.g. via MoE and the FFA, there is a degree of external evaluation by the Fisheries Council in Estonia and the State Ecological Expertise in Russia. There have also been the occasional external evaluation by external scientists, such as that by Bobrev *et al*, 2013.

4 Evaluation Procedure

4.1 Harmonised Fishery Assessment

The MSC has detailed an approach to addressing the assessment of overlapping fisheries, where 'overlapping fisheries' are defined as '*Two or more fisheries which require assessment of some, or all, of the same aspects of MSC Principles 1, 2 and/or 3 within their respective units of certification*' (MSC 2015). This approach includes that:

"*PB3.1 CABs assessing overlapping fisheries shall ensure consistency of outcomes so as not to undermine the integrity of MSC fishery assessments.*

PB3.2 Where assessments of two or more fisheries occur at the same time, CABs shall coordinate their assessments so as to make sure that harmonisation of important steps in the assessment and subsequent surveillance audits takes place and that outcomes are harmonised.

PB3.3 Where a fishery under assessment overlaps with a certified fishery, CABs shall coordinate their assessments so as to make sure that key assessment products and outcomes are harmonised.

PB3.3.3 The team shall explain and justify any difference in the scores in the scoring rationale for relevant PIs."

At the time of writing (February 2017), there are no fisheries overlapping with the Lake Peipus Perch and Pike-perch Fishery. As such, harmonisation is not relevant.

4.2 Previous assessments

This is the first assessment of the Lake Peipus Perch and Pike-perch Fishery. As such, this section is not relevant.

4.3 Assessment methodologies

In conducting this assessment of the LPPF, the FCR v.2.0 (MSC 2014) and the MSC Full Assessment reporting template as per v.2.0 (02/12/15) were used.

The risk-based framework (RBF) was not used in the assessment.

4.4 Site visit

Notifications of each key step in the assessment process were provided to the MSC, uploaded by the MSC to their website, and advertised through the MSC's bi-weekly 'Fisheries Update'. Known stakeholders were also contacted by e-mail and advised of the key steps. The known stakeholders were asked to forward the notifications on to any other person who they considered to be a stakeholder but who was not listed in the group e-mail, or to send the Lead Assessor the other person's details so that they could be contacted.

The site visit was conducted in Tartu, Estonia, with the team being available for meetings with stakeholders from the 17th October to the 21st October, 2016. Notification of the site visit was made through the MSC's Fisheries Update and uploaded to the MSC's website on the 15th September 2016: (https://www.msc.org/track-a-fishery/fisheries-in-the-program/in-assessment/inland/Lake-Peipus-perch-pike-perch/assessment-downloads).

A brief description of the meetings held with stakeholders during the site visit is provided in Table 26, below; the attendees are listed, together with the topics covered during the discussions. More details and notes of the meetings are provided as Appendix 5.

Table 26: Summary of stakeholder meetings held.

Date	Attending	Organisation	Issues Discussed
17 Oct 2016	Rob Blyth-Skyrme	Marine Certification LLC	• MSC process, stakeholder input and the UoAs • Pre-assessment results • Fishing gear and use, seasonality of the fishery • Changes in the fishery over years • Science and management • Licensing and access to licences • Consultation on management with stakeholders
	Dmitry Sendek	Marine Certification LLC	
	Tim Huntington	Marine Certification LLC	
	Olgert Margus	Logi-F	
	Dmitry Lajus	Logi-F	
	Antonio Hervás	ASI	
18 Oct 2016	Rob Blyth-Skyrme	Marine Certification LLC	• MSC process, stakeholder input and the UoAs • Fishing gear and use, seasonality of the fishery • Licensing and access to licences • Consultation on management with stakeholders • Enforcement
	Dmitry Sendek	Marine Certification LLC	
	Tim Huntington	Marine Certification LLC	
	Andrey Ulukhaniyants	Fisherman	
	Dmitry Lajus	Logi-F	
	Antonio Hervás	ASI	
18 Oct 2016	Rob Blyth-Skyrme	Marine Certification LLC	• MSC process, stakeholder input and the UoAs • Role of the MoE • Interaction between the MoE and the ERFC • Consultation processes • Licensing and access to licences • Catch monitoring and IUU fishing • Status of pike-perch and scientific assessment • Management strategy
	Dmitry Sendek	Marine Certification LLC	
	Tim Huntington	Marine Certification LLC	
	Liivika Naks	Estonian Ministry for the Environment	
	Dmitry Lajus	Logi-F	
	Antonio Hervás	ASI	
19 Oct 2016	Rob Blyth-Skyrme	Marine Certification LLC	• MSC process, stakeholder input and the UoAs • Role of the Peipsi CTC in lake management
	Dmitry Sendek	Marine Certification LLC	
	Tim Huntington	Marine Certification LLC	
	Margit Säre	Peipsi Center for Transboundary Cooperation	
	Dmitry Lajus	Logi-F	
	Antonio Hervás	ASI	
19 Oct 2016	Rob Blyth-Skyrme	Marine Certification LLC	• MSC process, stakeholder input and the UoAs • Career focus for Dr. Laanetu • Mammals and potential fishery interactions • Birds and potential fishery interactions • Lake habitats
	Dmitry Sendek	Marine Certification LLC	
	Tim Huntington	Marine Certification LLC	
	Nikolai Laanetu	University of Tartu, retired	
	Dmitry Lajus	Logi-F	
	Antonio Hervás	ASI	
19 Oct 2016	Rob Blyth-Skyrme	Marine Certification LLC	• MSC process, stakeholder input and the UoAs • Fishery management and consultation • Fishermen's Associations • MSC client groups and certificate sharing
	Dmitry Sendek	Marine Certification LLC	
	Tim Huntington	Marine Certification LLC	
	Urmas Pirk	Peipsi Fisheries Local Action Group (FLAG)	
	Ilmar Metsanurk	FLAG Facilitator	
	Dmitry Lajus	Logi-F	

	Antonio Hervás	ASI	
19 Oct 2016	Rob Blyth-Skyrme	Marine Certification LLC	• MSC process, stakeholder input and the UoAs • Fishing gear and use • Catch handling and processing • Fishery management and consultation • Fishermen's Associations • VMS and other fishery monitoring • Fishermen's experience of monitoring and enforcement
	Dmitry Sendek	Marine Certification LLC	
	Tim Huntington	Marine Certification LLC	
	Margus Narusing	Fisherman	
	Uve Seero	Logi-F	
	Krislin Katin	Logi-F	
	Dmitry Lajus	Logi-F	
	Antonio Hervás	ASI	
20 Oct 2016	Rob Blyth-Skyrme	Marine Certification LLC	• MSC process, stakeholder input and the UoAs • VMS and other fishery monitoring • Enforcement and penalties • Stock assessment, including surveys and model • Commercial and survey catch data • Model assumptions on caches and discards • Fishery management, including with Russia • Bird and mammal bycatch • Approach to rebuilding stocks
	Dmitry Sendek	Marine Certification LLC	
	Tim Huntington	Marine Certification LLC	
	Ivo Kask (first part of meeting, only)	Enforcement, Ministry of Environment	
	Vaino Vaino	University of Tartu	
	Dmitry Lajus	Logi-F	
	Antonio Hervás	ASI	
21 Oct 2016	Rob Blyth-Skyrme	Marine Certification LLC	• Fishery performance against the MSC Standard • MSC process
	Dmitry Sendek	Marine Certification LLC	
	Tim Huntington	Marine Certification LLC	
	Dmitry Lajus	Logi-F	
	Antonio Hervás	ASI	

4.5 Evaluation processes and techniques

Several sources of information provided the basis of the conclusions of this assessment, including a review of information and references provided by the client prior to the site visit, information and data sourced during site visit meetings held with stakeholders involved with the fishery (see Table 26), and review of literature and information provided following site visit meetings. Peer review and stakeholder comment on the draft report also provide a very important contribution to the assessment process.

The MSC Principles and Criteria set out the requirements for sustainable fishing. These Principles and Criteria have subsequently been used to develop a standardized, default assessment tree (within the MSC Fisheries Certification Requirements v.2.0, MSC 2014), including Performance Indicators (PIs) and Scoring Issues (SIs), by the MSC and its advisory boards, which have been used in the assessment of this fishery.

Each SI may be scored at up to three scoring guideposts (SGs), which define the level of performance that is required to achieve 100, 80 (the passing score), and 60 scores; 100 represents a theoretically ideal level of performance and 60 a measurable shortfall (requiring a Condition of Certification to be set).

There are two, coupled, scoring requirements that constitute the MSC's minimum threshold for a sustainable fishery:

1. The fishery must obtain a score of 80 or more for each of the MSC's three Principles, based on the weighted average score for all Performance Indicators (PIs) under each Principle.
2. The fishery must obtain a score of 60 or more for every Scoring Issue (SI) within each PI.

A score less than 60 for any individual SI, or less than 80 overall for any Principle would represent a level of performance that causes the fishery to automatically fail the assessment; a score of 80 or above for all three Principles is needed for the fishery to be certified.

Note that where there is only one SI in the PI, the issue can be partially scored – in this case the Assessment Team is able to use their judgement to determine what proportion of the SI was met. For example, at the SG100 level, less than half was met = 85, about half met = 90, and more than half met = 95.

Following the review and synthesis of available information, the assessment team discussed each individual SI to assess the evidence is present to assess the level of performance that the fishery achieved. Justification of the scoring is provided in the scoring tables presented in Appendix 1. Individual team members were responsible for drafting the different sections, but the scoring was agreed by all team members.

Scoring for the two UoAs of the Lake Peipus Perch and Pike-perch Fishery – UoA 1) perch, and UoA 2) pike-perch – was divided by UoA for Principle 1. The overall score for each PI for each species was therefore calculated on the basis of the SI scores, as depicted in Table 27:

Table 27: Performance indicator scoring protocol

How many SIs met?	SG60	SG80	SG100
All	60	80	100
Half	FAIL	70	90
Less than half	FAIL	65	85
More than half	FAIL	75	95

Scoring the Principle 2 PIs was undertaken on the basis of combining the two UoAs. Where necessary, the different primary, secondary and ETP species impacted by the fishery were assessed as individual elements, with scores again calculated following the FCR 7.10.7 protocol (MSC 2014). A table showing an example of the scoring calculation for a Principle 2 PI is again provided (Table 28).

Table 28: Example scoring calculation for a P2 PI with elements.

UoA	Element	Main / minor	SIa (60, 80, 100)	SIb (100 only)	Element Score	PI Score
1 or 2	1	Main	80	-	80	85
	2	minor	-	Doesn't meet 100, so default 80	80	
	3	minor	-	Doesn't meet 100, so default 80	80	
	4	minor	-	100	100	

Scoring for Principle 3 was undertaken on the basis of both UoAs being scored the same, and with no elements scored independently.

4.5.1 Principle 1 and Principle 2 scoring elements

The elements that were scored for each PI under Principles 1 and 2 are listed in Table 29. Scores allocated for each PI were entered into the MSC Fishery Assessment Scoring Worksheet in order to attain the overall Principle scores; the final scores for each PI are shown in Section 6 of this report.

Table 29: Scoring elements for Principle 1 and Principle 2 for each UoA**.**

UoA	Component	Scoring elements		Main / minor	Data-deficient?
1	P1 – Target	Perch	*Perca fluviatilis*	N/A	No
2	P1 – Target	Pike-perch	*Sander luciperca*	N/A	No
1 & 2	P2 – Primary	Perch*	*Perca fluviatilis*	Main	No
		Pike-perch*	*Sander luciperca*	Main	No
		Bream	*Abramis brama*	Main	No
		Roach	*Rutilus rutilus*	Main	No
		Pike	*Esox lucius*	Main	No
		Burbot	*Lota lota*	Minor	No
		Vendace	*Coregonus albula*	Minor	No
		Ruffe	*Gymnocephalus cernua*	Minor	No
		Peipsi whitefish	*Coregonus maraenoides*	Minor	No
	P2 – Secondary	Crucian carp	*Carassius carassius*	Minor	No
	P2 – ETP	Asp	*Aspius aspius*	N/A	No
		Wels	*Siluris glanis*	N/A	No
	P2 – Habitats	Sandy muds and mud		Main	No
		Cobbles and rocks		Minor	No
	P2 – Ecosystem	Lake water chemistry		N/A	No
		Lake fish community structure and function		N/A	No

*SA 3.1.3.1 (MSC 2014) requires that pike-perch is considered as a P2 species in scoring UoA 1 (Perch), and that perch is considered as a P2 species in scoring UoA 2 (Pike-perch); in both cases, these were assessed as main primary species.

5 Traceability

5.1 Eligibility date

The target eligibility date for the Lake Peipus Perch and Pike-perch Fishery is the date of publication of the Public Comment Draft Report. This is permitted under CRv2.0 (CR7.6, MSC 2014).

Any fish any fish harvested after the eligibility date and sold or stored as under-assessment fish shall be handled in conformity with relevant under-assessment product requirements in the MSC Chain of Custody standard (CR7.6.2, MSC 2014).

5.2 Traceability within the fishery

The Lake Peipus perch and Pike-perch Fishery is subject to a high level of monitoring relative to its scale and intensity. In particular, all vessels are required to operate a VMS, and, as noted in Section 3.7.9.1, the overall inspection rate of all fishing trips (on lake and at landing) is around 11%.

A description of the traceability risk factors and any mitigation measures within the Lake Peipus Perch and Pike-perch Fishery are provided in Table 30, below.

Table 30: Traceability factors within the fishery:

Traceability Factor	Description of risk factor if present. Where applicable, a description of relevant mitigation measures or traceability systems (this can include the role of existing regulatory or fishery management controls)
Potential for non-certified gear/s to be used within the fishery.	Long-lines and Danish seines are used within Lake Peipus to take both perch and pike-perch, but these gears are not part of this assessment. However, long-lines are a very minor gear that is used rarely, and Danish seining is undertaken for a relatively short and closely monitored season. The Estonian Danish seine season is controlled through vessel days, and so vessels using this gear are dedicated to the gear during this season. Eligible gears are recorded on vessel licenses, and location of landing together with the catch quantities by species must be reported prior to any vessel arriving in port. Logbooks must record the gear used and the catch quantities by species. Overall, there is some potential for non-certified gears to be used within the fishery, but this risk is mitigated through appropriate monitoring.
Potential for vessels from the UoC to fish outside the UoC or in different geographical areas (on the same trips or different trips).	Lake Peipus forms an intensively-monitored border between Russia and Estonia. There is no possibility that Estonian vessels would be able to fish in Russian waters, or vice versa. Vessels would therefore not be able to fish outside the UoC unless they are physically removed from the lake they would not be able to fish outside of the UoC.
Potential for vessels outside of the UoC or client group fishing the same stock.	As noted above, Lake Peipus forms an intensively-monitored border between Russia and Estonia. Russian vessels do fish the same stocks as Estonian vessels (i.e., Lake Peipus perch and pike-perch), but there is no possibility that Russian vessels would be able to fish in Estonian waters, or vice versa.

	Long-lines and Danish seines are used within Lake Peipus by Estonian fishermen to take both perch and pike-perch, and these gears are not part of this assessment. As noted above, there is appropriate monitoring in place that mitigates the risk that fish caught with these gears would be passed off as being from the UoC.
Risks of mixing between certified and non-certified catch during storage, transport, or handling activities (including transport at sea and on land, points of landing, and sales at auction).	Vessels fish on day trips only, and landings are carried out on a daily basis upon returning to port. Fishing companies holding the fishing licences collect the fish from port and Logi-F takes ownership from the storage facilities of the fishing companies. The point at which the fishery traceability ends and Chain of Custody (CoC) starts is the point of first landing, and so CoC must be conducted from that point forward to address any risks of catches being mixed after landing.
Risks of mixing between certified and non-certified catch during processing activities (at-sea and/or before subsequent Chain of Custody).	Vessels fish on day trips only, and landings are carried out on a daily basis upon returning to port. There is no processing undertaken at sea, and fish are landed whole. CoC must be conducted from the point of landing forward to address any risks of catches being mixed after landing.
Risks of mixing between certified and non-certified catch during transhipment.	Vessels fish on day trips only, and are not permitted to tranship catches prior to carrying out daily landings. CoC must be conducted from the point of landing forward to address any risks of catches being mixed after landing.
Any other risks of substitution between fish from the UoC (certified catch) and fish from outside this unit (non-certified catch) before subsequent Chain of Custody is required.	None identified.

5.3 Eligibility to enter further chains of custody

It is determined that all perch and pike-perch caught by Estonian commercial fishermen from Estonian waters of Lake Peipus using gillnets or trapnets will eligible to enter in to certified chains of custody (CoC). However, only those perch and pike-perch that are purchased and marketed by Logi-F or other sellers who have signed a certificate-sharing agreement with Logi-F will be eligible to be sold as MSC certified under this certificate, and then carry the MSC ecolabel.

Logi-F buys fish from fishing companies holding fishing licenses, as listed in Section 3.4.1 of the report. These fishing companies collect fish from the fisherman and store the catch in their storage facilities. Change of ownership of the product occurs at the fishing company storage faclities. To ensure there is no risk of mixing, CoC must commence at the point of first landing. Eligible points of landing are confirmed as Estonian ports on Lake Peipus (see Figure 2).

5.4 Eligibility of IPI stocks to enter further chains of custody

There are no inseparable or practically inseperable (IPI) stocks in this fishery.

6 Evaluation Results

6.1 Principle level scores

Table 31: Final Principle scores for each UoA.

	UoA	
Principle	1 (Perch)	2 (Pike-perch)
Principle 1 – Target Species	84.2	84.2
Principle 2 – Ecosystem	85.7	
Principle 3 – Management	81.9	

6.2 Summary of PI scores

Table 32: Final performance indicator scores for each UoA.

				UoA	
Principle	Component	Performance Indicator (PI)		1 (Perch)	2 (Pike-perch)
1	Outcome	1.1.1	Stock status	90	90
		1.1.2	Stock rebuilding	Not scored	Not scored
	Management	1.2.1	Harvest strategy	85	75
		1.2.2	Harvest control rules & tools	75	85
		1.2.3	Information & monitoring	90	90
		1.2.4	Assessment of stock status	75	75
2	Primary species	2.1.1	Outcome	85	
		2.1.2	Management	95	
		2.1.3	Information	100	
	Secondary species	2.2.1	Outcome	90	
		2.2.2	Management	80	
		2.2.3	Information	85	
	ETP species	2.3.1	Outcome	80	
		2.3.2	Management	65	
		2.3.3	Information	60	
	Habitats	2.4.1	Outcome	80	
		2.4.2	Management	80	
		2.4.3	Information	85	
	Ecosystem	2.5.1	Outcome	100	
		2.5.2	Management	100	
		2.5.3	Information	100	
3	Governance and policy	3.1.1	Legal & customary framework	100	
		3.1.2	Consultation, roles & responsibilities	80	
		3.1.3	Long term objectives	60	
	Fishery specific management system	3.2.1	Fishery specific objectives	90	
		3.2.2	Decision making processes	80	
		3.2.3	Compliance & enforcement	85	
		3.2.4	Management performance evaluation	80	

6.3 Summary of conditions

At certification, eight Conditions of Certification are placed on the Lake Peipus Perch and Pike-perch Fishery. These are summarised on Table 33, below, and more detail is provided in Appendix 3.

Table 33: Summary of conditions

#	UoA	PI and SI	Condition
1	**1 (Perch)**	**1.2.2 (b)**	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SIb is met, specifically through demonstrating the following: SIb: "*The HCRs are likely to be robust to the main uncertainties*."
2	**1 (Perch)**	**1.2.4 (c)**	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SIc is met, specifically through demonstrating the following: SId: "*The assessment takes uncertainty into account.*"
3	**2 (Pike-perch)**	**1.2.1 (f)**	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SIf is met, specifically through demonstrating the following: SId: "*There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate*."
4	**2 (Pike-perch)**	**1.2.4 (c)**	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SIc is met, specifically through demonstrating the following: SId: "*The assessment takes uncertainty into account*."
5	**1 & 2**	**2.3.2 (b and c)**	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SIb and SIc are met, specifically through demonstrating the following: SIb: "*There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species.*" SIc: "*There is an objective basis for confidence that the strategy will work, based on information directly about the fishery and/or the species involved*."
6	**1& 2**	**2.3.2 (e)**	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SId is met, specifically through demonstrating the following: SIe: "*There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.*"
7	**1& 2**	**2.3.3 (a and b)**	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SIa and SIb are met, specifically through demonstrating the following: SIa: "*Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species.*" SIb: "*Information is adequate to measure trends and support a strategy to manage impacts on ETP species*."

#	UoA	PI and SI	Condition
8	**1 & 2**	**3.1.3 (a)**	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SIa is met, specifically through demonstrating the following: SIa: "*Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach are explicit within management policy.*"

6.4 Recommendations

None.

6.5 Determination, formal conclusion and agreement

(REQUIRED FOR FR AND PCR)

1. The report shall include a formal statement as to the certification determination recommendation reached by the Assessment Team about whether or not the fishery should be certified.

(Reference: FCR 7.16)

(REQUIRED FOR PCR)

2. The report shall include a formal statement as to the certification action taken by the CAB's official decision-makers in response to the Determination recommendation.

6.6 Changes in the fishery prior to and since pre-assessment

This report comprises the first assessment of the Lake Peipus Perch and Pike-perch Fishery. A pre-assessment was completed against MSC CR v.1.3 in May 2015. The fishery was considered likely to pass full assessment at that time, and no significant changes have occurred in the intervening period.

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Appendix 1: Scoring and Rationales

UoA 1 (Perch) Principle 1 scoring tables

UoA 1: PI 1.1.1 – Stock status

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Stock status relative to recruitment impairment			
	Guidepost	It is **likely** that the stock is above the point where recruitment would be impaired (PRI).	It is **highly likely** that the stock is above the PRI.	There is a **high degree of certainty** that the stock is above the PRI.
	Met?	Y	Y	Y
	Justification	Fish resources of the Lake Peipus system are managed jointly by Estonia and Russia and all commercially important species are TAC regulated. Stocks are assessed annually through a joint scientific fishery programme that samples stocks by trawl and gill nets to assess the year-class strength and that sets quotas based on this. Fishing is terminated when TAC is approached. The harvest strategy does not use explicit biological reference points, such a limit reference point (LRP) to determine stock status. Instead, proxy indicators are used. The TAC is re-calculated each year and the fishery activities are regulated via fishery mortality (F), which is recommended to set like F ≤ M = 30% *Ba* (natural mortality of the middle ages), that is a proxy value consistent with F_{MSY}. A precautionary suite of management measures and tools ensures that fishing effort is low for recent years (actual $F_{0.2\text{-}0.25}$) so the stock remains at productive levels that are appropriate to the scale and intensity of the fishery. The fisheries of the region have been affected by the changing environment and fishing activities. From a system dominated by whitefish and vendace, the fish community structure of the Lake Peipus has shifted to one dominated by perch and pike-perch. The perch stock inhabits the whole Lake Peipus. There is a good food supply for the perch stock in the lake that has a positive impact on survival and abundance. Perch is flexible in its feeding choice. Spawning of perch takes place annually and it is very effective in many sites of the lake resulting in the high abundance of this species. The high reproductive capacity of the perch stock is also increased through the participation of a number of younger spawning fish that are not affected by commercial or recreational fishing. The perch stock of Lake Peipus has been in quite good shape since the 1930s, and the literature has never reported problems with this species, although some changes in catch took place. Stock status was good even in 1990, when after Estonia got independence from Russia, demand of perch increased considerably and this species was overfished in the Baltic Sea coastal areas of Estonia. Meetings of the ERFC in autumn 2015 and 2016 reported that stock status of perch is now on high level due to high recruitment of 2012 and extremely high recruitment of 2015 (ERFC 2015, ERFC 2016). Thus, taking into account good shape of perch stock since the 1930s, the scale and intensity of fishery, and that actual $F_{0.2\text{-}0.25} < F_{MSY}$ for two generations or more there is considered to be a high degree of certainty that the stock is above the point where recruitment would be impaired.		
B	Stock status in relation to achievement of MSY			
	Guidep		The stock is at or fluctuating around a level consistent	There is a **high degree of certainty** that the stock has

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue		SG 60	SG 80	SG 100
	ost		with MSY.	been fluctuating around a level consistent with MSY or has been above this level over recent years.
	Met?		Y	N
	Justification	Fish resources of the Lake Peipus system are managed jointly by Estonia and Russia and all commercially important species are TAC regulated. Stocks are assessed annually through a joint scientific fishery programme that samples stocks by trawl and gill nets to assess the year-class strength and that sets quotas based on this. Fishing is terminated when TAC is approached. In fact, the sense of TAC corresponds to the concept of MSY, although it is difficult to refer to regulatory Estonian or Russian documents. The TAC for perch is F-based and is set as 0.1813 B_N (18.13% of total commercial stock abundance; there is an exponential relationship of the actual coefficient of fishing mortality to catch factor – see details in section 3.5.5. of the report). According to the reliable assessment methodology in used (Tiurin 1967), this is the biologically acceptable withdrawal of fish from Lake Peipus that does not exceed the rate of natural mortality of perch in middle ages (M=0.3) mainly affected by fishery. A precautionary suite of management measures and tools ensures that fishing effort is low for recent years (actual $F_{0.2\text{-}0.25}$ is lower than possible $F_{0.3} = F_{MSY}$) so the stock remains at productive levels. In the recent years there is no evidence of perch overfishing in the lake. On the contrary, a positive increase in the abundance of perch within the Lake Peipus has been observed. According to the recent ERFC materials and opinion of scientists (ERFC 2015, ERFC 2016, interview with V.Vaino), the current status of perch in the lake is very good, but this status is partly due to the present status of pike-perch (stock of which is slightly lower MSY), because these two species of predators are ecologically closely related in Lake Peipus, as supported by evidence of modelling experiments (Bobyrev et al. 2013). Available evidence indicates that the Lake Peipus perch stock is at or fluctuating around a level consistent with MSY. However, uncertainty in the definition of MSY prevents the fishery from reaching the SG100.		
References		Bobyrev et al. 2013, ERFC 2015, ERFC 2016, Tiurin 1967.		

Stock Status relative to Reference Points			
	Type of reference point	**Value of reference point**	**Current stock status relative to reference point**
Reference point used in scoring stock relative to PRI (SIa)	No limit reference point is in place for perch in Lake Peipus.	N/A	N/A
Reference point used in scoring stock relative to MSY (SIb)	F-based	0.1813 x B_N (18.13% of total commercial stock abundance)	$F \leq 0.1813 \times B_N$

OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	**N/A**

UoA 1: PI 1.1.2 – Stock rebuilding

PI 1.1.2		**Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Rebuilding timeframes**			
	Guidepost	A rebuilding timeframe is specified for the stock that is **the shorter of 20 years or 2 times its generation time**. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.		The shortest practicable rebuilding timeframe is specified which does not exceed **one generation time** for the stock.
	Met?	Not relevant		Not relevant
	Justification	The Lake Peipus perch stock does not require rebuilding and so this PI is not relevant to UoA 1 (perch).		
b	Rebuilding evaluation			
	Guidepost	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is evidence that the rebuilding strategies are rebuilding stocks, **or it is likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.	There is **strong** evidence that the rebuilding strategies are rebuilding stocks, **or it is highly likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	The Lake Peipus perch stock does not require rebuilding and so this PI is not relevant to UoA 1 (perch).		
References		N/A		
OVERALL PERFORMANCE INDICATOR SCORE:				**N/A**
CONDITION NUMBER (if relevant):				**N/A**

UoA 1: PI 1.2.1 – Harvest strategy

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Harvest strategy design			
	Guidepost	The harvest strategy is **expected** to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy **work together** towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is **designed** to achieve stock management objectives reflected in PI 1.1.1 SG80.
	Met?	Y	Y	N
	Justification	The harvest strategy for Lake Peipus is based on managing the fishery based on TACs established by Estonian and Russian managers through the Intergovernmental ERFC (established in 1994) for all key commercial species. It is responsive to stock status as it is based on the updated annual estimates of the stock size calculated in the assessment before the season commences. The ERFC meets annually (twice per year 2015 and before), and usually adopts a number of decisions regarding regulation of fisheries. Between these meetings, in-season management in Estonia is performed by Estonian Ministry of Environment. The fishery does not have explicit biological reference points, such as B_{LIM} or B_{MSY}. Instead, a proxy value is used for both TRP and LRP, defined as 30%*Ba* (maximum), where *Ba* is the total commercially available biomass. For perch and pike-perch of Lake Peipus, the estimates of *Ba* is used to calculate 20-25% *Ba*, which is equivalent to the target reference point (TRP) as is used with the same intent as B_{MSY}. The TRP (which is also equivalent to the limit reference point (LRP)) based on 20-25% *Ba* is used to establish annual fishing opportunities for perch and pike-perch (in other words determined fishing mortality, which actually considered as $F_{0.2\text{-}0.25} \leq M$, is used with the same intent as F_{MSY}) and this precautionary approach has been demonstrated to effectively keep the stock well above the point at which recruitment would be impaired. The harvest strategy also includes distribution of quota among two countries (Estonia and Russia get equal quota for Lakes Peipsi and Lämmijärv, and Russia also gets quota for Lake Pihkva), determining fishing rules separately in Estonia and in Russia which take into account limitation of number and capacity of fishing boats, fishing effects in term of type of fishing gear, seasons of fishing, location of gear. Estonian management system uses so-called Olympic system when quota is not given to each user, and fishing is terminated when quota is approached (roughly 90%). In Estonia, annual quota is subdivided into two parts – for the first and second half a year, and thus fishing may be terminated twice a year. Fishers need to make daily reports and to complete logbooks. Estonian fisheries usually use almost the entire quota. In Russia, the TAC is subdivided to quota for each user, and each user terminates fishing when quota is approached. Because not all users fully use their quota, part of Russian quota is not taken. This approach makes it difficult for the national quotas in Estonian and Russian parts of the lake to be exceeded. The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80. The fishery therefore meets SG80. However, there is no evidence to demonstrate the harvest strategy has been 'designed' to meet SG100.		
b	Harvest strategy evaluation			
	Guidep	The harvest strategy is **likely**	The harvest strategy may	The performance of the

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
	ost	to work based on prior experience or plausible argument.	not have been fully **tested** but evidence exists that it is achieving its objectives.	harvest strategy has been **fully evaluated** and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	Y	Y	N
	Justification	Perch and pike-perch are the most important species within the Lake Peipus fisheries, forming more than 60% of total catch. According to scientific data, the perch stock in Lake Peipus is in good condition due to high recruitment of the last several years. In terms of catches, perch has been the number one target species in Estonia (average annual catch of 886 t in the years 2008-2015) and throughout the lake (average catch of 1,613 t in the years 2008-2012) (Eschbaum et al. 2013, Eschbaum et al. 2014, http://www.agri.ee). From the accepted normal method of calculation of TAC there is no evidence of overfishing of the perch population. On the contrary, in recent years some increase of perch biomass in the Lake Peipus has been observed. For 2016, the TAC value established by ERFC for both countries was 2,100 t, and for 2017 it was 2,450 t (ERFC 2016). Therefore, it can be concluded that there is evidence from more than two decades of existence that the harvest strategy is achieving its objectives, and SG80 is met. The fishery does not meet SG100 as there is no evidence that the harvest strategy has been fully tested.		
c	Harvest strategy monitoring			
	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	One of the main objectives of the ERFC is to develop joint research program between Estonia and Russia on Lake Peipus. In accordance with this programme, joint monitoring studies (using trawls, trap-nets, gill nets) are conducted in the territorial waters of Estonia and Russia every year, in which specialists from both countries participate. The results of the monitoring surveys form the basis for the determination of fish stock status (and the setting of TACs) in Lake Peipus, and also serve as ongoing indicators of the implementation of the commercial fishing strategy. The Ministry of Agriculture of Estonia is responsible for monitoring and controlling fishing effort and to collate and maintain records detailed catch information by species from the commercial fishery. To facilitate the implementation of fishing monitoring, since 2015, each commercial vessel is equipped with a positioning device - VMS. Information is also collected from the recreational fishery and estimates of under-reporting defined to enable the total catch to be raised. Thus, monitoring is in place to determine whether the harvest strategy is working, and this SG60 requirement is met.		
d	Harvest strategy review			
	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			N
	Justification	Periodically reviewed elements of the harvest strategy include the TAC values and optimal fishing gears and efforts; these are determined by ERFC in association with the annually established stock status of various species and their dynamic in the changing ecosystem of Lake Peipus. In the context of the reviewed fishing strategy it should be highlighted also		

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
		that a more detailed program of scientific monitoring is undertaken in comparison to previous years, improved reporting of commercial catch (previously - once a month, once every fifteen days, once every five days, now - every day), and improved supervision for the commercial catches caught and landed and fishing efforts used (for example, by binding of the VMS in Estonia since 2015, in Russia - VMS at the administration stage). The new version of the rules of fishing in Estonia entered into force on January 2017. The ERFC meetings provide a good forum for regular reviews of the strategy. Switching the annual meeting of the ERFC from earlier practiced meetings twice a year (before 2015) - this is also a form of periodical reviewed element of the fisheries management strategy. Measures and tools are typically reviewed regularly to manage the overall fishery, but it is not clear that all elements of the specific harvest strategy of the fishery are reviewed and improved, if necessary, and in particular the monitoring and control of recreational fishery of perch which can constitute a significant part of harvest of the species, especially in the winter period. Therefore, the fishery does not meet this SG100 requirement.		
e	Shark finning			
	Guidepost	It is **likely** that shark finning is not taking place.	It is **highly likely** that shark finning is not taking place.	There is a **high degree of certainty** that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	The Lake Peipus fishery occurs in freshwater and sharks are not a target species. This SI is not scored.		
f	**Review of alternative measures**			
	Guidepost	There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
	Met?	Y	Y	Y
	Justification	The perch stock in Lake Peipus has been in quite good shape since 1930s, and no problems have been reported historically in the literature with this species, although some fluctuations in catches have taken place. Stock status was good even in 1990 when, after Estonia got independence, demand for perch increased considerably and they were overfished in Baltic Sea coastal areas of Estonia. In terms of catches, perch of Lake Peipus has been the number one target species both in Estonia (average annual catch of 886 t) and throughout the lake (average catch of 1,556 t in the years 2008–2015) (Eschbaum et al. 2013, Eschbaum et al. 2014, http://www.agri.ee). The biggest quantities of perch in the lake are caught with trapnets, lines of trapnets and Danish seines. In some years, the Danish seine fishery in autumn uses 55 mm knot to knot mesh in the codend to minimise catches (and discarding) of perch if the quota for the perch fishery is close to being exhausted. Measures that are considered for minimizing unwanted mortality, and then implemented, include that directed fishing for target species is curtailed when approximately 90% of the quota is taken, leaving the rest for catches in other parts of the fishery. Gillnet and trapnet mesh sizes are also set to minimise the potential for capture of undersized fish. Potentially, all of the fishing gears in use can catch perch juveniles. There is evidence that efforts are made to minimise discarding through introducing closed areas and closed seasons, and through mesh size regulations, and that such measures are considered		

PI 1.2.1		There is a robust and precautionary harvest strategy in place	
		annually and sometimes even within the fishing year. The fishery meets SG100.	
References		ERFC 2016, Eschbaum et al. 2013, Eschbaum et al. 2014, http://www.agri.ee	
OVERALL PERFORMANCE INDICATOR SCORE:			**85**
CONDITION NUMBER (if relevant):			**N/A**

UoA 1: PI 1.2.2 – Harvest control rules and tools

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue		SG 60	SG 80	SG 100
a	HCRs design and application			
	Guidepost	**Generally understood** HCRs are in place **or available** that are **expected** to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	**Well defined** HCRs are **in place** that **ensure** that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock **fluctuating around** a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock **fluctuating at or above** a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, **most** of the time.
	Met?	Y	Y	Y
	Justification	Harvest control rules are based on achieving the allocated quota. Quota is set up annually based on stock assessment. TAC and quota are allocated in the beginning of the fishing season and is not corrected based on in-season surveys. Catches are monitored continually and updated daily in Estonia and twice each month on the 15th and 30th in Russia to provide summaries of the current and cumulative catch totals by species. Once the quota for any TAC species is approached (around 90%) the fishery is closed, allowing room for the remainder to be made up of bycatch in fisheries directed at other species. Monitoring of fish populations in Lake Peipus is performed jointly by Estonian and Russian researchers in a framework of co-ordinated research program. In the process of scientific monitoring, the ecological role of the target stocks at different stages of the life cycle is analysed. There are four fishery-independent trawl surveys within the joint programme of monitoring works; size structure, age structure, sex structure, total population size related to commercial size, as well as ecological characteristics of perch, are the issues of two trawl surveys - in spring and mid-October. Typical of most post Soviet Union inland fisheries, fishing opportunities are calculated on an annual basis to take into account inter-annual variability in estimated stock size (i.e. annual changes in *Ba*) and ensures that the exploitation is reduced as stock size declines. As such, annual changes in fishing opportunities are not triggered by a single limit reference point, but rather a proportion of *Ba* such that the exploitation decreases as a function of stock size. It has been noted that as the annual TAC is calculated on the commercially available biomass (*Ba*), not total stock biomass (*Btotal)*. The precautionary harvest strategy will thus always protect a proportion of the juvenile and more productive fish within the population (i.e. larger mature fish), allowing the stock to rebuild, if needed. Furthermore, given that the annual calculation of the perch and pike-perch TAC values is based on the 20-25% of *Ba* (which is lower than recommended 30% of *Ba* - according to the methodology used to determine the TAC), the level of uncertainty is expected to increase with sampling lower levels of biomass within the lake and therefore act to decrease the annual quota at a faster rate at lower stock sizes. However, in practice, a greater reduction of fishing opportunities at lower stock sizes is highly likely to reduce fleet capacity through poor economic performance before a severe reduction of the stock occurs. Fishing opportunities are reviewed on an annual basis by the expert review panel within the ERFC and a declining abundance and catch series would be expected to trigger early management action such as a fishing ban by certain gear types (in specified seasons) or		

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
		total ban on the fishery before biomass is significantly reduced. In addition, the harvest control rules and tools are supported by a suite of precautionary management measures and tools as part of the harvest strategy that help prevent the stock status reaching a point of recruitment impairment (PRI). These include both spatial and temporal closures to provide a refuge for proportion of the stock at any one time (all age classes), a defined mesh size range that selects size/age of fish and control over the total number of annual fishing licenses. These relatively simple harvest control rules and tools are appropriate for the scale and intensity of the fishery, keep the stock fluctuating at or above a target level consistent with MSY taking into account the ecological role of the stock most of the time and are deemed sufficient to meet SG100 level.		
b	HCRs robustness to uncertainty			
	Guidepost		The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a **wide** range of uncertainties including the ecological role of the stock, and there is **evidence** that the HCRs are robust to the main uncertainties.
	Met?		N	N
	Justification	The management system accounts for some uncertainty when setting HCRs. For example, managers estimate the magnitude of mortality from recreational and IUU fishing, and include the estimates in the stock assessment and in the process of allocating the TAC and quotas. Russian fishers do not usually take their entire quota because of limited capacity of individual users, and so the entire TAC for the lake is usually underused, but while this provides some robustness for uncertainty, this is not a part of the harvest control mechanism. However there remain some uncertainties about how managers estimate actual values for recreational and IUU fishing, and for the level of mortality associated with discarding, particularly of juvenile perch. Perch is the subject of quite an intensive recreational fishery, and in some years the volume of the recreational fishery can be about half of the commercial fishery, especially if the ice conditions in winter are favourable for amateur fishing (Orru et al. 2014). Thus, it is not clear that the HCRs are likely to be robust to the main uncertainties (levels of mortality associated with non-commercial fisheries and discarding), and the fishery is not considered to be meeting SG80. A Condition of Certification (#1) is therefore set.		
c	**HCRs evaluation**			
	Guidepost	There is **some evidence** that tools used **or available** to implement HCRs are appropriate and effective in controlling exploitation.	**Available evidence indicates** that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.	**Evidence clearly shows** that the tools in use are effective in achieving the exploitation levels required under the HCRs.
	Met?	Y	Y	N
	Justification	The management system (the tools in use) has been tested in its current state for more than two decades and has proved its effectiveness since stock levels of perch and pike-perch are above the point of recruitment impairment (PRI) and have been fluctuating around a level consistent with MSY over recent years. However, there is not clear evidence that the good stock levels have resulted from the effectiveness of the HCRs only, or result from other factors as well, such as beneficial shift		

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place	
		in climate change for perch and pike-perch or migration of stocks from unexploited (Estonian or Russian) areas of Lake Peipus in different seasons. Here the team assumes a precautionary approach and assigns a score of 80, but not 100.	
References		Orru et al. 2014,	
OVERALL PERFORMANCE INDICATOR SCORE:			**75**
CONDITION NUMBER (if relevant):			**1**

UoA 1: PI 1.2.3 – Information and monitoring

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Range of information			
	Guidepost	**Some** relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	**Sufficient** relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A **comprehensive range** of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	Y	Y	Y
	Justification	There is sufficient relevant information to support the harvest strategy. Studies of the fishery and its effect on the ecosystem of Lake Peipus have been performed for many years. Lake Peipus was the first water body in Russia where limits on the fishery were introduced, in 1859, and the document was called ‘‘Rules on restrictions of fishing in Lake Peipsi’’. These regulations banned fishing for juveniles and usage of net gear with fine mesh size. The Ministry of Agriculture of Estonia is responsible for organizing commercial fishing and keeping records of commercial fishing on the Estonian side, including managing a fishing vessel register and collecting data on commercial fishing. According to the annual "Programme of joint research of Russia and Estonia at the lakes Peipsi, Teploye and Pskov lakes", which is annexed to the Protocol ERFC, monitoring is carried out during all seasons of the year with the use of different fishing gear (trawl, Danish seine, traps, large-mesh size nets, small mesh size nets). In the course of monitoring research, carried out by both sides independently but using similar methods, a comprehensive range of information is collected and available for managers for analysis; these include the distribution, density, size-age structure of the main commercial fish species, biological characteristics of populations of key fish species (sex, fertility, maturity, food supply), the catch of different fishing gear, values of catches on fishing effort, the nature and intensity of the fishery, and quality of environment. The Ministry of Environment of Estonia is also responsible for organizing recreational fishing and investigating the structure of the catch of recreational fishermen. As a result, the Assessment Team has determined that there is a comprehensive range of information available to support the harvest strategy, including other environmental information in addition to other hydrographic information to help better understand the context of the fishery. Given the scale and intensity of the fishery, this level of information and monitoring meets the requirements at SG60, SG80 and SG100 levels.		
b	Monitoring			
	Guidepost	Stock abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control	Stock abundance and UoA removals are **regularly monitored at a level of accuracy and coverage consistent with the harvest control rule**, and one or more indicators are	**All information** required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent **uncertainties** in

PI 1.2.3		Relevant information is collected to support the harvest strategy		
		rule.	available and monitored with sufficient frequency to support the harvest control rule.	the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	Y	Y	N
	Justification	The harvest control rule is managed on an annual frequency which is appropriate for the management of the stock. Whilst carrying out an commercial fishing on Lake Peipus, the Estonian fishery companies meet the requirements of chapter IV "Accounting for fishing" (paragraph 61) relating to the Fishing Act of Estonia (https://www.riigiteataja.ee/en/eli/503082015006/consolide#para9), namely to: *(1) A person who fishes or collects aquatic plants on the basis of a commercial fishing authorisation shall submit catch, collection, transhipment or landing information or other information relating to these works.* *(8) The master or a representative of the master of a fishing vessel with an overall length of 12 meters or more which catches fish at sea shall submit the information relating to fishing by electronic means to the Ministry of Agriculture pursuant to the procedure established in Council Regulation (EC) No 1224/2009 and Commission Implementing Regulation (EC) No 404/2011.* *(13) The master of a fishing vessel which catches fish or receives, transports or processes fish at sea shall notify the Environmental Inspectorate of the ship's entry into a port and of the quantity of fish on board.* The record keeping of the information specified in subsections (1) and (8) of this section is arranged by the Ministry of the Agriculture. According to regulations of the Ministry of the Agriculture onboard each fishing vessel is a fishing logbook, registered with the Estonian Environmental Inspectorate (EEI), which specifies the organisation conducting the fishery, the person responsible for fishing (the master, lead men), license number for permission to catch fish, location of fishing activity, details of fishing gear (e.g. mesh size), physical location (coordinates) of unloading of catch of fish, type and number of acceptance documents. The logbook also specifies the person responsible for keeping fishing records in the logbook and the name of each company or team connected with the catch of fish (with the indication of time of each operation). The logbook also records the catch weight of each fish by species (kg) including those retained on board or released. A cumulative catch of fish by species is also maintained. The level of completeness and correctness of maintaining the fishing logbook and filling out of required documentation is regularly checked by the organizations controlling fishing. Updated catches by gear type are available online from the Ministry for the Environment. In addition to commercial catches, an annual stock assessment is completed before the start of the fishing season by Estonian (Department of Marine Fisheries, University of Tartu) and Russian (Pskov branch of State Research Institute on Lake and River Fisheries) scientists independently to monitor commercial stock abundance (B_N) and available stock biomass (*Ba*) to the fishery. The researchers use different gear types (trawl, Danish seine, traps, large-mesh size nets, small mesh size nets gillnets) with a gear selectivity similar to that of the commercial fishery to estimate stock biomass. Whilst carrying out scientific monitoring during a whole year, a comprehensive range of biological and ecological information is collected in order to confirm the status of stocks of the main commercial fish species. Given the scale and intensity of the fishery, there is sufficient evidence to monitor stock		

PI 1.2.3		Relevant information is collected to support the harvest strategy		
		abundance and UoA removals at a level of accuracy and coverage consistent with the harvest control rules, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rules. This is sufficient to meet both SG60 and SG80 levels. There is no evidence to demonstrate that there is a good understanding of inherent uncertainties in the information and the robustness of assessment and management to this uncertainty to meet the SG100 level.		
c	Comprehensiveness of information			
	Guidepost		There is good information on all other fishery removals from the stock.	
	Met?		Y	
	Justification	In recent years a considerable reduction of the level of illegal catch on Lake Peipus has been noted, in particular in comparison with early post-Soviet period. This is in part due to improvement of activity of the fishing organisations in holding fishery conservation events (i.e., to remove unmarked and lost nets from the water), the optimisation of fishing activities, and because professional fishermen provide constant monitoring and surveillance over the reservoir, including self-policing effect of licensed fishers. Illegal activities especially have reduced since the introduction of VMS in Estonia in 2015. Estimation of the level of recreational fishing is based on questionnaires completed by recreational fishers and organised by the Ministry of the Environment every 3-4 years. In between years, catches are estimated based on ice conditions (availability) and fish size (desirability). In the event that estimates of recreational catch or other mortalities were not accurate, this should be identified quickly through the annual stock assessment process. It is considered that there is good information about all fishery removals from the stock and so SG80 is met.		
References		ERFC 2015, ERFC 2016		
OVERALL PERFORMANCE INDICATOR SCORE:				**90**
CONDITION NUMBER (if relevant):				**N/A**

UoA 1: PI 1.2.4 – Assessment of stock status

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Appropriateness of assessment to stock under consideration			
	Guidepost		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?		Y	N
	Justification	The assessment method is used to estimate biological reference points to manage the fishery under an annual quota system. The stock assessment is based on results of annual trawl surveys implemented by Estonian and Russian sides independently. Scientists of both countries estimate stock status based on available data about the amount and size-age composition of catches (see details in Section 3.5.5, above). Questionnaires of recreational fishers in some years (four surveys in the last 15 years – V.Vaino, pers. comm.) and estimates in other years based on ice conditions (i.e., related to accessibility) and average fish size (i.e., related to desirability). The assessment of the stock is appropriate both for the stock and for the implemented harvest control rules. This is sufficient to meet the requirements at SG80.		
b	Assessment approach			
	Guidepost	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	
	Met?	Y	Y	
	Justification	Stock assessments for all commercial fishes including perch and pike-perch are carried out by the scientists of Estonia and Russia ERFC to estimate the commercially available biomass (*Ba*) on an annual basis. TACs are determined based on a principle of optimal removals suggested by Tjurin (1967), according to which the appropriate level of commercial fish mortality should not exceed the natural mortality coefficient. Considering that usually the coefficient of natural mortality for fish targeted by commercial fishing is approximately 30%, the TAC in consequence is set at approximately the same value. This principle of stock management according to Tjurin (1967) has been used for a number of years in freshwater fisheries in the former Soviet Union, and has shown to be very effective in maintaining populations For perch and pike-perch of the Peipus Lake the estimates of *Ba* is used to calculate 20-25% *Ba*, which is equivalent to the target reference point (TRP) as is used with the same intent as F_{MSY}. The TRP (which is also equivalent to the limit reference point (LRP) based on 20-25% *Ba* is used to establish annual fishing opportunities for perch and pike-perch (in other words determined fishing mortality, which actually considered as $F_{0.2\text{-}0.25} \leq M$, is used with the same intent as F_{MSY}) and this precautionary approach has been demonstrated to effectively keep the stock well above the point at which recruitment would be impaired. This approach is considered appropriate for the scale and intensity of the fishery and as a result the team assigns a score of 80 to this SI.		
c	Uncertainty in the assessment			
	Guidepost	The assessment **identifies major sources** of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points

PI 1.2.4		There is an adequate assessment of the stock status		
				in a **probabilistic** way.
	Met?	Y	N	N
	Justification	The assessment identifies major sources of uncertainty. Estimation of the level of recreational fishing is based on questionnaires received from recreational fishers (responsibility of Ministry of Environment). Volumes of fish caught by recreational fishers are based on the number of fishermen on the Peipus Lake during winter and summer periods, the intensity of fishing, intensity of fishing of particular species of fish (targeting behaviour), and average time spent fishing during the winter and summer periods. The collected data are recorded in a so called "amateur fisher card". The level of IUU catch and discard mortality is accounted for by applying a correction factor to the fishing mortality estimate. The ultimate values of non-commercial and IUU removals and discard mortality are determined by expert review of fishery scientists of both countries at joint ERFC, but the Assessment Team has not seen a clear explanation of the methodology employed. Essentially, it is clear that the assessment identifies major sources of uncertainty, but it is not apparent how this uncertainty is taken in to account. As such, the fishery meets the requirements at SG60 but not SG80, and a Condition of Certification is set (#2).		
d	Evaluation of assessment			
	Guidepost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			N
	Justification	There is no evidence to indicate the assessment method have been tested and explored and that alternative hypotheses have been rigorously explored to meet the requirements at the SG100 level.		
e	Peer review of assessment			
	Guidepost		The assessment of stock status is subject to peer review.	The assessment has been **internally and externally** peer reviewed.
	Met?		Y	Y
	Justification	Each year at the end of October, Estonian and Russian ichthyologists independently undertake stock assessments of different fish species in Lake Peipus, and develop recommendations for TACs and fishing regimes for the next year. After that, each country holds one or more meetings of their fishery councils with representatives from the plurality of stakeholders (in Estonia - Ministry of Agriculture, Ministry of Environment, State University, Marine Institute, Fishery Associations, NGOs, fishery oversight authority, fishermen and other interested parties), where all these issues are discussed. At the same time Estonian and Russian scientists hold bilateral consultations, during which they produce estimates of stock status of commercial fish species, recommendations for TAC values, fishery bases and fishery regimes for the next year. Before entering these materials in the ERFC commission, Russian assessments and recommendations have to be approved by State Ecological Expertise which is independent of the fishery management system. At the end of November, at the ERFC meeting, each party's assessments are reviewed by the other party, before the heads of Estonian and Russian delegations sign the final protocol, which set values of TACs for different fishes and fishing regimes for both countries. By the end of year, the Protocols of the ERFC are approved by the Ministry of Environment in Estonia, and by the Federal Agency for Fisheries in Russia. After the Protocols are signed, they have the force of law in both countries.		

PI 1.2.4		There is an adequate assessment of the stock status	
		Thus, since the multi-stage approval process of stock status, TACs and fishing regimes implies mutual checks at the level of the two countries, the assessment is considered to be internally and externally peer reviewed, so meeting the SG100 level of performance.	
References		Tjurin, 1967; Ricker, 1979; Rudenko, 1985; Sechin, 1990; Shibayev, 2014.	
OVERALL PERFORMANCE INDICATOR SCORE:			**75**
CONDITION NUMBER (if relevant):			**2**

UoA 2 (Pike-perch) Principle 1 scoring tables

UoA 2: PI 1.1.1 – Stock status

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Stock status relative to recruitment impairment			
	Guidepost	It is **likely** that the stock is above the point where recruitment would be impaired (PRI).	It is **highly likely** that the stock is above the PRI.	There is a **high degree of certainty** that the stock is above the PRI.
	Met?	Y	Y	Y
	Justification	The status of the Lake Peipus perch and pike-perch stocks are assessed on an annual basis jointly by Estonian and Russian scientists. The stock status assessments are based on a data of monitoring researches of fish community on a broad variety of biological characters and accounting for ecological position of each species in a dynamic ecosystem of Lake Peipus. Quotas for perch and pike-perch are set on the basis of assessments of actual stocks values. The harvest strategy does not use explicit biological reference points, such a limit reference point (LRP) to determine stock status. Instead, proxy indicators are used. TAC is a proxy value consistent with F_{MSY} which is re-calculated each year and the fishery activities are regulated via fishery mortality (F), which is recommended to set like F ≤ M = 30% *Ba* (natural mortality of the middle ages), that is a proxy value consistent with F_{MSY}. A precautionary suite of management measures and tools ensures that fishing effort is low for recent years (actual $F_{0.2\text{-}0.25}$) so the stock remains at productive levels that are appropriate to the scale and intensity of the fishery. The fisheries of the region have been affected by the changing environment and fishing activities. From a system dominated by whitefish and vendace, the fish community structure of the Lake Peipus has shifted to one dominated by perch and pike-perch. The pike-perch stock inhabits the whole Lake Peipus. Spawning of pike-perch takes place annually and it is very effective in many sites of the lake. Pike-perch spawning depends on water temperature much more than on the spawning stock biomass and larval survival can be very different. The high fecundity of pike-perch results in the high abundance of juveniles of this species in favourable years. Smelt and vendace dominated the food of pike-perch in the 1960s-70s, but since the 1990-2000s the stocks of smelt and vendace have reduced in Lake Peipus. Because of this, pike-perch in Lake Peipus switched to feeding on roach, perch, ruffe and, especially in good years for pike-perch reproduction, young pike-perch. The pike-perch population has experienced declines in the past (1950s-1970s) which were, at least partly, caused by fishing pressure. After a significant reduction in fishing effort due to limitation of use of Danish seines after 1974, a number of strong generation of pike-perch appeared. As a result, pike-perch considerably increased their abundance during recent decades by a factor of 10–15 (from 300 to 3500 t and more). This was facilitated also by eutrophication of the lake, which is known to be favourable for this species, and also by the influence of the perch fishery, because perch is the main food competitor of pike-perch in the lake (Bobyrev et al. 2013). Eschbaum et al. (2013) concluded that there was some evidence of decline of the pike-perch stock in years 2011-2012. However, according to the latest materials of the ERFC, the pike-perch stock in Lake Peipus has remained in a satisfactory condition in recent years, and it slightly increased during the last year. The pike-perch population in 2016 was dominated by fish of abundant generations of 2012 and 2015. Fish of these productive cohorts will form the basis of pike-perch stock and catches in 2017. Scientists also reported		

<table>
<tr><td colspan="2">PI 1.1.1</td><td colspan="3">The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing</td></tr>
<tr><td></td><td></td><td colspan="3">that another productive generation of pike-perch appeared in Lake Peipus in 2016 (ERFC 2015, ERFC 2016). The growth of biomass of pike-perch in Lake Peipus in recent years facilitated a gradual increase of Estonian national fishing quotas: 2013-2015 (650 t), 2016 (725 t), 2017 (830 t). Taking into account that Estonian companies usually take close to the entire annual quota for pike-perch (65-98% for 2013-2015) and individual quotas of Russian companies very often is taken only partly because not all companies are able to take their quota due to capacity limitations, we can conclude that actual $F_{0.2\text{-}0.25} < F_{MSY}$ for two generations or more. Thus, there is a high degree of certainty that the stock is above the PRI, and the UoA meets SG100.</td></tr>
<tr><td>b</td><td colspan="4">Stock status in relation to achievement of MSY</td></tr>
<tr><td></td><td>Guidepost</td><td></td><td>The stock is at or fluctuating around a level consistent with MSY.</td><td>There is a high degree of certainty that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.</td></tr>
<tr><td></td><td>Met?</td><td></td><td>Y</td><td>N</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">Fish resources of the Lake Peipus system are managed jointly by Estonia and Russia and all commercially important species are TAC regulated. The TAC for pike-perch is F-based and is set as 18.13% of the abundance of age 3+ fish (there is an exponential relationship of the actual coefficient of fishing mortality to catch factor – see details in section 3.5.5. of the report), and 10% of the abundance of age 2 fish. A precautionary suite of management measures and tools ensures that fishing effort is low for recent years (actual $F_{0.2\text{-}0.25}$ is lower than possible $F_{0.3} = F_{MSY}$) so the stock remains at productive levels. Stocks are assessed annually through a joint scientific fishery programme that samples stocks by trawl and gill nets to assess the year-class strength and that sets quotas based on this. Fishing is terminated when TAC is approached. In fact, the sense of TAC corresponds to the concept of MSY, although it is difficult to refer to regulatory Estonian or Russian documents.

The specifics of pike-perch fishing in Lake Peipus is that the population is dominated by individuals of the first years of life, while fish of older ages are less common. In view of the growth rate of Lake Peipsi pike-perch stock and its potential natural mortality, fishing for pike-perch should not be started until the fish are three or four years old. Theoretically, pike-perch catches from the lake would be larger and more lucrative in this case. In practice, however, this model would hardly be workable.

With the current approximately 10,000 tonnes of biomass of predatory fish, the lake (dwarf) smelt stock of the lake has decreased drastically and has not been able to recover, which means that the fry of the main predatory fish – pike-perch and perch – have to feed mainly on plankton for year and a half or even two years (Eschbaum et al. 2013). Poor feeding conditions lead to slow growth and high natural mortality during the first years of life, and ultimately to less abundant cohorts available for commercial fishing compared to previous years, when the abundance of lake (dwarf) smelt was high.

It was shown by using an ADAPT-VPA model that dynamics of pike-perch population, which beginning from the 1980s considerably increased, related mainly to ecosystemic transformations taking place in the water body but not to fishery impact (Bobyrev et al., 2013). According to the latest data from scientists the pike-perch stock in Lake Peipus has remained in a satisfactory condition in recent years (ERFC 2015, ERFC 2016, interview with V. Vaino). Thus, there is sufficient evidence to conclude, that the stock of pike-perch is at or fluctuating around a level consistent with MSY. However, uncertainty in the definition of MSY under changing environmental conditions prevents the fishery from reaching the SG100.</td></tr>
</table>

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
References	Bobyrev et al. 2013, ERFC 2015, ERFC 2016, Eschbaum et al. 2013		
Stock Status relative to Reference Points			
	Type of reference point	**Value of reference point**	**Current stock status relative to reference point**
Reference point used in scoring stock relative to PRI (SIa)	No limit reference point is in place for Pike-perch in Lake Peipus.	N/A	N/A
Reference point used in scoring stock relative to MSY (SIb)	F-based	For age 3+ and older pike-perch = $0.1813 \times B_N$ For age 2 pike-perch = $0.1 B_N$	$F \leq 0.1813 \times B_N$ (age 3+ and older) $F \leq 0.1 \times B_N$ (age 2)
OVERALL PERFORMANCE INDICATOR SCORE:			**90**
CONDITION NUMBER (if relevant):			**N/A**

UoA 2: PI 1.1.2 – Stock rebuilding

PI 1.1.2		**Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Rebuilding timeframes**			
	Guidepost	A rebuilding timeframe is specified for the stock that is **the shorter of 20 years or 2 times its generation time**. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.		The shortest practicable rebuilding timeframe is specified which does not exceed **one generation time** for the stock.
	Met?	Not relevant		Not relevant
	Justification	The Lake Peipus pike-perch stock does not require rebuilding and so this PI is not relevant to UoA 2 (pike-perch).		
b	Rebuilding evaluation			
	Guidepost	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is evidence that the rebuilding strategies are rebuilding stocks, **or it is likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.	There is **strong** evidence that the rebuilding strategies are rebuilding stocks, **or it is highly likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	The Lake Peipus pike-perch stock does not require rebuilding and so this PI is not relevant to UoA 2 (pike-perch).		
References				
OVERALL PERFORMANCE INDICATOR SCORE:				**N/A**
CONDITION NUMBER (if relevant):				**N/A**

UoA 2: PI 1.2.1 – Harvest strategy

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Harvest strategy design			
	Guidepost	The harvest strategy is **expected** to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy **work together** towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is **designed** to achieve stock management objectives reflected in PI 1.1.1 SG80.
	Met?	Y	Y	N
	Justification	The harvest strategy for Lake Peipus is based on managing the fishery based on TACs established by Estonian and Russian managers through the Intergovernmental ERFC (established in 1994) for all key commercial species. It is responsive to stock status as it is based on the updated annual estimates of the stock size calculated in the assessment before the season commences. The ERFC meets annually (twice per year 2015 and before), and usually adopts a number of decisions regarding regulation of fisheries. Between these meetings, in-season management in Estonia is performed by Estonian Ministry of Environment. The fishery does not have explicit biological reference points, such as B_{LIM} or B_{MSY}. Instead, a proxy value is used for both TRP and LRP, defined as 30%*Ba* (maximum), where *Ba* is the total commercially available biomass. For perch and pike-perch of Lake Peipus the estimates of *Ba* is used to calculate 20-25% *Ba*, which is equivalent to the target reference point (TRP) as is used with the same intent as F_{MSY}. The TRP (which is also equivalent to the limit reference point (LRP)) based on 20-25% *Ba* is used to establish annual fishing opportunities for perch and pike-perch (in other words determined fishing mortality, which actually considered as $F_{0.2\text{-}0.25} \leq M$, is used with the same intent as F_{MSY}) and this precautionary approach has been demonstrated to effectively keep the stock well above the point at which recruitment would be impaired. The harvest strategy also includes distribution of quota among two countries (Estonia and Russia get equal quota for Peipsi and Lämmijärv, and Russia gets also quota for Lake Pihkva), determining fishing rules separately in Estonia and in Russia which take into account limitation of number and capacity of fishing boats, fishing effects in term of type of fishing gear, seasons of fishing, location of gear. Estonian management system uses so-called Olympic system when quota is not given to each user, and fishing is terminated when quota is approached (roughly 90%). In Estonia, annual quota is subdivided into two parts – for the first and second half a year, and thus fishing may be terminated twice a year. Fishers need to make daily reports and to complete logbook. Estonian fisheries usually use almost entire quota. In Russia, the TAC is subdivided to quota for each user, and each user terminates fishing when quota is approached. Because not all users fully use their quota, part of Russian quota is not taken. This makes exceeding the national quotas in Estonian and Russian parts of the lake difficult. Therefore, the harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80. Hovever, there is insufficient evidence to demonstrate the harvest strategy has been 'designed' to achieve stock management objectives, so SG100 is not met.		
b	Harvest strategy evaluation			

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
	Guidepost	The harvest strategy is **likely** to work based on prior experience or plausible argument.	The harvest strategy may not have been fully **tested** but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been **fully evaluated** and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	Y	Y	N
	Justification	Pike-perch and perch are the most important species within the Lake Peipus fisheries, forming more than 60% of total catch. After a significant reduction of fishing effort due to limitation of use of Danish seines since 1974, pike-perch considerably increased their abundance in Lake Peipsi. According to the recent assessment (Eschbaum et al. 2013, ERFC 2015, ERFC 2016), the Lake Peipus pike-perch stock has remained in satisfactory condition in recent years, and the joint pike-perch TAC for Estonia and Russia in 2016 was established at 1,550 t and in 2017 at 1,810 t. Intensity of pike-perch fishing in Lake Peipus is quite high nowadays, in autumn months it targeting fish under the usual commercial size of 40 cm, at age 3+ (though pike-perch attain fertility at age 4-5 years) and due to this, pike-perch reach the age of only 6-7 years, while older generations constitute less than one percent of the total catch. It should be noted, however, that situation with catches of undersized pike-perch has been kept under close supervision by Estonian and Russian fisheries managers over the years: the goal of current harvest strategy is to keep the explosive population growth of pike-perch given current trophic conditions of the lake, and thereby help restoration of dwarf smelt population, to maintain the stability of the fishing community and to provide sustainability of fishery in future. It was shown by using an ADAPT-VPA model that dynamics of pike-perch population, which beginning from the 1980s considerably increased, related mainly to ecosystemic transformations taking place in the water body but not to fishery impacts (Bobyrev et al. 2013). Thus, the harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives. SG80 is met.		
c	Harvest strategy monitoring			
	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	One of the main objectives of the ERFC is to develop joint research program between the two countries on Lake Peipus. In accordance with this programme, joint monitoring studies (using trawls, trapnets, gillnets) are conducted in the territorial waters of Estonia and Russia during the year, in which specialists from both countries participate. The result of the monitoring surveys are the basis for the determination of fish stocks status (and the setting TAC) in Lake Peipus and also serves as ongoing indicator of the implementation of the commercial fishing strategy at the current moment of time. The Ministry of Agriculture of Estonia is responsible for monitoring and controlling fishing effort and recording detailed catch information by species from the commercial fishery. To facilitate the implementation of fishing monitoring, since 2015, each commercial vessel is equipped with a positioning device - VMS. Information is also collected from the recreational fishery and estimates of under-reporting defined to enable the total catch to be raised. Thus, monitoring is in place to determine whether the harvest strategy is working, and this SG60 requirement is met.		

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
d	Harvest strategy review			
	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			Y
	Justification	Periodically reviewed elements of the harvest strategy include the TAC values and optimal fishing gears and efforts that are determined by ERFC in association with the annually established stock status of various species and their dynamic in the changing ecosystem of Lake Peipus. In the context of the reviewed fishing strategy it should be highlighted also that a more detailed programme of scientific monitoring is undertaken in comparison with previous years, improved reporting of commercial catch (previously – once a month, once every fifteen days, once every five days, now - every day), and improved supervision for the commercial catches caught and landed and fishing efforts used (for example, by binding of the VMS in Estonia since 2015, in Russia - VMS at the administration stage). The new version of the rules of fishing in Estonia entered into force on January 2017. The ERFC meetings provide a good forum for regular reviews of the strategy. Switching the annual meeting of the ERFC from earlier practiced meetings twice a year (before 2015) - this is also a form of periodical review of the element of fisheries management strategy. The systems described above provide a range of evidence to demonstrate that the harvest strategy is reviewed regularly and that improvements have been made, sufficient to meet the requirements at SG100.		
e	Shark finning			
	Guidepost	It is **likely** that shark finning is not taking place.	It is **highly likely** that shark finning is not taking place.	There is a **high degree of certainty** that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	The Lake Peipus fishery occurs in freshwater and sharks are not a target species. This SI is not scored.		
f	**Review of alternative measures**			
	Guidepost	There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
	Met?	Y	N	N
	Justification	Fishing with Danish seines is currently considerably more restricted than in the past. Since 1974, along with the decrease in the number of Danish seines on the lake due to fishing regulations, mesh size in the purse of Danish seines was increased from 8 -12 mm to 20-22 mm.There have been times when fishing with Danish seines was allowed from August to May. Now, however, limited number of Danish seines (20 for both Estonia and Russia) may be used only in autumn totally not more 700 days per year. All fishing methods are subject to strong supervision, which comprises vessel monitoring systems and the requirement to give advance notification of landing catches. Neither Estonia nor Russia has made full use of the agreed fishing period in recent years. Fishing with Danish seines has essentially been limited to around a month on both sides, given that, on average, 31 trips to the lake are undertaken per seine in Estonia and 37 in		

PI 1.2.1		There is a robust and precautionary harvest strategy in place
		Russia during 2009-2013 (Eschbaum et al., 2014). Perch has always been the main target species in this fishing gear, with the proportion of pike-perch being limited to 8–27% and on average to 20%. To ensure that small pike-perch occurring in catches are not discarded unnecessarily, the standard minimum size of pike-perch is reduced for the period of seine fishing in accordance with the general condition of the stock and the strength of future cohorts to be fished. In addition to Danish seines, small pike-perch may be fished in autumn using trapnets (based on the equal right to catch). This approach has served the purpose of reducing discards and thus hidden fishing mortality in autumn fishing. Official catches and analyses thereof allow for the conclusion that, on average, catches of pike-perch smaller than the traditional minimum size do not represent more than 20% of the total annual pike-perch catch i.e. 125 tonnes, at least on the Estonian side. Whilst there is evidence that there are at least regular reviews of measures to minimise UoA-related mortality of unwanted catch of pike-perch, so that SG60 is met, the Assessment Team was made aware of a concern that there is an unknown level of pike-perch mortality occurring in the summer trapnet fishery, which has increased in intensity in the last 3-5 years (V.Vaino, pers. comm., site visit). The Assessment Team was also made aware that there is intent to investigate this issue and that funding was being sought for the work, but had yet to be obtained. However, in the absence of a review of this issue, and the introduction of measures as appropriate to minimise UoA-related mortality from this cause, it is not possible to confirm that the fishery meets SG80, here. As such, a Condition of Certification (#3) is introduced.
References		Bobyrev et al. 2013, ERFC 2014, ERFC 2015, ERFC 2016, Eschbaum et al. 2013.
OVERALL PERFORMANCE INDICATOR SCORE:		**75**
CONDITION NUMBER (if relevant):		**3**

UoA 2: PI 1.2.2 – Harvest control rules and tools

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue		SG 60	SG 80	SG 100
a	HCRs design and application			
	Guidepost	**Generally understood** HCRs are in place **or available** that are **expected** to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	**Well defined** HCRs are **in place** that **ensure** that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock **fluctuating around** a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock **fluctuating at or above** a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, **most** of the time.
	Met?	Y	Y	Y
	Justification	Harvest control rules are based on achieving allocated quota. Quota is set up annually based on stock assessment. TAC and quota are allocated in the beginning of the fishing season and is not corrected based on in-season surveys. Catches are monitored continually and updated daily in Estonia and twice each month on the 15th and 30th in Russia to provide summaries of the current and cumulative catch totals by species. Once the quota for any TAC species is approached (around 90%) the fishery is closed, allowing room for the remainder to be made up of bycatch in fisheries directed at other species. Monitoring of fish populations in Lake Peipus is performed jointly by Estonian and Russian researchers in a framework of co-ordinated research programme. In the process of scientific monitoring, the ecological role of the target stocks at different stages of the life cycle is analysed. For example, stomach contents work in autumn is focused on pike-perch, which can inform the model development and TAC forecast for the following year. If growth of juvenile pike-perch is likely to be slow because of lack of forage fish, then fishing mortality for juvenile pike-perch could increase up to $F_{0.3\text{-}0.4,}$ so less fishing days for Danish seine (a gear with small mesh size) will be recommended for the next year. Typical of most post Soviet Union inland fisheries, fishing opportunities are calculated on an annual basis to take into account inter-annual variability in estimated stock size (i.e. annual changes in *Ba*) and ensures that the exploitation is reduced as stock size declines. As such, annual changes in fishing opportunities are not triggered by a single limit reference point, but rather a proportion of *Ba* such that the exploitation decreases as a function of stock size. It has been noted that as the annual TAC is calculated on the commercially available biomass (*Ba*), not total stock biomass (*Btotal)*. The precautionary harvest strategy will thus always protect a proportion of the juvenile and more productive fish within the population (i.e. larger mature fish), allowing the stock to rebuild, if needed. Furthermore, given that the annual calculation of the perch and pike-perch TAC values is based on the 20-25% of *Ba* (which is lower than recommended 30% of *Ba* - according to the methodology used to determine the TAC), the level of uncertainty is expected to increase with sampling lower levels of biomass within the lake and therefore act to decrease the annual quota at a faster rate at lower stock sizes. However, in practice, a greater reduction of fishing opportunities at lower stock sizes is highly likely to reduce fleet capacity through poor economic performance before a severe reduction of the stock occurs. Annual fishing opportunities are reviewed on an annual basis by the expert review panel within the ERFC and a declining abundance and catch series would be expected to trigger early management action such as a fishing ban by certain gear types (in specified seasons) or total ban on the fishery before biomass is significantly reduced. In addition, the harvest		

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
		control rules and tools are supported by a suite of precautionary management measures and tools as part of the harvest strategy that help prevent the stock status reaching a point of recruitment impairment (PRI). These include both spatial and temporal closures to provide a refuge for proportion of the stock at any one time (all age classes), a defined mesh size range that selects size/age of fish and control over the total number of annual fishing licenses. These relatively simple harvest control rules and tools are appropriate for the scale and intensity of the fishery, keep the stock fluctuating at or above a target level consistent with MSY taking into account the ecological role of the stock most of the time and are deemed sufficient to meet SG100 level.		
b	HCRs robustness to uncertainty			
	Guidepost		The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a **wide** range of uncertainties including the ecological role of the stock, and there is **evidence** that the HCRs are robust to the main uncertainties.
	Met?		Y	N
	Justification	The management system accounts for some uncertainty when setting HCRs. For example, managers estimate the magnitude of mortality from recreational and IUU fishing, and include the estimates in the stock assessment and in the process of allocating the TAC and quotas. However, it is known that, unlike perch, pike-perch is almost never taken in the recreational fishery, and that compare to 1990's the values of IUU catches are much lower. Russian fishers also do not usually take their entire quota because of limited capacity of individual users, and so the entire TAC for the lake is usually underused, but while this provides some robustness for uncertainty, this is not a part of the harvest control mechanism. In recent years, some unaccounted for fishery mortality has appeared for pike-perch. That is why in the calculation model for the TAC, managers allow fishing mortality of $F_{0.2\text{-}0.25}$, but not $F_{0.3.}$ According to assumption of fishery managers, this mortality may originate from the summer trapnet fishery, which has increased in intensity in recent 3-5 years. There is now a proposal to look at this issue, but managers are accounting for this sort of uncertainty and seeking funding for the work (possibly from EU). Thus, the HCRs are likely to be robust to the main uncertainties and the fishery is scored 80.		
c	**HCRs evaluation**			
	Guidepost	There is **some evidence** that tools used **or available** to implement HCRs are appropriate and effective in controlling exploitation.	**Available evidence indicates** that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.	**Evidence clearly shows** that the tools in use are effective in achieving the exploitation levels required under the HCRs.
	Met?	Y	Y	N
	Justification	The management system (the tools in use) has been tested in its current state during more than two decades and proved its effectiveness since stock levels of perch and pike-perch are above the point of recruitment impairment (PRI) and fluctuating around a level consistent with MSY over recent years. But we are not sure whether good stocks levels result from HCRs only or result from other factors as well, such as beneficial shift in climate change for perch and pike-perch. Here the team assumes a precautionary approach and assigns a score of 80, but not 100.		

PI 1.2.2	There are well defined and effective harvest control rules (HCRs) in place	
References	None	
OVERALL PERFORMANCE INDICATOR SCORE:		**85**
CONDITION NUMBER (if relevant):		**N/A**

UoA 2: PI 1.2.3 – Information and monitoring

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Range of information			
	Guidepost	**Some** relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	**Sufficient** relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A **comprehensive range** of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	Y	Y	Y
	Justification	There is sufficient relevant information to support the harvest strategy. Studies of the fishery and its effect on the ecosystem of Lake Peipus have been performed for many years. Lake Peipus was the first water body in Russia where limits on the fishery were introduced, in 1859, and the document was called ‘‘Rules on restrictions of fishing in Lake Peipsi’’. These regulations banned fishing for juveniles and usage of net gear with fine mesh size. The Ministry of Agriculture of Estonia is responsible for organizing commercial fishing and keeping records of commercial fishing on the Estonian side, including managing a fishing vessel register and collecting data on commercial fishing. According to the annual "Programme of joint research of Russia and Estonia at the lakes Peipsi, Teploye and Pskov lakes", which is annexed to the Protocol ERFC, monitoring is carried out during all seasons of the year with the use of different fishing gear (trawl, Danish seine, traps, large-mesh size nets, small mesh size nets). In the course of monitoring research, carried out by both sides independently but using similar methods, a comprehensive range of information is collected and available for managers for analysis; these include the distribution, density, size-age structure of the main commercial fish species, biological characteristics of populations of key fish species (sex, fertility, maturity, food supply), the catch of different fishing gear, values of catches on fishing effort, the nature and intensity of the fishery, and quality of environment. The Ministry of Environment of Estonia is also responsible for organizing recreational fishing and investigating the structure of the catch of recreational fishermen. As a result, the Assessment Team has determined that there is a comprehensive range of information available to support the harvest strategy, including other environmental information in addition to other hydrographic information to help better understand the context of the fishery. Given the scale and intensity of the fishery, this level of information and monitoring meets the requirements at SG60, SG80 and SG100 levels.		
b	Monitoring			
	Guidepost	Stock abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control	Stock abundance and UoA removals are **regularly monitored at a level of accuracy and coverage consistent with the harvest control rule**, and one or more indicators are	**All information** required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent **uncertainties** in

PI 1.2.3		Relevant information is collected to support the harvest strategy		
		rule.	available and monitored with sufficient frequency to support the harvest control rule.	the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	Y	Y	N
	Justification	The harvest control rule is managed on an annual frequency which is appropriate for the management of the stock. Whilst carrying out an commercial fishing on the Peipsi Lake, the Estonian fishery companies meet the requirements of chapter IV "Accounting for fishing" (paragraph 61) relating to the Fishing Act of Estonia (https://www.riigiteataja.ee/en/eli/503082015006/consolide#para9), namely to: *(1) A person who fishes or collects aquatic plants on the basis of a commercial fishing authorisation shall submit catch, collection, transhipment or landing information or other information relating to these works.* *(8) The master or a representative of the master of a fishing vessel with an overall length of 12 meters or more which catches fish at sea shall submit the information relating to fishing by electronic means to the Ministry of Agriculture pursuant to the procedure established in Council Regulation (EC) No 1224/2009 and Commission Implementing Regulation (EC) No 404/2011.* *(13) The master of a fishing vessel which catches fish or receives, transports or processes fish at sea shall notify the Environmental Inspectorate of the ship's entry into a port and of the quantity of fish on board.* The record keeping of the information specified in subsections (1) and (8) of this section is arranged by the Ministry of the Agriculture. According to regulations of the Ministry of the Agriculture onboard each fishing vessel is a fishing logbook, registered with the EEI which specifies the organisation conducting the fishery, the person responsible for fishing (the master, lead men), license number for permission to catch fish, location of fishing activity, details of fishing gear (e.g. mesh size), physical location (coordinates) of unloading of catch of fish, type and number of acceptance documents. The logbook also specifies the person responsible for keeping fishing records in the logbook and the name of each company or team connected with the catch of fish (with the indication of time of each operation). The logbook also records the catch weight of each fish by species (kg) including those retained on board or released. A cumulative catch of fish by species is also maintained. The level of completeness and correctness of maintaining the fishing logbook and filling out of required documentation is regularly checked by the organizations controlling fishing. In addition to commercial catches, an annual stock assessment is conducted before the start of the fishing season by Estonian (Department of Marine Fisheries, University of Tartu) and Russian (Pskov branch of State Research Institute on Lake and River Fisheries) scientists independently to monitor commercial stock abundance (B_N) and available stock biomass (*Ba*) to the fishery. The researchers uses different gear types (trawl, Danish seine, traps, large-mesh size nets, small mesh size nets gillnets) with a gear selectivity similar to that of the commercial fishery to estimate stock biomass. Whilst carrying out scientific monitoring during a whole year, a comprehensive range of biological and ecological information is collected in order to confirm the status of stocks of the main commercial fish species. Given the scale and intensity of the fishery, there is sufficient evidence to monitor stock abundance and UoA removals at a level of accuracy and coverage consistent with the harvest control rules, and one or more indicators are available and monitored with		

PI 1.2.3		Relevant information is collected to support the harvest strategy		
		sufficient frequency to support the harvest control rules. This is sufficient to meet both SG60 and SG80 levels. There is no evidence to demonstrate that there is a good understanding of inherent uncertainties in the information and the robustness of assessment and management to this uncertainty to meet the SG100 level.		
c	Comprehensiveness of information			
	Guidepost		There is good information on all other fishery removals from the stock.	
	Met?		Y	
	Justification	A considerable reduction of the level of illegal catch on Lake Peipus has been noted, in particular in comparison with early post-Soviet period. This is in part due to improvement of activity of the fishing organisations in holding fishery conservation events (i.e., to remove unmarked and lost nets from the water), the optimisation of fishing activities, and because professional fishermen provide constant monitoring and surveillance over the reservoir, including self-policing effect of licensed fishers. Illegal activities especially have reduced since the introduction of VMS in Estonia in 2015. Estimation of the level of recreational fishing is based on questionnaires completed by recreational fishers and organised by the Ministry of the Environment every 3-4 years. In between years, catches are estimated based on ice conditions (availability) and fish size (desirability). In the event that estimates of recreational catch or other mortalities were not accurate, this should be identified quickly through the annual stock assessment process. In recent years, some unaccounted for fishery mortality has appeared for pike-perch. That is why, in the calculation model for the TAC, managers adopt $F_{0.2\text{-}0.25}$, but not $F_{0.3.}$ According to fishery managers, this unaccounted mortality may originate from discarding from the summer trapnet fishery, which has increased in intensity in recent 3-5 years. There is now a proposal to look at this issue, but funding is being sought (possibly from EU) to work on this issue. Overall, it is considered that there is good information about all fishery removals from the stock and so SG80 is met..		
References		None		
OVERALL PERFORMANCE INDICATOR SCORE:				**90**
CONDITION NUMBER (if relevant):				**N/A**

UoA 2: PI 1.2.4 – Assessment of stock status

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Appropriateness of assessment to stock under consideration			
	Guidepost		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?		Y	N
	Justification	The assessment method is used to estimate biological reference points to manage the fishery under an annual quota system. The stock assessment is based on results of annual trawl surveys implemented by Estonian and Russian sides independently. Scientists of both countries estimate stock status based on available data about the amount and size-age composition of catches (see details in Section 3.5.5, above). Pike-perch are not taken by recreational fishermen in significant numbers. The assessment of the stock is appropriate both for the stock and for the implemented harvest control rules. This is sufficient to meet the requirements at SG80.		
b	Assessment approach			
	Guidepost	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	
	Met?	Y	Y	
	Justification	Stock assessments for all commercial fishes including perch and pike-perch are carried out by the scientists of Estonia and Russia ERFC to estimate the commercially available biomass (*Ba*) on an annual basis. TACs are determined based on a principle of optimal removals suggested by Tjurin (1967), according to which the appropriate level of commercial fish mortality should not exceed the natural mortality coefficient. Considering that usually the coefficient of natural mortality for fish targeted by commercial fishing is approximately 30%, the TAC in consequence is set at approximately the same value. This principle of stock management according to Tjurin (1967) has been used for a number of years in freshwater fisheries in the former Soviet Union, and has shown to be very effective in maintaining populations For perch and pike-perch of Lake Peipus the estimates of *Ba* is used to calculate 20-25% *Ba*, which is equivalent to the target reference point (TRP) as is used with the same intent as F_{MSY}. The TRP (which is also equivalent to the limit reference point (LRP) based on 20-25% *Ba* is used to establish annual fishing opportunities for perch and pike-perch (in other words determined fishing mortality, which actually considered as $F_{0.2\text{-}0.25} \leq M$, is used with the same intent as F_{MSY}) and this precautionary approach has been demonstrated to effectively keep the stock well above the point at which recruitment would be impaired. This approach is considered appropriate for the scale and intensity of the fishery and as a result the team assigns a score of 80 to this SI.		
c	Uncertainty in the assessment			
	Guidepost	The assessment **identifies major sources** of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a **probabilistic** way.
	Met?	Y	N	N
	Justific	The assessment identifies major sources of uncertainty. The ultimate values for non-		

PI 1.2.4		There is an adequate assessment of the stock status		
	ation	commercial and IUU removals and discard mortality are determined by expert review of fishery scientists of both countries at joint ERFC, but the Assessment Team has not seen a clear explanation of the methodology employed. Essentially, it is clear that the assessment identifies major sources of uncertainty, but it is not apparent how this uncertainty is taken in to account. As such, the fishery meets the requirements at SG60 but not SG80, and a Condition of Certification is set (#4).		
d	Evaluation of assessment			
	Guidepost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			N
	Justification	There is no evidence to indicate the assessment method have been tested and explored and that alternative hypotheses have been rigorously explored to meet the requirements at the SG100 level.		
e	Peer review of assessment			
	Guidepost		The assessment of stock status is subject to peer review.	The assessment has been **internally and externally** peer reviewed.
	Met?		Y	Y
	Justification	Each year at the end of October, Estonian and Russian ichthyologists independently undertake stock assessments of different fish species in Lake Peipus, and develop recommendations for TACs and fishing regimes for the next year. After that, each country holds one or more meetings of their fishery councils with representatives from the plurality of stakeholders (in Estonia - Ministry of Agriculture, Ministry of Environment, State University, Marine Institute, Fishery Associations, NGOs, fishery oversight authority, fishermen and other interested parties), where all these issues are discussed. At the same time Estonian and Russian scientists hold bilateral consultations, during which they produce estimates of stock status of commercial fish species, recommendations for TAC values, fishery bases and fishery regimes for the next year. Before entering these materials in the ERFC commission, Russian assessments and recommendations have to be approved by State Ecological Expertise which is independent of the fishery management system. At the end of November, at the ERFC meeting, each party's assessments are reviewed by the other party, before the heads of Estonian and Russian delegations sign the final protocol, which set values of TACs for different fishes and fishing regimes for both countries. By the end of year, the Protocols of the ERFC are approved by the Ministry of Environment in Estonia, and by the Federal Agency for Fisheries in Russia. After the Protocols are signed, they have the force of law in both countries. Thus, since the multi-stage approval process of stock status, TACs and fishing regimes implies mutual checks at the level of the two countries, the assessment is considered to be internally and externally peer reviewed, so meeting the SG100 level of performance.		
References		Tjurin, 1967; Ricker, 1979; Rudenko, 1985; Sechin, 1990; Shibayev, 2014.		
OVERALL PERFORMANCE INDICATOR SCORE:				**75**
CONDITION NUMBER (if relevant):				**4**

Principle 2 scoring tables

PI 2.1.1 – Primary species outcome

PI 2.1.1		The UoA aims to maintain primary species above the PRI and does not hinder recovery of primary species if they are below the PRI.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Main primary species stock status**			
	Guidepost	Main primary species are **likely** to be above the PRI OR If the species is below the PRI, the UoA has measures in place that are **expected** to ensure that the UoA does not hinder recovery and rebuilding.	Main primary species are **highly likely** to be above the PRI OR If the species is below the PRI, there is either **evidence of recovery** or a demonstrably effective strategy in place **between all MSC UoAs which categorise this species as main**, to ensure that they collectively do not hinder recovery and rebuilding.	There is a **high degree of certainty** that main primary species are above the PRI **and are** fluctuating around a level consistent with MSY.
	Met?	Y	Y	Bream – Y Roach and Pike – N Pike-perch (P2 in UoA 1) – N Perch (P2 in UoA 2) – N
	Justification	'Primary species' are defined by the MSC as those that are in scope but not target (P1) species "*where management tools and measures are in place, intended to achieve stock management objectives reflected in either limit or target reference points*" (MSC 2014). A 'main' designation is then given where either i) "*the catch of a species by the UoA comprises 5% or more by weight of the total catch of all species by the UoA*", ii) "*the species is classified as 'less resilient' and the catch of the species by the UoA comprises 2% or more by weight of the total catch of all species by the UoA*", or iii) in cases where the total catch of the UoA is exceptionally large, such that even small catch proportions of a P2 species significantly impact the affected stocks/populations. Main primary species for the Lake Peipus Perch and Pike-perch Fishery were determined to be common bream, roach and pike, which comprised an average of 31.3%, 10.1% and 4.8% of the catch, respectively, for the period 2014-2015 (Table 21 and Table 22). SA 3.1.3.1 (MSC 2014) also requires that pike-perch is considered as a P2 species in scoring UoA 1 (Perch), and that perch is considered as a P2 species in scoring UoA 2 (Pike-perch); in both cases, these were assessed as main primary species. Lake Peipus common bream stock status has improved in recent years, and is currently described as good, with stock and yield at a high level, and with abundant incoming year classes (EMI 2017). Roach and pike are both in moderate to good condition, with stocks mainly made up of fish from the 2009-2011 year classes because low water levels mean that more recent year classes have been weak (EMI 2017). Perch and pike-perch stocks are currently healthy, and are being supported by abundant 2012 and 2015 year classes. In all cases, stock status indicates that main primary species are highly likely to be above the PRI, and so a score of 80 is awarded. Bream also meets the SG100 level because the incoming years classes are abundant, while a higher score is not given for roach and pike		

PI 2.1.1		The UoA aims to maintain primary species above the PRI and does not hinder recovery of primary species if they are below the PRI.		
		because of the recent weak incoming year classes. As noted in scoring Principle 1, the perch and pike-perch stocks are considered to be fluctuating around MSY, but uncertainty in the definition of MSY under changing environmental conditions precludes a score of 100, here.		
b	Minor primary species stock status			
	Guidepost			Minor primary species are highly likely to be above the PRI OR If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species
	Met?			Vendace and ruffe – Y Burbot and P. whitefish – N
	Justification	Minor primary species for the Lake Peipus Perch and Pike-perch Fishery are considered to be burbot, vendace, ruffe and Peipsi whitefish. Burbot and vendace each comprised just less than 1% of the catch from the fishery in 2014 and 2015, whilst ruffe and Peipsi whitefish comprised around 0.1-0.2% and 0.01-0.02% of the catch in the same years (Table 21 and Table 22). Stocks of all four minor primary species in Lake Peipus are currently considered to be low (EMI 2017). Environmental conditions within the lake for cold, clean water species (burbot, vendace and Peipsi whitefish) are very poor, with reduced periods of ice-cover and higher levels of nutrients leading to increased weed cover and periods of low dissolved oxygen. No changes to this regime are expected in the near future. Ruffe suffered largescale mortalities in the early 2000s, and they have not recovered their previous abundance although Estonian fishing mortality is low (EMI 2017). Whilst environmental conditions are the primary driver of poor stock status in these species, the Assessment Team is not aware of any analysis showing that the fishery does not hinder the recovery and rebuilding of burbot or Peipsi whitefish; as such, these species do not meet this SG100 level requirement. The vendace stock status has improved recently, though, and the fishery for this species has been reopened (with a fishing mortality rate of 0.1). There is also a low Estonian fishing mortality of ruffe, which is sufficient evidence to show that the UoA does not hinder recovery and rebuilding of these species, so meeting SG100.		
References		EMI 2017, MSC 2014.		
OVERALL PERFORMANCE INDICATOR SCORE:				85
CONDITION NUMBER (if relevant):				N/A

PI 2.1.1 Scoring calculation

UoAs	Species	Main / minor	SIa (60, 80, 100)	SIb (100 only)	Element Score	PI Score
1	Common bream	Main	100	-	100	85
	Roach	Main	80	-	80	
	Pike	Main	80	-	80	
	Pike-perch	Main	80	-	80	
	Burbot	minor	-	Doesn't meet 100 so default 80	80	
	Vendace	minor	-	100	100	
	Ruffe	minor	-	100	100	
	Peipsi whitefish	minor	-	Doesn't meet 100 so default 80	80	
2	Common bream	Main	100	-	100	85
	Roach	Main	80	-	80	
	Pike	Main	80	-	80	
	Perch	Main	80	-	80	
	Burbot	minor	-	Doesn't meet 100 so default 80	80	
	Vendace	minor	-	100	100	
	Ruffe	minor	-	100	100	
	Peipsi whitefish	minor	-	Doesn't meet 100 so default 80	80	

PI 2.1.2 – Primary species management strategy

PI 2.1.2		There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Management strategy in place**			
	Guidepost	There are **measures** in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to above the point where recruitment would be impaired.	There is a **partial strategy** in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the point where recruitment would be impaired.	There is a **strategy** in place for the UoA for managing main and minor primary species.
	Met?	Y	Y	Y
	Justification	Main primary species for the Lake Peipus Perch and Pike-perch Fishery were determined to be common bream, roach and pike. SA 3.1.3.1 (MSC 2014) also requires that pike-perch is considered as a P2 species in scoring UoA 1 (Perch), and that perch is considered as a P2 species in scoring UoA 2 (Pike-perch); in both cases, these were assessed as main primary species. Minor primary species were determined to be burbot, vendace, ruffe and Peipsi whitefish. Management of the Lake Peipus fishery is relatively intensive, with the objective of maintaining healthy status of different stocks within the fishery. Annual fishery-independent surveys and assessments of stock status are undertaken to inform the management process (e.g., EMI 2017). Quotas are set to maintain fishing mortality at acceptable levels, mesh sizes of different gears are set to minimize the risk of capturing small/undersize individuals, and consideration is given to closing fishing operations at times or locations when species are particularly vulnerable to capture (e.g., no fishing is permitted within 500 m of river mouths entering the lake). All vessels (except rowing boats) are fitted with VMS, enforcement is undertaken at a high level (approximately 11% of fishing trips are monitored either on the lake or at landing; I. Kask, pers. comm.) and quotas are very closely monitored, with landing records being submitted daily and quota uptake monitored in near real-time (L. Naks, pers. comm.). The annual quota is divided in to two six-month periods, and directed fishing for each species ceases when the quota uptake is around 90%, allowing for the remainder to be taken as bycatch while directing for other species. Together, and given the scale and intensity of the fishery, the approach combines to form a strategy for the UoA for managing main and minor species – SG100 is met.		
b	**Management strategy evaluation**			
	Guidepost	The measures are considered **likely** to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some **objective basis for confidence** that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	**Testing** supports **high confidence** that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	Y
	Justification	The management approach taken for primary species in Lake Peipus is comprehensive and the quota management process in particular is tightly controlled, such that there have been no quota overruns in the last eight years (Table 23). This provides an objective basis		

PI 2.1.2		There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch.		
		or confidence that the strategy will work, based on information directly about the fishery – SG80 is met. In looking at the SG100 requirement of testing supporting high confidence that the strategy will work, a review of the fishery was undertaken by Bobyrev et al. (2013), which utilised an ADAPT virtual population analysis to reconstruct the dynamics of total stock biomass and fishing mortality of eight main commercial fish stocks in Lake Peipus. Their results showed that fluctuations in the fish stocks were related mainly to ecosystemic changes taking place in the water body, rather than to fishing activity; therefore, SG100 is met.		
c	**Management strategy implementation**			
	Guidepost		There is **some evidence** that the measures/partial strategy is being **implemented successfully**.	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a).
	Met?		Y	Y
	Justification	The fishery management strategy in Lake Peipus is comprehensive, and enforcement is undertaken at a relatively high level. The Assessment Team was made are of some regulatory infringements, but quota uptake, for example, is very closely monitored and is demonstrably being managed appropriately (e.g., see Table 23). It is considered that there is clear evidence that the strategy is being implemented successfully and is achieving its overall objective of maintaining healthy status of different stocks within the fishery; SG100 is met.		
d	**Shark finning**			
	Guidepost	It is **likely** that shark finning is not taking place.	It is **highly likely** that shark finning is not taking place.	There is a **high degree of certainty** that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	Lake Peipus is a freshwater lake and sharks are not present; this SI is not scored.		
e	**Review of alternative measures**			
	Guidepost	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate.
	Met?	Y	Y	N
	Justification	The management process includes an annual bilateral meeting between Estonia and Russia through the ERFC (e.g., ERFC 2015, ERFC 2016). During this meeting, consideration is given to population structure and fishing mortality of different species, and measures to		

PI 2.1.2		**There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch.**
		minimize unwanted catch and mortality. Measures that are considered for minimizing unanted mortality, and then implemented, include that, in periods when there is a higher abundance of smaller pike-perch in the stock, the MLS for pike-perch caught in the seine fishery is reduced. Similarly, directed fishing for primary species is curtailed when approximately 90% of the quota is taken, leaving the rest for catches in other parts of the fishery. It is not clear that particular attention is paid to minor primary species, however, so SG80 is met but not SG100.
References		Bobyrev et al. 2013, EMI 2017, ERFC 2015, ERFC 2016.
OVERALL PERFORMANCE INDICATOR SCORE:		**95**
CONDITION NUMBER (if relevant):		**N/A**

PI 2.1.3 – Primary species information

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
Scoring Issue		SG 60	SG 80	SG 100
a	**Information adequacy for assessment of impact on main primary species**			
	Guidepost	Qualitative information is **adequate to estimate** the impact of the UoA on the main primary species with respect to status. OR **If RBF is used to score PI 2.1.1 for the UoA**: Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is **adequate to assess** the impact of the UoA on the main primary species with respect to status. OR **If RBF is used to score PI 2.1.1 for the UoA:** Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is **adequate to assess with a high degree of certainty** the impact of the UoA on main primary species with respect to status.
	Met?	Y	Y	Y
	Justification	Main primary species for the Lake Peipus Perch and Pike-perch Fishery were determined to be common bream, roach and pike. SA 3.1.3.1 (MSC 2014) also requires that pike-perch is considered as a P2 species in scoring UoA 1 (Perch), and that perch is considered as a P2 species in scoring UoA 2 (Pike-perch); in both cases, these were assessed as main primary species. Minor primary species were determined to be burbot, vendace, ruffe and Peipsi whitefish. Annual fishery-independent surveys and assessments of stock status, covering both the Estonian and Russian parts of the lake, are undertaken to inform the management process, which is coordinated through the ERFC to maintain fishing mortality at acceptable levels. Catches and quota uptake are very closely monitored. In Estonia, landing records are submitted daily and quota uptake monitored in near real-time. The annual quota is divided in to two six-month periods, and directed fishing for each species ceases when the quota uptake is around 90%, allowing for the remainder to be taken as bycatch while directing for other species. Reports of performance for the Estonian and Russian fisheries are produced annually (e.g. EMI 2017). Relative to the scale and intensity of the fishery, it is considered that quantitative information is available and is adequate to assess with a high degree of certainty the impact of the UoA on main primary species with respect to status; SG100 is met.		
b	**Information adequacy for assessment of impact on minor primary species**			
	Guidepost			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.
	Met?			Y
	Justification	As noted for SIa, fishery-independent surveys and assessments of stock status are undertaken annually, and catch data for all species are collected on a daily basis. This is adequately demonstrates that some quantitative information is adequate to estimate the		

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
		impact of the UoA on minor primary species with respect to status, and so this SG100 requirement is met.		
c	Information adequacy for management strategy			
	Guidepost	Information is adequate to support **measures** to manage **main** primary species.	Information is adequate to support a **partial strategy** to manage **main** Primary species.	Information is adequate to support a **strategy** to manage **all** primary species, and evaluate with a **high degree of certainty** whether the strategy is achieving its objective.
	Met?	Y	Y	Y
	Justification	As noted in PI 2.1.2, management of the Lake Peipus fishery is relatively intensive, with the objective of maintaining healthy status of different stocks within the fishery. The key features of the strategy include that fishery-independent surveys and assessments are undertaken annually, quota is tightly controlled and enforcement is undertaken at a relatively high level. Overall, these features mean that information is adequate to support a strategy to manage all primary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective; SG100 is met.		
References		EMI 2017.		
OVERALL PERFORMANCE INDICATOR SCORE:				100
CONDITION NUMBER (if relevant):				N/A

PI 2.2.1 – Secondary species outcome

PI 2.2.1		The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Main secondary species stock status**			
	Guidepost	Main Secondary species are **likely** to be within biologically based limits. OR If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.	Main secondary species are **highly likely** to be above biologically based limits OR If below biologically based limits, there is either **evidence of recovery** or a **demonstrably effective partial strategy** in place such that the UoA does not hinder recovery and rebuilding. AND Where catches of a main secondary species outside of biological limits are considerable, there is either evidence of recovery or a, demonstrably effective strategy in place between those MSC UoAs that also have considerable catches of the species, to ensure that they collectively do not hinder recovery and rebuilding.	There is a **high degree of certainty** that main secondary species are within biologically based limits.
	Met?	Y	Y	Y
	Justification	'Secondary species' are defined by the MSC as those species that are not considered to be 'primary' species (i.e., where there are not "*management tools and measures in place that are intended to achieve stock management objectives reflected in either limit or target reference points*"), or species that are out of scope of the program, but where the definition of ETP species is not applicable (MSC 2014). As for primary species (See PI 2.1.1), the 'main' designation is then given where either i) "*the catch of a species by the UoA comprises 5% or more by weight of the total catch of all species by the UoA*", ii) "t*he species is classified as 'less resilient' and the catch of the species by the UoA comprises 2% or more by weight of the total catch of all species by the UoA*", or iii) in cases where the total catch of the UoA is exceptionally large, such that even small catch proportions of a P2 species significantly impact the affected stocks/populations. On this basis, there are no main secondary species in the catch, and so the Lake Peipus Perch and Pike-perch Fishery meets the SG100 level of performance by default for this SI.		
b	**Minor secondary species stock status**			
	Guidepost			Minor secondary species are highly likely to be above biologically based limits. OR

PI 2.2.1		The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit.		
				If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species
	Met?			N
	Justification	The only minor secondary species that is taken by the fishery is Crucian carp, which comprised 0.1-0.2% of the catch in 2014 and 2015 (Table 21 and Table 22). The catch is monitored and managed through a 25 t quota for 'other species', and the catch (as a general measure of stock status) has increased considerably in recent years relative to the past (3 t in 2015 compared with 10-20 kg in 2008-2013). The Assessment Team employed the risk-based framework (RBF) and conducted a productivity-susceptibility analysis (PSA) for Crucian carp on a precautionary basis. The results of the analysis are presented in Appendix 2, and show that Crucian carp was scored at 95. Nevertheless, no stakeholders were consulted for the susceptibility components of the PSA, and so the results are not used in the assessment of the fishery. The fishery therefore cannot be said to meet this SG100 requirement.		
References		MSC 2014.		
OVERALL PERFORMANCE INDICATOR SCORE:				**90**
CONDITION NUMBER (if relevant):				**N/A**

PI 2.2.1 Scoring calculation

UoAs	Species	Main / minor	SIa (60, 80, 100)	SIb (100 only)	Element Score	PI Score
1 & 2	None	Main	100	-	100	90
	Crucian carp	minor	-	Doesn't meet 100 so default 80	80	

PI 2.2.2 – Secondary species management strategy

PI 2.2.2		There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Management strategy in place**			
	Guidepost	There are **measures** in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be within biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a **partial strategy** in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be within biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a **strategy** in place for the UoA for managing main and minor secondary species.
	Met?	Y	Y	N
	Justification	There are no main secondary species taken in the Lake Peipus Perch and Pike-perch Fishery, and the only minor secondary species was determined to be Crucian carp. As noted in PI 2.1.2, management of the Lake Peipus fishery is relatively intensive, with the objective of maintaining healthy status of different stocks within the fishery. Management is focused on the more important commercial species, however, and there is relatively little emphasis on species making up the remainder. Crucian carp is the only species in this group making up more than a negligible proportion of the catch from the Lake Peipus Perch and Pike-perch Fishery. Nevertheless, annual fishery-independent surveys are undertaken that help to inform managers of trends in stock status, even if full assessments of stock status are not undertaken for species such as Crucian carp. Catches of Crucian carp are counted against a 25 t quota for 'other' species, and quotas are very closely monitored, with landing records being submitted daily and quota uptake monitored in near real-time (L. Naks, pers. comm.). All vessels (except rowing boats) are fitted with VMS, and enforcement is undertaken at a high level (approximately 11% of fishing trips are monitored either on the lake or at landing; I. Kask, pers. comm.) There are no main secondary species and so the SG80 level of performance is met by default. However, the limited management focus on minor secondary species (i.e., Crucian carp) means the fishery does not quite meet the SG100 level of performance.		
b	**Management strategy evaluation**			
	Guidepost	The measures are considered **likely** to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).	There is **some objective basis for confidence** that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.	**Testing** supports **high confidence** that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.
	Met?	Y	Y	N
	Justification	Because Crucian carp is a minor species, SG80 is met by default. The management approach taken for secondary species in Lake Peipus is considered to comprise a partial strategy. Crucian carp is managed as part of the 'other species' group which has a quota of 25 t, and quotas are tightly controlled. However, it is not clear that		

PI 2.2.2		There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch.		
		any testing has been undertaken to show that this level of quota is appropriate, so SG100 is not met.		
c	**Management strategy implementation**			
	Guidepost		There is **some evidence** that the measures/partial strategy is being **implemented successfully**.	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a).
	Met?		Y	N
	Justification	Because Crucian carp is a minor species, SG80 is met by default. Catches of Crucian carp have increased considerably in recent years, and this presents some evidence at least that the partial strategy is being implemented successfully and is achieving its objective of maintaining healthy status of different stocks within the fishery. However, it is not sufficient to meet the SG100 requirement of 'clear' evidence, and so SG100 is not met.		
d	**Shark finning**			
	Guidepost	It is **likely** that shark finning is not taking place.	It is **highly likely** that shark finning is not taking place.	There is a **high degree of certainty** that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	Lake Peipus is a freshwater lake and sharks are not present; this SI is not scored.		
e	**Review of alternative measures to minimise mortality of unwanted catch**			
	Justification	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of **unwanted** catch of main secondary species.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of **unwanted** catch of main secondary species and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of **unwanted** catch of all secondary species, and they are implemented, as appropriate.
	Met?	Y	Y	N
	Guidepost	The management process includes an annual bilateral meeting between Estonia and Russia through the ERFC (e.g., ERFC 2015, ERFC 2016). During this meeting, consideration is given to population structure and fishing mortality of different species, and measures to minimize unwanted catch and mortality. It is not clear that particular attention is paid to minor secondary species, however, so SG80 is met by default but not SG100.		
References		ERFC 2015, ERFC 2016		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				**N/A**

PI 2.2.3 – Secondary species information

PI 2.2.3		Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Information adequacy for assessment of impacts on main secondary species**			
	Guidepost	Qualitative information is **adequate to estimate** the impact of the UoA on the main secondary species with respect to status. OR **If RBF is used to score PI 2.2.1 for the UoA:** Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	Some quantitative information is available and **adequate to assess** the impact of the UoA on main secondary species with respect to status. OR **If RBF is used to score PI 2.2.1 for the UoA:** Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	Quantitative information is available and **adequate to assess with a high degree of certainty** the impact of the UoA on main secondary species with respect to status.
	Met?	Y	Y	Y
	Justification	There are no main secondary species taken in the Lake Peipus Perch and Pike-perch Fishery. As such, the fishery meets the SG100 level of performance by default.		
b	**Information adequacy for assessment of impacts on minor secondary species**			
	Guidepost			Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.
	Met?			N
	Justification	The only minor secondary species taken in more than negligible quantities was determined to be Crucian carp. Only in 2014 and 2015 has this species become more significant in the catches, with 3 t taken in the fishery in 2015 but only 10-20 kg being reported per year for all Estonian fishermen in lake Peipus for 2008-2011 (Table 23). Whilst an increase in catches probably indicates that the population of this species has grown, it is not possible to confirm that with respect to status. As such, this SG100 requirement is not met.		
c	**Information adequacy for management strategy**			
	Guidepost	Information is adequate to support **measures** to manage **main** secondary species.	Information is adequate to support a **partial strategy** to manage **main** secondary species.	Information is adequate to support a **strategy** to manage **all** secondary species, and **evaluate** with a **high degree of certainty** whether the strategy is **achieving its objective**.
	Met?	Y	Y	N
	Justification	There are no main secondary species taken in the Lake Peipus Perch and Pike-perch Fishery. As such, the fishery meets the SG80 level of performance by default.		

PI 2.2.3		**Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species.**
		It is considered that there is a partial strategy, only, in place for Crucian carp, and information is not considered adequate to evaluate with a high degree of certainty whether a strategy for Crucian carp would be meeting its objective; as such, SG100 is not met.
References		None
OVERALL PERFORMANCE INDICATOR SCORE:		**85**
CONDITION NUMBER (if relevant):		**N/A**

PI 2.3.1 – ETP species outcome

PI 2.3.1		The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	**Effects of the UoA on population/stock within national or international limits, where applicable**			
	Guidepost	Where national and/or international requirements set limits for ETP species, the effects of the UoA on the population/stock are known and **likely** to be within these limits.	Where national and/or international requirements set limits for ETP species, the **combined effects of the MSC UoAs** on the population/stock are known and **highly likely** to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a **high degree of certainty** that the **combined effects of the MSC UoAs** are within these limits.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	This SI is not scored as there are no national limits for ETP species.		
b	**Direct effects**			
	Guidepost	Known direct effects of the UoA are likely to not **hinder recovery** of ETP species.	Known direct effects of the UoA are **highly likely** to not **hinder recovery** of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species.
	Met?	Y	Y	N
	Justification	ETP species are defined by the MSC (MSC 2014) as species that are: v) Recognised by national ETP legislation, vi) Listed on Appendix I of CITES (unless it can be shown that the particular stock of the CITES listed species impacted by the UoA under assessment is not endangered), vii) Listed in any binding agreements concluded under the Convention on Migratory Species (CMS), or viii) Classified as 'out-of scope' (amphibians, reptiles, birds and mammals) that are listed in the IUCN Redlist as vulnerable (VU), endangered (EN) or critically endangered (CE). For the Lake Peipus Perch and Pike-perch Fishery, only asp and wels catfish were determined to be ETP species. Both species were reported by stakeholders to be taken in the fishery very rarely, and any that are taken must be returned to the water immediately upon capture. This is sufficient to meet the SG80 level of performance, but the Assessment Team was not presented with evidence to show that there is a high degree of confidence that there are no significant detrimental effects; as such, SG100 is not met.		
c	**Indirect effects**			
	Guidepost		Indirect effects have been considered and are thought to be **highly likely** to not create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		Y	N
	Justification	Indirect effects from the Lake Peipus Perch and Pike-perch Fishery are considered to include disturbance with feeding or spawning activities and reductions in prey availability caused by the fishing activity.		

PI 2.3.1		The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species
		Asp migrate in to rivers to spawn, which takes them outside of the fishing area. Male wels catfish establish and defend territories for spawning, but wels catfish is typically a riverine (river-living) rather than a lacustrine (lake-living) fish, and the fishery is prosecuted in the lake, only, and fishing locations tend to be relatively fixed in space. Overall, it is considered highly likely that the fishery is not creating unacceptable impacts with respect to spawning. Both asp and wels catfish are piscivorous, and so there is potential for the fishery to impact these species indirectly through overharvest of the prey species. However, the fishery is managed to maintain healthy stocks and there is no evidence that the suite of species present within the Lake is currently being overharvested. It is therefore highly likely to not create unacceptable impacts with respect to prey availability. Overall, the fishery meets SG80, but in the absence of a detailed review of the issues it is not possible to confirm that the fishery meets the SG100 level of performance.
References		None
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		**N/A**

PI 2.3.2 – ETP species management strategy

PI 2.3.2		**The UoA has in place precautionary management strategies designed to:** • **meet national and international requirements;** • **ensure the UoA does not hinder recovery of ETP species.** **Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Management strategy in place (national and international requirements)**			
	Guidepost	There are **measures** in place that minimise the UoA-related mortality of ETP species, and are expected to be **highly likely to achieve** national and international requirements for the protection of ETP species.	There is a **strategy** in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be **highly likely to achieve** national and international requirements for the protection of ETP species.	There is a **comprehensive strategy** in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to **achieve above** national and international requirements for the protection of ETP species.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	This SI is not scored as there are no national limits for ETP species		
b	**Management strategy in place (alternative)**			
	Guidepost	There are **measures** in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a **strategy** in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a **comprehensive strategy** in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species
	Met?	Y	N	N
	Justification	For the Lake Peipus Perch and Pike-perch Fishery, only asp and wels catfish were determined to be ETP species. The fishery has a number of measures in place which are expected to ensure that the UoA does not hinder the recovery of asp and wels catfish. These include that these species are generally required to be returned upon capture, and that fishing is prohibited within 500 m of river mouths, which helps to prevent capture during upriver spawning migration; these are expected to ensure the UoA does not hinder the recovery of ETP species, and so SG60 is met. However, it is not possible to say that there is a strategy in place for ETP species, in particular because there appears to be no general requirement to report captures of ETP species, such that information on interactions is anecdotal, only (albeit that stakeholders corroborated the assertion that these species are very rarely taken in the fishery). In the absence of a strategy for ETP species, SG80 is not met, and a Condition of Certification (#5) is set.		
c	**Management strategy evaluation**			
	Guidepost	The measures are **considered likely** to work, based on **plausible argument** (e.g., general experience, theory or	There is an **objective basis for confidence** that the measures/strategy will work, based on **information** directly	The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a **quantitative analysis**

PI 2.3.2		**The UoA has in place precautionary management strategies designed to:** • **meet national and international requirements;** • **ensure the UoA does not hinder recovery of ETP species.** **Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.**		
		comparison with similar fisheries/species).	about the fishery and/or the species involved.	supports **high confidence** that the strategy will work.
	Met?	Y	N	N
	Justification	The general requirement to return all asp and catfish, and the prohibition of fishing within 500 m of river mouths is considered likely to work to ensure the UoA does not hinder the recovery of ETP species, based on plausible argument; SG60 is met. However, in the absence of any data on captures and the condition of the fish upon release, it is not possible to say that there is an objective basis for confidence that the measures/strategy will work. As such, SG80 is not met. The same Condition of Certification is set as for SIb (#5), as the requirements for SIb and SIc are closely linked.		
d	**Management strategy implementation**			
	Guidepost		There is some **evidence** that the measures/strategy is being implemented successfully.	There is **clear evidence** that the strategy/comprehensive strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b).
	Met?		Y	N
	Justification	The measures that are relevant to ETP species (including that asp and wels catfish must be returned, and a prohibition on fishing within 500 m of river mouths) are understood to be adhered to, and can be monitored effectively through the requirement for all vessels (other than rowing boats) to be equipped with a VMS, while through a relatively high level of on-lake and at landing inspections (equivalent to about 11% of all trips – I. Kask, pers. comm.). This comprises evidence that the measures are being implemented successfully; SG80 is met. However, in the absence of a strategy, it is not possible to score higher.		
e	**Review of alternative measures to minimize mortality of ETP species**			
	Guidepost	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate.
	Met?	Y	N	N
	Justification	The implementation of measures to minimize UoA-related mortality of ETP species has required that a review has been conducted, and there is consideration of asp and catfish stock status in the annual Estonian science review (e.g., EMI 2017). As such, SG60 is met. However, it is not clear that there is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and that they are implemented as appropriate. SG80 is therefore not met, and so a Condition of Certification is implemented (#6).		
References		EMI 2017.		
OVERALL PERFORMANCE INDICATOR SCORE:				**65**
CONDITION NUMBER (if relevant):				**5 & 6**

PI 2.3.3 – ETP species information

PI 2.3.3		Relevant information is collected to support the management of UoA impacts on ETP species, including: • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Information adequacy for assessment of impacts**			
	Guidepost	Qualitative information is **adequate to estimate** the UoA related mortality on ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Qualitative information is **adequate to estimate productivity and susceptibility** attributes for ETP species.	Some quantitative information is **adequate to assess** the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.	Quantitative information is available to assess with a high degree of certainty the **magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status** of ETP species.
	Met?	Y	N	N
	Justification	For the Lake Peipus Perch and Pike-perch Fishery, only asp and wels catfish were determined to be ETP species. Both species were reported by stakeholders to be taken in the fishery very rarely, and there is a general requirement to return any that are caught to the water. This qualitative information is adequate to estimate the UoA related mortality on ETP species; SG60 is met. However, there is no quantitative information available that is adequate to assess the UoA related mortality, and so SG80 is not met. As such, a Condition of Certification is set (#7).		
b	**Information adequacy for management strategy**			
	Guidepost	Information is adequate to support **measures** to manage the impacts on ETP species.	Information is adequate to measure trends and support a **strategy** to manage impacts on ETP species.	Information is adequate to support a **comprehensive strategy** to manage impacts, minimize mortality and injury of ETP species, and evaluate with a **high degree of certainty** whether a strategy is achieving its objectives.
	Met?	Y	N	N
	Justification	Relevant information that is available includes knowledge of asp and wels catfish spawning behaviours and habitat preferences, and some data on population status is collected through the annual fishery-independent surveys undertaken on Lake Peipus (albeit that these surveys are not designed to monitor these species). VMS data are also collected routinely on the fishery that help to enforce the prohibition on fishing within 500 m of river mouths, while enforcement is conducted at a relatively high level and will support the general requirement to return asp and wels to the water; SG60 is clearly met. However,		

PI 2.3.3		**Relevant information is collected to support the management of UoA impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**
		information is not adequate to measure trends and support a strategy to manage impacts on ETP species; as such, SG80 is not met. The same Condition of Certification is set as for SIb (#7), as the requirements for SIb and SIc are closely linked.
References		None
OVERALL PERFORMANCE INDICATOR SCORE:		**60**
CONDITION NUMBER (if relevant):		**7**

PI 2.4.1 – Habitats outcome

PI 2.4.1		The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Commonly encountered habitat status**			
	Guidepost	The UoA is **unlikely** to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is **highly unlikely** to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is **evidence** that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
	Met?	Y	Y	N
	Justification	Habitats and the macrozoobenthos of Lake Peipus have been studied since the 1930s by both Russian and Estonian scientists. Timm et al. (1996) described the lake environment, and stated that the bottom relief is quite uniform: sandy muds with small chironomids (midge larvae) and oligochaetes (worms) prevail in the shallow coastal regions, while the deep central parts are dominated by mud with chironomids, oligochaetes and mermithidae (nematode worms); these two substrate types are assessed as commonly encountered habitats. Trapnets are placed into the Lake seasonally at the start of the year once the ice cover has dissipated, and are removed at the end of the year before the ice reforms. However, trapnet locations are used repeatedly from year to year, and impacts are spatially restricted to the posts that are driven in to the sediment, and the foot of the net lying on the ground. Gillnet locations are also used repeatedly, and setting occurs on a daily basis, but the gear is fished statically and are highly unlikely to result in serious or irreversible harm to habitats. Given the nature of the habitats and the fishing gears, the Lake Peipus Perch and Pike-perch Fishery clearly meets SG80 for this SI. However, while the habitats of the lake have been studied for many years, the Assessment Team was not able to identify any work that had considered the overall impact of fishing activities on Lake Peipus. In the absence of this type of evidence, SG100 is not met.		
b	**VME habitat status**			
	Guidepost	The UoA is **unlikely** to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is **highly unlikely** to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is **evidence** that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	Lake Peipus is a freshwater lake and VMEs are not present; this SI is not scored.		
c	**Minor habitat status**			
	Guidepost			There is **evidence** that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where

PI 2.4.1		**The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.**		
				there would be serious or irreversible harm.
	Met?			N
	Justification	Cobbles and rocks with bivalves (including *Dreissena polymorpha* – zebra mussel) and gastropods (snails) are locally present, mainly in the northern part at a depth of 2-7 m, are assessed as a minor habitat. Similar to SIa, the nature of the habitats and the fishing gears mean that the fishery is highly unlikely to reduce the structure and function of cobbles and rocks as a minor habitat. However, the Assessment Team was not able to identify any specific evidence in this regard, and so this SG100 level requirement is not met.		
References		Timm et al. 1996.		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				**N/A**

PI 2.4.2 – Habitats management strategy

PI 2.4.2		There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Management strategy in place**			
	Guidepost	There are **measures** in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a **partial strategy** in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a **strategy** in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
	Met?	Y	Y	N
	Justification	Sandy muds in the shallow coastal regions and mud in the deep central parts of the Lake are assessed as commonly encountered habitats (Timm et al. 1996). Sandy muds and muds of the lake bed are not particularly vulnerable, and the static gears used are employed at specific locations, with a period of rest at each end of the season when ice on the lake breaks up in the Spring and develops again in Autumn. Only small-mesh gillnets can be used for relatively short periods in inshore locations; large mesh gillnets and trapnets are required to be used further away from the coast, and no fishing is permitted within 500 m of any river mouth. The Lake Peipus Fisheries Strategy 2015-2023 (PKAK 2015) includes an objective to enhance collaboration between fishermen and scientists to improve knowledge of and to create or restore spawning grounds – this has funding of €225,000 set aside. Overall, this comprises a partial strategy that is expected to achieve the Habitats outcome 80 level of performance, so SG80 is met. A higher score would require a strategy to be in place, which would include specific consideration of habitat vulnerabilities and a habitat data collection and review process which is not currently undertaken.		
b	**Management strategy evaluation**			
	Guidepost	The measures are **considered likely** to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	There is some **objective basis for confidence** that the measures/partial strategy will work, based on **information directly about the UoA and/or habitats** involved.	**Testing** supports **high confidence** that the partial strategy/strategy will work, based on **information directly about the UoA and/or habitats** involved.
	Met?	Y	Y	N
	Justification	The known nature of the commonly encountered habitats of Lake Peipus (sandy mud and mud) provides some objective basis for confidence that the partial strategy (using gillnets and trapnets, restricting fishing in inshore areas and prohibiting fishing near to river mouths) will work, so meeting SG80. To the knowledge of the Assessment Team, no testing has been undertaken, however, so the fishery does not meet SG100 for this SI.		
c	**Management strategy implementation**			
	Guidepost		There is **some quantitative evidence** that the measures/partial strategy is being implemented successfully.	There is **clear quantitative evidence** that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
	Met?		Y	N

PI 2.4.2		**There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.**		
	Justification	Fishery regulations on lake Peipus are enforced at a relatively high level, and all vessels (other than rowing boats) are required to be equipped with a VMS. Lake Peipus is now considered a low risk fishery for enforcement (I. Kask, pers. comm.). It is therefore considered that there is some quantitative evidence that the partial strategy (using gillnets and trapnets, restricting fishing in inshore areas and prohibiting fishing near to river mouths) is being implemented successfully, so meeting SG80. To meet SG100, a clear habitat objective would be needed, and this does not appear to be in place.		
d	**Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs**			
	Guidepost	There is **qualitative evidence** that the UoA complies with its management requirements to protect VMEs.	There is **some quantitative evidence** that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.	There is **clear quantitative evidence** that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	Lake Peipus is a freshwater lake and VMEs are not present; this SI is not scored.		
References		PKAK 2015, Timm et al. 1996.		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				**N/A**

PI 2.4.3 – Habitats information

PI 2.4.3		Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Information quality**			
	Guidepost	The types and distribution of the main habitats are **broadly understood**. OR **If CSA is used to score PI 2.4.1 for the UoA:** Qualitative information is adequate to estimate the types and distribution of the main habitats.	The nature, distribution and **vulnerability** of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA. OR **If CSA is used to score PI 2.4.1 for the UoA:** Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.	The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.
	Met?	Y	Y	Y
	Justification	As noted in PI 2.4.1, the habitats and macrozoobenthos of Lake Peipus have been studied since the 1930s by both Russian and Estonian scientists. Timm et al. (1996) described the lake environment, and stated that the bottom relief is quite uniform: sandy muds prevail in the shallow coastal regions, while the deep central parts are dominated by mud; cobbles and rocks are locally present, mainly in the northern part at a depth of 2-7 m, while aquatic macrophytes cover at least 1.7% of the whole area, but are increasing, especially in the south and along the shoreline. Overall, it is apparent that the distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats – SG100 is met.		
b	**Information adequacy for assessment of impacts**			
	Guidepost	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear. OR **If CSA is used to score PI 2.4.1 for the UoA:** Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear. OR **If CSA is used to score PI 2.4.1 for the UoA:** Some quantitative information is available and is adequate to estimate the consequence and spatial	The physical impacts of the gear on all habitats have been quantified fully.

PI 2.4.3		**Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat.**		
			attributes of the main habitats.	
	Met?	Y	Y	N
	Justification	The impact of static gears on sensitive epibenthic species and benthic habitats generally has been studied (e.g., Eno et al. 2001, Jennings & Kaiser 1998, Shester & Micheli 2011), but the impact on sandy muds and muds has not received particular attention because of the extremely limited potential for adverse impacts. All vessels in the fishery (other than rowing boats) are now are required to be fitted with VMS, allowing for accurate and reliable information on the timing and use of gears to be determined. Information is certainly adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear, so meeting SG80. The physical impacts of the gear on habitats has not been quantified, however, so SG100 is not met.		
c	**Monitoring**			
	Guidepost		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in habitat distributions over time are measured.
	Met?		Y	N
	Justification	All vessels in the fishery (other than rowing boats) are now are required to be fitted with VMS, such that adequate information continues to be collected to detect any increase in risk to the main habitats; SG80 is met. Habitats of Lake Peipus have been studied since the 1930s (Timm et al. 1996). Changes in habitat distribution over time have been estimated through comparing studies conducted in different periods, and relevant habitats are naturally contained to the lake area, but it is not clear that, in recent years at least, changes have been 'measured'. As such, the fishery does not meet SG100, here.		
References		Eno et al. 2001, Jennings & Kaiser 1998, Shester & Micheli 2011, Timm et al. 1996.		
OVERALL PERFORMANCE INDICATOR SCORE:				**85**
CONDITION NUMBER (if relevant):				**N/A**

PI 2.5.1 – Ecosystem outcome

PI 2.5.1		The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Ecosystem status**			
	Guidepost	The UoA is **unlikely** to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is **highly unlikely** to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is **evidence** that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	Y	Y	Y
	Justification	The ecosystem of the Lake Peipus Perch and Pike-perch Fishery is considered to be Lake Peipus and its drainage. The key ecosystem elements (SA3.16.3, MSC 2014) are then defined as water chemistry (eutrophication), and fish community structure and function. Stålnacke et al. (2005) identified four major perceived transboundary problems related to ecosystem management of Lake Peipus; they determined that eutrophication (including riverine loads) was the main water related environmental issue of concern." Kangur et al. (2013) investigated long-term changes in the fish community of Lake Peipus,and noted that "*anthropogenic eutrophication remains the most serious environmental problem for Lake Peipsi, triggering changes in the entire ecosystem.*" However, the UoA is not responsible for or implicated in eutrophication, and so the Lake Peipus Perch and pike-perch Fishery meets SG100 for this first element. Nõges & Nõges (2006) undertook an evaluation of Lake Peipsi against the Water Framework Directive lake quality criteria, noting that the fish community was considered to have a quality status of 'good', with "*no major changes in species composition* [and with] *abundance and age structure of commercial fishes* [that] *are intensively managed by fisheries*". This is supported by Bobyrev et al. (2013) who undertook an ADAPT-virtual population analysis of eight commercial fish populations within the lake, and determined that "*The causes of the observed population changes are related mainly to ecosystemic transformations taking place in the water body; only with respect to two species—perch and roach—can one state that the decrease in stocks is determined in part by the fishery impact*." Overall, for both key ecosystem elements, there is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm; SG100 is met.		
References		Bobyrev et al. 2013, Kangur et al. 2013, MSC 2014, Nõges & Nõges 2006, Stålnacke et al. 2005.		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				**N/A**

PI 2.5.2 – Ecosystem management strategy

PI 2.5.2		There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Management strategy in place**			
	Guidepost	There are **measures** in place, if necessary which take into account the **potential impacts** of the fishery on key elements of the ecosystem.	There is a **partial strategy** in place, if necessary, which takes into account **available information and is expected to restrain impacts** of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a **strategy** that consists of a **plan**, in place which contains measures to **address all main impacts of the UoA** on the ecosystem, and at least some of these measures are in place.
	Met?	Y	Y	Y
	Justification	The ecosystem of the Lake Peipus Perch and Pike-perch Fishery is considered to be Lake Peipus and its drainage, and the key ecosystem elements (SA3.16.3, MSC 2014) are defined as water chemistry (eutrophication), and fish community structure and function. The UoA is not responsible for or implicated in eutrophication, and so a strategy is not necessary to restrain impacts on this element. With respect to fish community structure and function, the Estonian Fisheries Strategy (2014 – 2020) explicitly mentions an ecosystem approach to fisheries management in Estonia. The MoE also states that "*The strategic goal of fisheries is to guarantee the good condition of fish populations and the diversity of fish species*". The strategy is operationalised through relatively intensive management of the Lake Peipus fishery, as described below, with the objective of maintaining healthy status of different stocks within the fishery. Annual fishery-independent surveys and assessments of stock status are undertaken to inform the management process (e.g., EMI 2017). Quotas are set to maintain fishing mortality at acceptable levels, mesh sizes of different gears are set to minimize the risk of capturing small/undersize individuals, and consideration is given to closing fishing operations at times or locations when species are particularly vulnerable to capture (e.g., no fishing is permitted within 500 m of river mouths entering the lake). All vessels (except rowing boats) are fitted with VMS, enforcement is undertaken at a high level (approximately 11% of fishing trips are monitored either on the lake or at landing; I. Kask, pers. comm.) and quotas are very closely monitored, with landing records being submitted daily and quota uptake monitored in near real-time (L. Naks, pers. comm.). The annual quota is divided in to two six-month periods, and directed fishing for each species ceases when the quota uptake is around 90%, allowing for the remainder to be taken as bycatch while directing for other species. Overall, these elements together comprise a strategy that consists of a plan, which is in place and contains measures to address all main impacts of the UoA on the ecosystem; SG100 is met.		
b	**Management strategy evaluation**			
	Guidepost	The **measures** are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).	There is **some objective basis for confidence** that the measures/partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved	**Testing** supports **high confidence** that the partial strategy/strategy will work, based on information directly about the UoA and/or ecosystem involved

PI 2.5.2		There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.		
	Met?	Y	Y	Y
	Justification	The UoA is not responsible for or implicated in eutrophication, and so a strategy is not necessary to restrain impacts on this element. Testing of the strategy for managing fish community structure and function has occurred through the successful functioning of the fishery over time. In addition, reviews of the status of the Lake Peipus fish community by Nõges & Nõges (2006) and Bobyrev et al. (2013) have shown that the impacts of the fishery have not resulted in significant changes to ecosystem structure and function. At the scale and intensity of the fishery, these reviews are considered to comprise testing that supports high confidence that the strategy will work, and are based on information directly about the UoA and the ecosystem involved. SG100 is met.		
c	**Management strategy implementation**			
	Guidepost		There is **some evidence** that the measures/partial strategy is being **implemented successfully**.	There is **clear evidence** that the partial strategy/strategy is being **implemented successfully and is achieving its objective as set out in scoring issue (a)**.
	Met?		Y	Y
	Justification	The UoA is not responsible for or implicated in eutrophication, and so a strategy is not necessary to restrain impacts on this element. The fishery management strategy in Lake Peipus is comprehensive, and enforcement is undertaken at a relatively high level. The clear evidence that the strategy is being implemented successfully and is achieving its objective comes from the status of the different commercial stocks within the Lake, which are generally considered to be good of very good (EMI 2017). Stocks of the cold, clean water species (burbot, vendace and Peipsi whitefish) are not in good condition, but have been affected by reduced ice cover and warmer waters rather than because of fishing pressure. The objective of maintaining healthy status of different stocks within the fishery is being achieved. Overall, the fishery meets SG100 here, also.		
References		Bobyrev et al. 2013, EMI 2017, MSC 2014, Nõges & Nõges 2006.		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				**N/A**

PI 2.5.3 – Ecosystem information

PI 2.5.3		There is adequate knowledge of the impacts of the UoA on the ecosystem.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Information quality**			
	Guidepost	Information is adequate to **identify** the key elements of the ecosystem.	Information is adequate to **broadly understand** the key elements of the ecosystem.	
	Met?	Y	Y	
	Justification	The ecosystem of the Lake Peipus Perch and Pike-perch Fishery is considered to be Lake Peipus and its drainage, and the key ecosystem elements (SA3.16.3, MSC 2014) are defined as water chemistry (eutrophication), and fish community structure and function. Water chemistry and the process and results of eutrophication on Lake Peipus are well studied and documented (e.g., Stålnacke et al. 2005, Nõges & Nõges 2006). Information is adequate to broadly understand this key element, meeting SG80. The fish community of Lake Peipus, including the interactions between the different species, is well studied (e.g., Bobyrev et al. 2013, EMI 2017, Kangur et al. 2013). Information is certainly adequate to confirm that this key element is broadly understood, so SG80 is also met for this key element.		
b	**Investigation of UoA impacts**			
	Guidepost	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but **have not been investigated** in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and **some have been investigated in detail**.	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and **have been investigated in detail**.
	Met?	Y	Y	Y
	Justification	The UoA is not responsible for or implicated in eutrophication, and the Lake Peipus Perch and Pike-perch Fishery meets SG100 for this element by default. With respect to fish community structure and function, as noted for PI 2.1.2, management of the Lake Peipus fishery is relatively intensive, with the objective of maintaining healthy status of different stocks within the fishery. A number of reviews have been undertaken to determine the impact or relative impact of the fishery on the fish stocks, including Bobyrev et al. 2013, Kangur et al. 2013, Nõges & Nõges 2006, and Stålnacke et al. 2005, and these have all determined that the fishery is not the main driver of change in the fish community; SG100 is met.		
c	**Understanding of component functions**			
	Guidepost		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are **known**.	The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are **understood**.
	Met?		Y	Y
	Justification	The impact of the UoAs on the P1 target species, primary, secondary and ETP species and Habitats are identified, as has been described throughout the rest of this report. The main functions of the P1 target species, primary and secondary species as predators and prey species within the lake are also well understood, while asp and wels catfish as ETP species comprise extremely minor components of the ecosystem. The importance of		

PI 2.5.3		There is adequate knowledge of the impacts of the UoA on the ecosystem.		
		different habitats within Lake Peipus and inflowing rivers for spawning and migration of different fish species is also well understood. Overall, the Lake Peipus fishery clearly meets SG80, and given the scale and intensity of the fishery and the relative quantity of information available, it is also considered that SG100 is met.		
d	**Information relevance**			
	Guidepost		Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components **and elements** to allow the main consequences for the ecosystem to be inferred.
	Met?		Y	Y
	Justification	As an important freshwater fishery that sits on the border between Estonia and Russia, Lake Peipus and the Lake Peipus fishery have been well studied for many decades. Knowledge gained through time, as well as through various reviews of the impact and relative impact of the fishery on the lake ecosystem, including those detailed in SIb, above, mean that adequate information is available on the impacts of the UoA on the components and elements to allow the main consequences for the ecosystem to be inferred; SG100 is met.		
e	**Monitoring**			
	Guidepost		Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.
	Met?		Y	Y
	Justification	The UoA is not responsible for or implicated in eutrophication, and the Lake Peipus Perch and Pike-perch Fishery meets SG100 for this element by default. With respect to fish community structure and function, there is a high level of scientific and management scrutiny on the fishery and its impacts on the fish community. There is no question that adequate data do continue to be collected to detect any increase in risk level, so SG80 is met. Annual fishery-independent surveys are conducted to determine stock status of the commercial species, while data on fishing activity (i.e., VMS) and catches (daily logbooks) are collected routinely. Knowledge of habitats and spawning locations is also good. It is considered that such information is adequate to support the development of strategies to manage ecosystem impacts, so SG100 is also met.		
References		Bobyrev et al. 2013, EMI 2017, Kangur et al. 2013, MSC 2014, Nõges & Nõges 2006, Stålnacke et al. 2005.		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				**N/A**

Principle 3 scoring tables

PI 3.1.1 – Legal and/or customary framework

PI 3.1.1		The management system exists within an appropriate legal and/or customary framework which ensures that it: • **Is capable of delivering sustainability in the UoA(s); and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Compatibility of laws or standards with effective management**			
	Guidepost	There is an effective national legal system **and a framework for cooperation** with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and **organised and effective cooperation** with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and **binding procedures governing cooperation with other parties** which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	Y	Y	Y
	Justification	Both Estonia and Russia have well-developed legal systems related to fisheries management. The Estonian Fishing Act was fully revised in 2015 and the Federal Fisheries Act on Fisheries and Conservation of Aquatic Biological Resources (Russia) was updated in 2014, so both are recent and relevant. At the transboundary level, the 1995 agreement for the formation of the ERFC (the Agreement between the Government of the Russian Federation and the Government of the Republic of Estonia on Cooperation in the Conservation and Utilization of Fish Stocks in the Lake Peipsi, Lämmijärv and Pskov Lakes) still hold and it is the basis for an annual, legally-binding protocol on joint fisheries management in the lake. In terms of P2, the Estonian and Russian governments signed an 'Agreement on the Protection and Sustainable Use of Transboundary Water Bodies' in 1997. An intergovernmental commission was established to co-ordinate the implementation of this agreement. The remit of the Joint Commission covers environmental monitoring, scientific research and coordination of relevant agencies and activities in Estonia and Russia. Given that the outputs of both the ERFC and the Joint Commission of the transboundary water body agreement are binding, this PI meets SG100.		
b	**Resolution of disputes**			
	Guidepost	The management system incorporates or is subject by law to a **mechanism** for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a **transparent mechanism** for the resolution of legal disputes which is **considered to be effective** in dealing with most issues and that is appropriate to the context of the UoA.	The management system incorporates or is subject by law to a **transparent mechanism** for the resolution of legal disputes that is appropriate to the context of the fishery and has been **tested and proven to be effective**.
	Met?	Y	Y	Y

PI 3.1.1		**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainability in the UoA(s); and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**		
	Justification	Any issue relating to fisheries allocations (e.g., TAC / permits) and conservation (e.g., fisheries rules) can be taken to a court of law. This is a transparent civil law system that accepts compulsory International Court of Justice (ICJ) jurisdiction with reservations. Estonia has a supreme Court and subordinate courts (circuit (appellate) courts; administrative, county, city, and specialized courts). Estonia has one of the highest disposition times in the EU at 146 days (this is the number of unresolved cases divided by the number of resolved cases at the end of a year multiplied by 365 days) and has a high clearance rate at 91% (e.g., the length of proceedings is linked to the rate at which cases are resolved by the courts. When the rate is about 100% it means that judicial systems are able to resolve at least as many cases as come in). Between 2010 and 2013, infringement procedures on average took 23 days (Beke *et al*, 2013). This suggests that the legal system is well tested and proven to be effective. Given that the legal system is transparent, appropriate to the context of the UoA, and is well tested and proven to be effective, this SI meets SG100.		
c	**Respect for rights**			
	Guide post	The management system has a mechanism to **generally respect** the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to **observe** the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to **formally commit** to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	Met?	Y	Y	Y
	Justification	The Ministry of Environment states that (i) the definitions, rights and obligations of commercial fishermen and recreational fishermen have been structured according to the national legislation and that (ii) traditional fishing opportunities have been consolidated and enlarged for Estonian fishermen" (MoE, 2016). The Fishing Act 2015 is explicit on the provision of both commercial and recreational fishing rights and opportunities, and how they are governed. Fishing opportunities (e.g., in the form of gear-specific permits) are allocated according to historical rights. These are handed down through families or can be sold on the open market. As such, there is a system to observe the legal rights and these are generally consistent with P1 (e.g., number of gear units permitted) and P2 (e.g., specific gears, with the related conservation-orientated fishing rules). This system is formally embedded into the permitting system and thus meets the intent of SG100.		
References		Beke *et al*, 2014, MoE (http://www.envir.ee/en/fisheries accessed on 20 Oct. 2016)		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				**N/A**

PI 3.1.2 – Consultation, roles and responsibilities

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties		
Scoring Issue		SG 60	SG 80	SG 100
a	**Roles and responsibilities**			
	Guide-post	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **generally understood**.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **explicitly defined and well understood for key areas** of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **explicitly defined and well understood for all areas** of responsibility and interaction.
	Met?	Y	Y	N
	Justification	The roles of the Ministry of Rural Affairs, the Ministry of Environment, other government (e.g., EEI, Environment Board, Police and Border Guard Board) and private sector (e.g., fishing companies and associations) are explicitly defined in government institutional mandates and other agreements (there is also an agreement between the government and fisheries associations on roles and coordination mechanisms (MoE 2010). The role and procedures of the trans-boundary ERFC are also clearly stated in the 1994 agreement. It is therefore considered the management process is well embedded in a national and trans-boundary institutional framework. Their functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction, and this therefore meets SG80. However it is not possible to state that they are explicitly defined and well understood for <u>all</u> areas, so fails to meet SG100.		
b	**Consultation processes**			
	Guidepost	The management system includes consultation processes that **obtain relevant information** from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that **regularly seek and accept** relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that **regularly seek and accept** relevant information, including local knowledge. The management system demonstrates consideration of the information and **explains how it is used or not used**.
	Met?	Y	Y	N
	Justification	Consultation takes place at two levels: <u>National level</u>: the Estonian Fisheries Council provides a forum for government (research, management and control) and private sector to discuss and agree management system needs and changes in advance of the annual ERFC meetings. This is open to all, and is regularly attended by the various fishing associations with interests on Lake Peipus. The high level of association membership (>95% gear use is included in membership) suggests that there is opportunity and encouragement for involvement by all, including local interests. <u>Trans-boundary</u>: The ERFC meets at least annually, and has further remote consultations		

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties		
		over the rest of the year. At their formal meeting in November of each year, delegates representing governance, management, research and fishers convene over a five day period. The Fisheries Council is supposed to meet four times a year, and whilst this does not always happen, it meets formally at least once a year. The Estonian, and then the Russian positions are then agreed at the ERFC meeting and published in a binding protocol, so this meets SG80. However, whilst the decisions are published in the form of a protocol, there is not necessarily an open consideration of the information and an explanation on how it is used or not used, and thus this fails to meet SG100.		
c	**Participation**			
	Guidepost		The consultation process **provides opportunity** for all interested and affected parties to be involved.	The consultation process provides **opportunity and encouragement** for all interested and affected parties to be involved, and **facilitates** their effective engagement.
	Met?		Y	N
	Justification	The Fisheries Council allows all participants to contribute to the ERFC annual management decision-making. The high level of association membership (>95% gear use is included in membership) suggests that there is opportunity and encouragement for involvement by all. There is also some degree of coordination between the ERFC and the Transboundary Water Commission over fisheries and related environmental matters. The Fisheries Council system (e.g. formal meetings with advance notice / agendas), and its feed into the ERFC process suggests that decision making is facilitated to some extent, so meets SG80. However, not all materials are provided in advance of the Fisheries Council meetings, and there are no formal, public outputs, so this fails to meet SG100.		
References		MoE 2010, Margit Sare – PTSC, pers. coomm., 19 October 2016		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				**N/A**

PI 3.1.3 – Long term objectives

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Objectives**			
	Guidepost	Long-term objectives to guide decision-making, consistent with the MSC fisheries standard and the precautionary approach, are **implicit** within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach are **explicit** within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach, are **explicit** within **and required by** management policy.
	Met?	Y	N	N
	Justification	The EU CFP does not apply to inland fisheries, so this is covered by national (Estonian / Russian) strategic objectives and management policy, as well as the agreement that underpins the ERFC. The Estonian Fisheries Strategy (2014 – 2020) explicitly mentions an ecosystem approach to fisheries management in Estonia. The MoE also states that "*The strategic goal of fisheries is to guarantee the good condition of fish populations and the diversity of fish species*" and goes on to say "*It is vital to avoid the negative effect fishing has on the ecosystem. Fish populations are considered to be in good condition when fish resources can reproduce themselves naturally in the existing environmental conditions and when the species have a characteristic age structure despite the pressure of commercial fishing*" (MoE 2016). The stated purpose of the recently revised Fish Act (2015) is to (i) ensure conservation and economic use of fish and aquatic plant resources on the basis of internationally recognized principles of responsible fisheries; (ii) ensure reproduction capacity of fish and aquatic plant resources and productivity of bodies of water; and (iii) avoid undesirable changes in the ecosystem of bodies of water. The Estonia Fisheries Strategy (2014 – 2020) and the Fish Act (2015) both provide long-term objectives for decision-making that is consistent with MSC fisheries standard. The use of annually-evaluated TACs, allied with a comprehensive control system (both unusually for an inland lake) suggests that a precautionary approach is implicit in the management system, and thus meets SG 60. However the ecosystem approach is not necessarily precautionary, and thus SG 80 is not met. As a result a Condition of Certification (#8) has been imposed to resolve this.		
References		MoE 2016 (http://www.envir.ee/en/fisheries) accessed on 21 Oct 2016).		
OVERALL PERFORMANCE INDICATOR SCORE:				**60**
CONDITION NUMBER (if relevant):				**8**

PI 3.2.1 – Fishery-specific objectives

PI 3.2.1		The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Objectives**			
	Guidepost	**Objectives**, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are **implicit** within the fishery-specific management system.	**Short and long-term objectives**, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are **explicit** within the fishery-specific management system.	**Well defined and measurable short and long-term objectives**, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery-specific management system.
	Met?	Y	Y	Partial
	Justification	Fisheries management in Lake Peipus is driven by the transboundary ERFC. The ERFC agreement (1994) includes an over-arching objective of "*recognizing its shared responsibility for conservation of Lakes Chudskoe (Peipsi), and Pskov Lakes on the basis of mutual interest in the rational use of fish resources in these lakes, intending to join efforts for the conservation, rational use and management of fisheries resources*" (English translation from the original Russian). This suggests that a long-term objective for both P1 (the fisheries resources) and P2 (conservation) are both explicit, thus meeting SG80. The annual protocols by the ERFC also include short-term objectives in terms of fishing effort (e.g., number of fishing permits to be used) and fishing mortality (via the annual TACs) (e.g., ERFC 2015, ERFC 2016). Whilst the short-term objectives are measurable and indeed annually reviewed, the long-term objective is not, so SG100 is only partially met.		
References		ERFC 2015, ERFC 2016, ERFC Agreement 1994.		
OVERALL PERFORMANCE INDICATOR SCORE:				**90**
CONDITION NUMBER (if relevant):				**N/A**

PI 3.2.2 – Decision-making processes

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Decision-making processes**			
	Guidepost	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are **established** decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	Y	Y	
	Justification	The annual meeting of the ERFC is the main decision-making process for fisheries management in Lake Peipus. Formed in 1994, it provides a forum for Estonian and Russian managers to discuss and agree fisheries output controls in the form of total allowable catches (TACs), input control in the form of a number of allowable fishing gear units and the setting of fisheries technical measures applicable to the lake. This is an annual process, with a formal protocol being issued in December and the revised management regime starting in the following January. The process is highly inclusive on the Estonian side, with the Ministry of Environment and Ministry of Rural Affairs and fisheries associations both working within a Fisheries Council that formulates the Estonian position on stocks and their management needs. There is a similar process on the Russian side with the FFA and GosNIORH, followed by a review by the State Ecological Expertise. This is well-established decision-making process that is designed to provide annually updated measures (e.g. fisheries regulations) and strategies e.g. development and implementation of harvest strategies such as TACs and gear effort restrictions. This therefore meets SG80.		
b	**Responsiveness of decision-making processes**			
	Guide-post	Decision-making processes respond to **serious issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to **serious and other important issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to **all issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	Y	Y	N
	Justification	The national and ERFC processes respond to serious and other important issues (e.g., reduction of Danish seine effort, as well as some social issues) at least on an annual basis. There is also further bilateral contact over the year, including formal discussion on the implementation progress of the annual ERFC protocol. This allows all serious and other important issues to be identified in a timely, transparent and adaptive manner, thus meeting SG 80. However it cannot be said that it responds to <u>all</u> issues (and their wider implications), so fails to meet SG 100.		
c	**Use of precautionary approach**			
	Guidepost		Decision-making processes use the precautionary approach and are based on best available information.	

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.		
	Met?		Y	
	Justification	Whilst not explicitly precautionary, decision-making over the last two decades - both at national and transboundary levels - has been implicitly precautionary. Evidence includes: 1. TACs set at F_{MSY} and tend to reflect the overall productivity of the lake e.g., prey (smelt) levels. 2. Fishing mortality (F) is set at 0.2 to 0.25 which is intended to allow for non-commercial catches and unaccounted mortality (e.g., from discarding or IUU fishing). 3. Estonian catches against quotas are collated daily, and thus provides best available information on fishing mortality. These together suggest an overall precautionary approach, so the fishery meets this SG80 requirement.		
d	**Accountability and transparency of management system and decision-making process**			
	Guidepost	Some information on the fishery's performance and management action is generally available on request to stakeholders.	**Information on the fishery's performance and management action is available on request**, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders **provides comprehensive information on the fishery's performance and management actions** and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	Y	Y	N
	Justification	The national preparation for the annual ERFC meeting via the Fisheries Council and the final ERFC Protocol, provide information on the fishery's performance and management action. There is information available (via informal reports and proceedings) of national management actions and recommendations, and thus meets SG80. This is available upon request from the MoE. However – whilst there is an annual ERFC protocol published - there is no comprehensive formal reporting on how the management system responds to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity at national level, so the fishery fails to meet SG 100.		
e	**Approach to disputes**			
	Guidepost	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.		
	Met?	Y	Y	N
	Justification	The Government was taken to court over a fisheries issue once in early 1990s (the Chief Fishery Inspector allowed a Danish seine fishery to occur during a ban) but this has not occurred since. The management authority works in tight cooperation with user-groups at the regulatory level (e.g. through the MoE / fisheries associations joint stewardship agreement), ensuring as high legitimacy as possible for regulations and other management decisions, and so meets SG80. Only the most serious cases go to prosecution by the EEI and PBGB and possible transfer to the court system. However, there is no evidence that the management system or fishery acts proactively to avoid legal disputes, so fails to meet SG100.		
References				
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				**N/A**

PI 3.2.3 – Compliance and enforcement

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
Scoring Issue		SG 60	SG 80	SG 100
a	**MCS implementation**			
	Guidepost	Monitoring, control and surveillance **mechanisms** exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance **system** has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A **comprehensive** monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
	Met?	Y	Y	Y
	Justification	Monitoring, Control and Enforcement (MCS) is undertaken both on a national basis and through bilateral management under the ERFC. As a national level the Estonian Environmental Inspectorate (EEI) is responsible for both planning and implementing MCS. The EEI produces an annual work plan, with specific activities and targets set for each of the four county offices. This covers vessel authorisation (inspected on the lake and at port), fishermen's fishing authorisations, landings authorisation, recreational fishing rights, fish sellers and markets, recreational fishing rights and inspections over open and closed seasons. The MCS plan normally includes at least three major surveys, with specialist sub-plans focusing on critical issues such as protecting spawning periods, for both perch and pike perch. The overall target is that 5% of fishing trips are inspected on the lake, and at least 3% of landings are also inspected. In 2015, 488 inspections were carried out on the water and a further 658 on land (see table overleaf). This is out of around 11,000 fishing trips (Ivo Kask, pers. comm., 20 October 2016), suggesting an overall inspection rate (of fishing and landings activities) of around 11%. This being a transboundary lake, the EEI work closely with the Police and Border Guard Board (PBGB). Both EEI and PBGB officers are fully gazetted enforcement officers. All EEI officers undertake a six month training course on the fisheries regulations, inspection processes and procedures and arrest protocols. They then undergo examinations before being fully gazetted. Officers can stop fishing, arrest fishermen, seize vessels and gear, and confiscate the catch where appropriate. The PBGB officers are mainly tasked with cross-border surveillance, but will report illegal fisheries activities to the EEI when seen. The EEI have four large (c. 8m) patrol vessels, four smaller rigid inflatable boats (RIBs) of 5-6 m, snowmobiles and patrol vehicles. The large vessels are equipped with net haulers and equipment to assist the seizing of large gear. Officers may be armed, but Lake Peipus is considered a low risk area. In Russia enforcement of fishery laws is under the responsibility of a separate service, the Federal Security Service (FSB), working with the Pskov Oblast. The Ministry of Agriculture also coordinates the work of the Federal Service of Veterinary and Sanitary Inspection (RosSelkhozNadzor), which is responsible for quality/health inspections of landed fish products before they are moved into domestic or export markets. There are no formal joint patrols or operations between Estonia and Russia, but each side can observer activities as part of the ERFC agreements. Estonian fishers are not allowed to fish in Russian waters, and vice versa. All vessels are equipped with a vessel monitoring system (VMS) and any attempt to fish across the border would be detected and acted upon immediately. There are regular cross-border reviews of VMS data, and the ERFC will		

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
		review enforcement activities and effectiveness on an annual basis. Given the extensive use of VMS (on all commercial vessels, except rowing boats), the high level of inspection (11% of all fishing trips / landings combined), the relatively limited number of criminal cases pursued and the recent decline in administrative penalties attributed to the recent introduction of VMS across all gears, this meets SG80. When combined with the extensive surveillance on the lake due to its transboundary nature, and the relatively small scale and intensity of the fishery, it is considered this meets SG 100.		
b	**Sanctions**			
	Guidepost	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, **are consistently applied** and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and **demonstrably** provide effective deterrence.
	Met?	Y	Y	N
	Justification	Both administrative and criminal sanctions can be applied to most infringements described in the Fisheries Act. For a private person the maximum penalty for a CFP infringement can reach up to EUR 1,200 and for a legal person up to EUR 3,200. In addition this, sanctions could also include a fee for the damage done to the environment, for example fish stocks. The penalties for infringements are assessed from the estimated impact of the illegal activity – catch values are estimated from a standard table (i.e., €xx per fish of each species), but if the damage is estimated to be >€4,000, then it will go to court. If less, then there would be an administrative penalty. Tickets are issued and are required to be paid within 15 days. The permanent confiscation of gear and catch can be ordered by a Court or an extra-judicial body under the provision of the Estonian Criminal Code (art. 83). Since 2010 there have been 543 administrative penalties levied against fishers on Lake Peipus (approx. 90 per year) and 14 criminal cases. Of the 14 criminal cases between 2010 and 2016, there was one conviction, two acquittals and one termination of the criminal proceeding by the court due to the negligible guilt and the lack of public interest. The rest of the cases are still ongoing. According to EEI officials (Ivo Kask, pers. comm., 20 October 2016), Lake Peipus is a relatively low risk location. The number of administrative penalties has diminished in the last two years since the introduction of VMS across the fleet. A combination of administrative and criminal sanctions therefore exist and EEI records show that they are consistently applied. Discussions with fishers and fishing associations suggest that they act as an effective deterrent, and that serious infringements are rare. This therefore meets SG80. Whilst the recent (2015 – 2016) trend in administrative penalties (since the wide scale introduction of VMS) is encouraging, the rising rate of administrative penalties given over 2011 – 2013 suggests that <u>demonstrably</u> effective deterrence is yet to be comprehensively demonstrated, so the fishery fails to reach SG100.		
c	**Compliance**			
	Guidepost	Fishers are **generally thought** to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	**Some evidence exists** to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a **high degree of confidence** that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	Y	Y	N

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
	Justification	As follows from 3.2.3 a) above, Lake Peipus has a robust system for physical inspection of fishing activity and landings that is proportionate to the size of the fishery. The EEI is able to produce detailed overviews of compliance levels in this lake fishery. It should also be stated that, due to its transboundary nature, this lake is highly surveilled areas, both by the PBGB and the Russian security services, with a reasonable degree of cross-border cooperation. This information suggests that there is some evidence that fishers comply with regulation, so meeting SG80. In addition to the robust sanctioning system (see 3.2.3 b), the social control that exists in a relatively small fishing community as on Lake Peipus, as well as the legitimacy of regulations due to the high degree of user-group involvement, are believed to contribute to the observed levels of compliance in the fishery. However there is insufficient evidence that there is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery, and thus it fails to meet SG100.		
d	Systematic non-compliance			
	Guidepost		There is no evidence of systematic non-compliance.	
	Met?		Y	
	Justification	According to both the EEI, fishers and fisheries associations, there is no evidence of systematic non-compliance in the fishery. The assessment team has not come across information indicating that this is not the case. Therefore, this SG80 requirement is met.		
References		Ivo Kask, pers. comm., 20 October 2016; Urmas Pirk, Union of Fishermen of Peipsi Basin, pers. comm., 19 Oct 2016; Liivika Naks, MoE, pers. comm., 19 Oct 2016; Andrey Ulukhaniyants, fisher, pers. comm., 18 Oct 2016; Margus Narusing, fisher, pers. comm., 19 Oct 2016.		
OVERALL PERFORMANCE INDICATOR SCORE:				**85**
CONDITION NUMBER (if relevant):				**N/A**

PI 3.2.4 – Monitoring and management performance evaluation

PI 3.2.4		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives. There is effective and timely review of the fishery-specific management system.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Evaluation coverage**			
	Guidepost	There are mechanisms in place to evaluate **some** parts of the fishery-specific management system.	There are mechanisms in place to evaluate **key** parts of the fishery-specific management system	There are mechanisms in place to evaluate **all** parts of the fishery-specific management system.
	Met?	Y	Y	N
	Justification	The Lake Peipus undergoes a detailed annual review through the auspices of the ERFC. This entails both countries monitoring catches, fishing effort and stock status indices in order to agree on revisions to TACs, technical measures and the next year's research and monitoring programme. This involves both a national position setting process and bilateral discussions and agreements. This is considered to cover all the key parts of the fisheries management system for Lake Peipus, and so meets SG80. However, whilst the ERFC process does cover environmental issues where key to the lakes productivity and function, it can to be said that the ERFC covers all parts of the fisheries-specific management system, and thus fails to reach SG100.		
b	**Internal and/or external review**			
	Guidepost	The fishery-specific management system is subject to **occasional internal** review.	The fishery-specific management system is subject to **regular internal** and **occasional external** review.	The fishery-specific management system is subject to **regular internal** and **external** review.
	Met?	Y	Y	N
	Justification	The Lake Peipus undergoes a detailed annual review through the auspices of the ERFC in order to revise the lakes' fisheries management systems where necessary. Whilst this is mostly internal e.g. via MoE and the FFA, there is a degree of external evaluation by the Fisheries Council in Estonia and the State Ecological Expertise in Russia. There have also been the occasional external evaluation by external scientists, such as that by Bobrev et al. (2013). Whilst this meets SG80, the external review insufficiently regular to meet SG100.		
References		Bobyrev *et al*. 2013		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				**N/A**

Appendix 2: RBF results

Please note: The PSA for Crucian carp was run for comparison and context, but the results were not used in the assessment as no stakeholder consultation was conducted during the site visit. The resulting PSA score for Crucian carp as a minor secondary species = 95 (low risk).

Table 34: PSA rationale table – Crucian carp (minor secondary species).

PI number	**2.2.1**	
A. Productivity		
Attribute	**Rationale**	**Score**
Average age at maturity.	2.0 years (http://www.fishbase.org/summary/270)	**1**
Average maximum age	8.5 years (http://www.fishbase.org/summary/270)	**1**
Fecundity	54,770 (mean) (http://www.fishbase.org/summary/270)	**1**
Average maximum size	42.1 cm (http://www.fishbase.org/summary/270)	**1**
Average size at maturity	36.1 cm (http://www.fishbase.org/summary/270)	**1**
Reproductive strategy	Demersal egg layer (http://www.fishbase.org/summary/270)	**2**
Trophic level	3.1 (http://www.fishbase.org/summary/270)	**2**
B. Susceptibility		
Fishery only where the scoring element is scored cumulatively		
Attribute	**Rationale**	**Score**
Areal Overlap	>30% overlap Species is present in the lake and probably inflowing rivers, but the fishery may occur in the lake area only.	**3**
Encounterability	High overlap Species is demersal and the gillnets and trap gear sits on or near to the bottom	**3**
Selectivity of gear type	Individuals <half the size of maturity can escape or avoid gear.	**2**
Post capture mortality	Retained species	**3**

Appendix 3: Conditions

Condition 1

UoA	1:
Target Species	**Perch**
Performance Indicator	**1.2.2:** Harvest control rules & tools
Scoring Issue	**SIb:** HCRs robustness to uncertainty
Score	**60**
Rationale	The management system accounts for some uncertainty when setting HCRs. For example, managers estimate the magnitude of mortality from recreational and IUU fishing, and include the estimates in the stock assessment and in the process of allocating the TAC and quotas. However there remain some uncertainties about how managers estimate actual values for recreational and IUU fishing, and for the level of mortality associated with discarding, particularly of juvenile perch. Perch is the subject of quite an intensive recreational fishery, and in some years the volume of the recreational fishery can be about half of the commercial fishery, especially if the ice conditions in winter are favourable for amateur fishing (Orru et al. 2014). Thus, it is not clear that the HCRs are likely to be robust to the main uncertainties (levels of mortality associated with non-commercial fisheries and discarding).
Condition	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SIb is met, specifically through demonstrating the following: SIb: "*The HCRs are likely to be robust to the main uncertainties*."
Milestones	<u>Please note: Milestones here are similar or the same as those for Condition 2.</u> <u>Year 1</u>: • Design a scientifically valid approach to determine the sources and amounts of perch mortality associated with recreational and IUU fishing in Lake Peipus (including of juvenile by-catch and discarding) that will aid in meeting the SG80 requirement for this SI. • Provide a description of the plan to the Audit Team. • Resulting score = 75. <u>Year 2</u>: • Implement the plan as designed in Year 1. • Update the Audit Team as to progress of implementation. • Resulting score = 75. <u>Years 3</u>: • Continue implementing the plan as designed in Year 1. • Update the Audit Team as to progress of implementation, and provide a summary of findings. • If necessary, the Client should meet fishery managers to review data and discuss

	possible changes to HCRs. • Resulting score = 75. Year 4: • Demonstrate that the SG80 requirement of SIb is met, such that the HCRs are likely to be robust to the main uncertainties. • Resulting score = 80
Client action plan	Year 1. The Client, in consultations with Estonian Fishery Inspectorate, Ministry of Environment, Ministry of Rural Affairs and Estonian Marine Institute, will develop a plan of survey aiming to describe patterns and magnitude of illegal fishing in Peipus Lake, including discards of juvenile perch. The latest question will be addressed in detail by the Estonian Marine Institute in the framework of a project "*Discarding and the survival of discard of Lake Peipsi commercial fisheries: impact assessment of different fishing gears and techniques*". Recreational fishing will be studied by Ministry of Rural Affairs with a support of European Maritime and Fisheries Fund (EMFF), which carries out regular surveys every two-three years in the entire Estonia including Lake Peipus: http://www.envir.ee/sites/default/files/harrastuskalapyyk_2012.pdf http://www.envir.ee/sites/default/files/harrastuskalastajate_uuring_2016_euk_logodega.pdf The Client will observe projects fulfilled by the Estonian Marine Institute and Ministry of Rural Affairs and keep the Certifier informed about the progress. Year 2. Collection of field data aimed to describe patterns and to estimate magnitude of illegal fishing (including discards of juveniles) in cold and warm seasons (in-depth interviews with stakeholders and fishers in fishing sites). Preliminary analyses of obtaining data and, based on that, modification of methodologies if needed. Observing above-mentioned projects. Year 3. Collection of field data aimed to describe patterns and to estimate magnitude of illegal fishing (including discards of juveniles) in cold and warm seasons (in-depth interviews with stakeholders and fishers in fishing sites). Consultations with the governmental agencies about methodologies and preliminary results. Observing above-mentioned projects. Year 4. Final analysis of data and preparation of the report about patterns of illegal fishing and quantitative analysis of magnitude of removals.
Consultation on condition	Letters of support for the Client Action Plan have been provided by the Estonian Ministry of Environment and the Estonian Marine Institute, University of Tartu (please see Appendix 4).

Condition 2

UoA	1
Target Species	**Perch**
Performance Indicator	**1.2.4:** There is an adequate assessment of the stock status

Scoring Issue	**SIc:** The assessment takes uncertainty into account.
Score	**75**
Rationale	The assessment identifies major sources of uncertainty. Estimation of the level of recreational fishing is based on questionnaires received from recreational fishers (responsibility of Ministry of Environment). Volumes of fish caught by recreational fishers are based on the number of fishermen on the Peipus Lake during winter and summer periods, the intensity of fishing, intensity of fishing of particular species of fish (targeting behaviour), and average time spent fishing during the winter and summer periods. The collected data are recorded in a so called "amateur fisher card". The level of IUU catch and discard mortality is accounted for by applying a correction factor to the fishing mortality estimate. The ultimate values of non-commercial and IUU removals and discard mortality are determined by expert review of fishery scientists of both countries at joint ERFC, but the methodology of their approximations is unclear. Essentially, it is clear that the assessment identifies major sources of uncertainty, but it is not apparent how this uncertainty is taken in to account.
Condition	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SIc is met, specifically through demonstrating the following: SIc: "*The assessment takes uncertainty into account.*"
Milestones	Please note: Milestones here are similar or the same as those for Condition 1. Year 1: • Design a scientifically valid approach to determine the sources and amounts of perch mortality associated with recreational and IUU fishing in Lake Peipus (including of juvenile by-catch and discarding) that will aid in meeting the SG80 requirement for this SI. • Provide a description of the plan to the Audit Team. • Resulting score = 75. Year 2: • Implement the plan as designed in Year 1. • Update the Audit Team as to progress of implementation. • Review the appropriateness of different methods to take account of uncertainty in the perch stock assessment. • Resulting score = 75. Years 3: • Continue implementing the plan as designed in Year 1. • Update the Audit Team as to progress of implementation, and provide a summary of findings. • If necessary, meet with fishery managers to review data, discuss uncertainties, and consider modifications to the stock assessment methods. • Resulting score = 75. Year 4: • Demonstrate that the SG80 requirement of SIc is met, such that the perch stock assessment takes uncertainty into account. • Resulting score = 80.

Client action plan	Year 1. The Client, in consultations with Estonian Fishery Inspectorate, Ministry of Environment, Ministry of Rural Affairs and Estonian Marine Institute, develops a plan of survey aiming to describe of patterns and magnitude of recreational and illegal fishing of perch in Peipus Lake, including discarding of juvenile perch. The latest question will be addressed in detail by the Estonian Marine Institute in the framework of a project "*Discarding and the survival of discard of lake Peipsi commercial fisheries: impact assessment of different fishing gears and techniques*". Recreational fishing will be studied by Ministry of Rural Affairs with a support of European Maritime and Fisheries Fund (EMFF), which carries out regular surveys every two-three years in the entire Estonia including Lake Peipus: http://www.envir.ee/sites/default/files/harrastuskalapyyk_2012.pdf http://www.envir.ee/sites/default/files/harrastuskalastajate_uuring_2016_euk_logodega.pdf The Client will observe projects fulfilled by the Estonian Marine Institute and Ministry of Rural Affairs and keep the Certifier informed about the progress. These projects are performed by governamental agencies to provide data which will be used in the stock assessment to reduce associated uncertanities. The Client will request about how obtained information is uised will keep the certifier informed about that. Year 2. Collection of field data aimed to describe patterns and to estimate magnitude of illegal perch fishing (including discards of juveniles) in cold and warm seasons (in-depth interviews with stakeholders and fishers in fishing sites) with particular attention to uncertainties of the estimates. Preliminary analyses of obtaining data and, based on that, modification of methodologies if needed. Continuous interacting with governmental agencies. Observing abovementioned projects, keeping the certifier informed about the progress. Year 3. Collection of field data aimed to describe patterns and to estimate magnitude of illegal perch fishing (including discards of juveniles) in cold and warm seasons (in-depth interviews with stakeholders and fishers in fishing sites). Consultations with the governmental agencies about methodologies and reviewing of preliminary results. Observing above-mentioned projects, keeping the certifier informed about the progress. Year 4. Final analysis of data and preparation of the report about patterns of recreational and illegal perch fishing and quantitative analysis of magnitude of removals with focus on analysis of uncertainties and how the collected information is used in the stock assessment.
Consultation on condition	Letters of support for the Client Action plan have been provided by the Estonian Ministry of Environment and the Estonian Marine Institute, University of Tartu (please see Appendix 4).

Condition 3

UoA	2
Target Species	**Pike-perch**
Performance Indicator	**1.2.1:** There is a robust and precautionary harvest strategy in place
Scoring Issue	**SIf:** Review of alternative measures

Score	75
Rationale	Whilst there is evidence that there are at least regular reviews of measures to minimise UoA-related mortality of unwanted catch of pike-perch, so that SG60 is met, the Assessment Team was made aware of a concern that there is an unknown level of pike-perch mortality occurring in the summer trapnet fishery, which has increased in intensity in recent 3-5 years (V. Vaino, pers. comm., site visit). The Assessment Team was also made aware that there is intent to investigate this issue and that funding was being sought for the work, but had yet to be obtained. However, in the absence of a review of this issue, and the introduction of measures as appropriate to minimise UoA-related mortality from this cause, it is not possible to confirm that the fishery meets SG80.
Condition	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SIc is met, specifically through demonstrating the following: SIf: "*There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate*."
Milestones	Please note: Milestones here are similar or the same as those for Condition 4 Year 1: • Design a scientifically valid approach to determine the sources and amounts of pike-perch mortality associated with discarding in the summer trapnet fishery that will aid in meeting the SG80 requirement for this SI. • Provide a description of the plan to the Audit Team. • Resulting score = 75. Year 2: • Implement the plan as designed in Year 1. • Update the Audit Team as to progress of implementation. • Resulting score = 75. Years 3: • Continue implementing the plan as designed in Year 1. • Update the Audit Team as to progress of implementation, and provide a summary of findings. • Develop and/or test options to minimise discard mortality in the fishery, as appropriate. • Resulting score = 75. Year 4: • Demonstrate that the SG80 requirement of SId is met, such that there is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate. • Resulting score = 80
Client action plan	Year 1. The issue on juvenile discards of pike-perch be fully addressed in the project of the Estonian Marine Institute entitled "*Discarding and the survival of discard of Lake Peipus commercial fisheries: impact assessment of different fishing gears and techniques*". The Client will observe

	about the progress of the project and will inform the certifier about it. The Client will discuss the design of the project and utilisation of its results with a focus on alternative ways to reduce of bycatch of juvenile pike-perch with Estonian Marine Institute and will inform about this the certifier. Year 2. The Client observes a progress of a project of the Estonian Marine Institute entitled "Discarding and the survival of discard of Lake Peipsi commercial fisheries: impact assessment of different fishing gears and techniques" discussuss obtained results and different ways of reducing pike-perch juvenile bycatch with the Estonian Marine Institute and keep the certifier informed about this. Year 3. Collecting of field information in the frame of the project on discarding and the survival of discard of Lake Peipus commercial fisheries: impact assessment of different fishing gears. Informing the certifier about the progress of the project. The Client discusses obtained results and different ways of reducing pike-perch juvenile bycatch with the Estonian Marine Institute and keep the certifier informed about this. Year 4. Collecting of field information in the frame of the project on discarding and the survival of discard of Lake Peipsi commercial fisheries: impact assessment of different fishing gears. Informing the certifier about the progress of the project. Feasible options to minimise discarding that are identified in Year 3 are implemented as appropriate. The Client prepares a final report for certifier about results of the project.
Consultation on condition	Letters of support for the Client Action plan have been provided by the Estonian Ministry of Environment and the Estonian Marine Institute, University of Tartu (please see Appendix 4).

Condition 4

UoA	2
Target Species	**Pike-perch**
Performance Indicator	**1.2.4:** There is an adequate assessment of the stock status
Scoring Issue	**SIc:** The assessment takes uncertainty into account.
Score	**75**
Rationale	The assessment identifies major sources of uncertainty. The level of non-commercial and IUU catch and discard mortality is accounted for by applying a correction factor to the fishing mortality estimate. The ultimate values of non-commercial and IUU removals and discard mortality are determined by expert review of fishery scientists of both countries at joint ERFC, but the methodology of their approximations is unclear. Essentially, it is clear that the assessment identifies major sources of uncertainty, but it is not apparent how this uncertainty is taken in to account.
Condition	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SIc is met, specifically through demonstrating the following:

	SIc: "*The assessment takes uncertainty into account.*"
Milestones	Please note: Milestones here are similar or the same as those for Condition 3 Year 1: • Design a scientifically valid approach to determine the sources and amounts of pike-perch mortality associated with recreational and IUU fishing in Lake Peipus (including of juvenile by-catch and discarding) in the summer trapnet fishery that will aid in meeting the SG80 requirement for this SI. • Provide a description of the plan to the Audit Team. • Resulting score = 75. Year 2: • Implement the plan as designed in Year 1. • Update the Audit Team as to progress of implementation. • Consider the appropriateness of different methods to take account of uncertainty in the pike-perch stock assessment. • Resulting score = 75. Years 3: • Continue implementing the plan as designed in Year 1. • Update the Audit Team as to progress of implementation, and provide a summary of findings. • If necessary, meet with fishery managers to review data, discuss uncertainties, and consider modifications to the pike-perch stock assessment methods. • Resulting score = 75. Year 4: • Demonstrate that the SG80 requirement of SIc is met, such that the pike-perch stock assessment takes uncertainty into account. Resulting score = 80
Client action plan	Year 1. The Client, in consultations with Estonian Fishery Inspectorate, Ministry of Environment, Ministry of Rural Affairs and Estonian Marine Institute, develops a plan of survey aiming to describe of patterns and magnitude of recreational and illegal fishing of pike-perch in Peipus Lake, including discarding of juvenile pike-perch. The latest question will be addressed in detail by the Estonian Marine Institute in the framework of a project "Discarding and the survival of discard of Lake Peipsi commercial fisheries: impact assessment of different fishing gears and techniques". Recreational fishing will be studied by Ministry of Rural Affairs with a support of European Maritime and Fisheries Fund (EMFF), which carries out regular surveys every two-three years in the entire Estonia including Lake Peipus: http://www.envir.ee/sites/default/files/harrastuskalapyyk_2012.pdf http://www.envir.ee/sites/default/files/harrastuskalastajate_uuring_2016_euk_logodega.pdf The Client will observe projects fulfilled by the Estonian Marine Institute and Ministry of Rural Affairs and keep the Certifier informed about the progress. These projects are performed by governamental agencies to provide data which will be used in the stock assessment to reduce associated uncertanities. The Client will request about how obtained information is uised will keep the certifier informed about that.

	Year 2. Collection of field data aimed to describe patterns and to estimate magnitude of illegal pike-perch fishing (including discards of juveniles) in cold and warm seasons (in-depth interviews with stakeholders and fishers in fishing sites) with particular attention to uncertainties of the estimates. Preliminary analyses of obtaining data and, based on that, modification of methodologies if needed. Continuous interacting with governmental agencies. Observing abovementioned projects, keeping the certifier informed about the progress. Year 3. Collection of field data aimed to describe patterns and to estimate magnitude of illegal pike-perch fishing (including discards of juveniles) in cold and warm seasons (in-depth interviews with stakeholders and fishers in fishing sites). Consultations with the governmental agencies about methodologies and reviewing of preliminary results. Observing abovementioned projects, keeping the certifier informed about the progress. Year 4. Final analysis of data and preparation of the report about patterns of recreational and illegal pike-perch fishing and quantitative analysis of magnitude of removals with focus on analysis of uncertainties and how the collected information is used in the stock assessment.
Consultation on condition	Letters of support for the Client Action plan have been provided by the Estonian Ministry of Environment and the Estonian Marine Institute, University of Tartu (please see Appendix 4).

Condition 5

UoA	1 and 2
Performance Indicator	**2.3.2:** ETP species management strategy
Scoring Issue	**SIb:** Management strategy in place (alternative) **SIc:** Management strategy evaluation
Score	**65**
Rationale	The Lake Peipus Perch and Pike-perch Fishery has a number of measures in place which are expected to ensure that the UoA does not hinder the recovery of asp and wels catfish as ETP species. However, it is not possible to say that there is a strategy in place, in particular because information on interactions is anecdotal, only (SIb). Further, in the in the absence of any data on captures and the condition of the fish upon release, it is not possible to say that there is an objective basis for confidence that the measures/strategy will work (SIc). These requirements are clearly linked and so the same Condition is set to address both SIb and SIc.
Condition	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SIb and SIc are met, specifically through demonstrating the following: SIb: "*There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species.*" SIc: "*There is an objective basis for confidence that the strategy will work, based on information directly about the fishery and/or the species involved.*"

Milestones	Year 1: • Conduct a review of the evidence base for interactions between the Lake Peipus gillnet and trapnet fisheries and asp and wels catfish as ETP species. • Develop a plan to implement a strategy to manage impacts on asp and wels catfish, paying particular attention to the MSC definition of a 'strategy' (Table SA8, MSC 2014). • Conduct and present a preliminary analysis to determine if the proposed strategy will work. • Resulting score = 65. Year 2: • If necessary, refine the strategy to manage impacts on asp and wels catfish based on the preliminary analysis presented at Year 1. • Implement the plan as designed in Year 1 / refined in Year 2. • Update the Audit Team as to progress of implementation. • Resulting score = 65. Years 3: • Continue implementing the plan as designed in Year 1 / refined in Year 2. • Present initial results from the implementation of the strategy. • Resulting score = 65. Year 4: • Demonstrate that the SG80 requirements of SIb and SIc are met, such that there is a strategy to manage asp and wels catfish as ETP species in place, and that there is an objective basis for confidence that it will work. • Resulting score = 80 (assuming that this Condition is met and that Condition 6 is also met. It is noted that if this Condition is met but Condition yy is not met then the resulting score will be 75).
Client action plan	Year 1. Develop a plan of implementation of a strategy to managing impacts of UoA on redlisted fish species. In the first turn, to pay attention to (i) collecting information about interaction of redlisted species with fishing gear, (ii) assessment of effect of fishery removals in the UoA on population status of redlisted species, and (iii) to developing measures to reduce effect of UoA on redlisted species as elements of the strategy. Collect and summarise available information about interaction of redlisted species with fishing gear in the UoA by interviewing stakeholders (fishery inspection, fishers). Contact a non-profit organisation which, according to information from the Estonian Marine Institute, deals with research and protection of asp (tag/recapture and telemetry studies, stocking of the young fish into the Emajõgi river, studies of the habitat use of asp). Year 2. Develop a plan to implement a strategy to manage impacts on asp and wels catfish. Conduct and present a preliminary analysis to determine if the proposed strategy will work. Year 3. Presenting initial results regarding the implementation of the strategy. If necessary, refine the strategy to manage impacts on redlisted species based on the preliminary analysis presented at Year 2.

	Year 4. Demonstrate that there is a strategy to manage asp and wels catfish as ETP species in place, and that there is an objective basis for confidence that it will work.
Consultation on condition	Letters of support for the Client Action plan have been provided by the Estonian Ministry of Environment and the Estonian Marine Institute, University of Tartu (please see Appendix 4).

Condition 6

UoA	**1 and 2**
Performance Indicator	**2.3.2:** ETP species management strategy
Scoring Issue	**SIe:** Review of alternative measures to minimize mortality of ETP species
Score	**65**
Rationale	There is consideration of asp and catfish stock status in the annual Estonian science review (e.g., EMI 2017), but it is not clear that there is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and that they are implemented as appropriate.
Condition	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SId is met, specifically through demonstrating the following: SIe: "*There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.*"
Milestones	Year 1: • Develop a plan to conduct regular reviews of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species, paying particular attention to the MSC definition of 'regular' (SA3.5.3.2, MSC 2014). • Resulting score = 65. Year 2: • Implement the plan as designed in Year 1. • Update the Audit Team as to progress of implementation. • Resulting score = 65. Years 3: • Continue implementing the plan as designed in Year 1. • Update the Audit Team as to progress of implementation. • Resulting score = 65. Year 4: • Demonstrate that the SG80 requirements of SId are met, such that a review has taken place and there is a process in place to ensure 'regular' reviews are

	undertaken. • Resulting score = 80 (assuming that this Condition is met and that Condition 5 is also met. It is noted that if this Condition is met but Condition xx is not met then the resulting score for the PI will be 70).
Client action plan	Year 1. Develop a plan to conduct regular reviews of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species. To carry out consultations with key stakeholders - Ministry of Environment, Estonian Marine Institute and Estonian Fund for Nature about organisation of such regular (once a two years) reviews. Year 2. Discussing with key stakeholders a plan on collecting field data on effect of UaA on redlisted fish species and analysis of feedback from them. Year 3. Reporting field data on interaction of redlisted fish species to key stakeholders and analysis their feedback on potential options to minimise UoA-related mortality of ETP species. Year 4. To summarise reviews from stakeholders and demonstrate that the SG80 requirements of SId are met. Feasible options to minimise discarding that are identified in Year 3 are implemented as appropriate.
Consultation on condition	Letters of support for the Client Action plan have been provided by the Estonian Ministry of Environment and the Estonian Marine Institute, University of Tartu (please see Appendix 4).

Condition 7

UoA	1 and 2
Performance Indicator	**2.3.3:** ETP species information
Scoring Issue	**SIa:** Information adequacy for assessment of impacts. **SIb:** Information adequacy for management strategy.
Score	**60**
Rationale	Only asp and wels catfish were determined to be ETP species, and both species were reported by stakeholders to be taken in the fishery very rarely. However, there is no quantitative information available that is adequate to assess the UoA related mortality (SIa). Further, while information including knowledge of asp and wels catfish spawning behaviour and habitat preferences, as well as some data on population status and fishing activity are collected, and is adequate to support measures to manage impacts, it is not adequate to measure trends and support a strategy to manage impacts on ETP species (SIc). These requirements are clearly linked and so the same Condition is set to address both SIa and SIb.
Condition	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SIa and SIb are met, specifically through demonstrating the following:

	SIa: *"Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species."* SIb: **"***Information is adequate to measure trends and support a strategy to manage impacts on ETP species.***"**
Milestones	Year 1: • Design a scientifically valid approach to address the condition by collecting quantitative data on asp and wels catfish captures and mortalities in the fishery, and measure trends. • Resulting score = 60. Year 2: • Implement the plan as designed in Year 1. • Update the Audit Team as to progress of implementation. • Resulting score = 60. Years 3: • Continue implementing the plan as designed in Year 1. • Present initial results from the implementation of the strategy. • Resulting score = 60. Year 4: • Demonstrate that the SG80 requirements of SIa and SIb are met, such that there is some quantitative information that is adequate to assess UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of asp and wels catfish, and that information is adequate to measure trends and support a strategy to manage impacts on asp and wels catfish. • Resulting score = 80.
Client action plan	Year 1. Develop a scientifically valid plan of collecting quantitative data on effects of UoA on asp and wels with fishing gear. To pay attention to three questions: (i) quantitative information on interaction of redlisted species with UoA gear, (ii) mortality resulting from these interactions, (iii) population trends of asp and wels. Year 2. Collection of field data on interaction of redlisted species with UoA gear and associated mortality. Year 3. Collection of field data on interaction of redlisted species with UoA gear and associated mortality. Year 4. Summarising of field data on interaction of redlisted species with UoA gear and associated mortality collected during years 2 and 3. Analysis of available data on population status of asp and well and assessment of risks for population of redlisted species caused by mortality caused by interaction with UoA fishing gear.
Consultation	Letters of support for the Client Action plan have been provided by the Estonian Ministry of

on condition	Environment and the Estonian Marine Institute, University of Tartu (please see Appendix 4).

Condition 8

UoA	1 and 2
Performance Indicator	**PI 3.1.3:** The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.
Scoring Issue	**SIa:** Objectives
Score	**60**
Rationale	The EU CFP does not apply to inland fisheries, so this is covered by national (Estonian / Russian) strategic objectives and management policy, as well as the agreement that underpins the ERFC. The Estonian Fisheries Strategy (2014 – 2020) explicitly mentions an ecosystem approach to fisheries management in Estonia. MoE also states that "The strategic goal of fisheries is to guarantee the good condition of fish populations and the diversity of fish species" and goes on to say "It is vital to avoid the negative effect fishing has on the ecosystem. Fish populations are considered to be in good condition when fish resources can reproduce themselves naturally in the existing environmental conditions and when the species have a characteristic age structure despite the pressure of commercial fishing" (MoE, 2016). The recently revised Fish Act (2015)'s state purpose is to (i) ensure conservation and economic use of fish and aquatic plant resources on the basis of internationally recognized principles of responsible fisheries; (ii) ensure reproduction capacity of fish and aquatic plant resources and productivity of bodies of water; and (iii) avoid undesirable changes in the ecosystem of bodies of water. The use of annually-evaluated TACs, allied with a comprehensive control system (both unusually for an inland lake) suggests that a precautionary approach is implicit in the management system, and thus meets SG 60. However the ecosystem approach is not necessarily precautionary, and thus SG 80 is not met. As a result a condition has been imposed to resolve this.
Condition	By the Year 4 surveillance audit, the client is required to demonstrate that the SG80 requirement of SIa is met, specifically through demonstrating the following: SIa: "*Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach are explicit within management policy.*"
Milestones	<u>Year 1</u>: • Provide evidence that approaches for embedding the precautionary approach into fisheries management on Lake Peipus have been discussed at national level. • Resulting score = 75. <u>Year 2</u>: • Provide evidence that approaches for embedding the precautionary approach into fisheries management on Lake Peipus are agreed at national level. • Resulting score = 75. <u>Year 3</u>:

	• Provide evidence that the agreed precautionary approach is proposed for adoption at the whole lake level at transboundary level. • Resulting score = 75. Years 4: • Provide evidence that the agreed precautionary approach is explicit within the management policy for Lake Peipus. • Resulting score = 80.
Client action plan	Year 1. Currently, preparation of a new concept on management of Estonian inland fisheries is in progress, according to Ministry of Environment. It is planned to incorporate in this document precautionary approach and a concept of sustainable management. The Client will observe process of preparation of this document, and also will consider with the Estonian stakeholders how to incorporate precautionary approach in the transboundary level. Year 2. Observance of process of preparation of a new document on management of Estonian inland fisheries, which will incorporate precautionary approach, and consultations about including precautionary approach in the management documents on the Peipus Lake level. Year 3. Observance of process of preparation of a new document on management of Estonian inland fisheries, which will incorporate precautionary approach, and consultations about including precautionary approach in the management documents of Peipus Lake level. Year 4. Providing evidences on including a precautionary approach in the documents on Estonian Inland fishery management and in all-Peipus Lake management.
Consultation on condition	Letters of support for the Client Action plan have been provided by the Estonian Ministry of Environment and the Estonian Marine Institute, University of Tartu (please see Appendix 4).

Appendix 4: Letters of support

Estonian Marine Institute, University of Tartu

From: Toomas Saat [mailto:toomassaat@gmail.com]
Sent: 29 June 2017 19:25
To: julia.nebolsina@marcert.ru
Cc: rob@ichthysmarine.com

Subject: Letter of support for MSC certification of Lake Peipsi perch and pikeperch fishery

Dear Dr Robert Blyth-Skyrme

Estonian Marine Institute, University of Tartu recently received a request from the company Logi-F for a letter regarding the Action Plan to address conditions set out in Marine Stewardship Council assessment of perch and pike-perch fishery in Lake Peipsi (Peipus). I am writing to confirm that Estonian Marine Institute has received the plan and our staff is working with the Logi-F to identify relevant information requirements to support the action plan to address the conditions. We recently started a new research project on Lake Peipus which will fill in some most important information gaps pointed out during the MSC assessment. I'm sure that in close cooperation with Logi-F we will find the solution to fulfil their client action plan and make the fisheries more sustainable.

Sincerely,
Toomas Saat

Director, Estonian Marine Institute
University of Tartu

Estonian Ministry of Environment

REPUBLIC OF ESTONIA
MINISTRY OF THE ENVIRONMENT

Estonian Presidency of the Council of the European Union
EU2017.EE

Marine certification LLC
julia.nebolsina@marcert.ru

10.07.2017 No 10-4/17/4951

Letters of support for the Client Action Plan

Estonian Ministry of the Environment, Fishery Resources Department, recently received a request from Marine certification LLC for a letter of support regarding the company Logi-F Action Plan certifying perch and pike-perch fishery in Lake Peipus.

I am writing to confirm that Estonian Ministry of the Environment has reviewed the plan and we are working with Logi-F to identify relevant information requirements to support the action plan.

While the Ministry has not formally committed resources to specific action plan activities at this time, we try to coordinate work in collaboration with scientists and environmental inspectorate on possibilities to support development of plan and to find out which part it is necessary to carry out the activities of the annex in addition to existing measures.

Sincerely Yours,

Kaire Märtin
Head of Fishery Resources Department

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Web Page www.envir.ee/ Registration No 70001231

Appendix 5: Meeting notes and stakeholder submissions at site visit

Note of Meeting: Logi-F (17th October 2016).

Name of the fishery	Type of assessment / audit
Logi-F Lake Peipus Perch and Pike-Perch	Full-Assessment

Venue of meeting	Date of meeting
Dorpat Conference Centre, Tartu	17th October 2016

Full name	Name of the organization	Position
Rob Blyth-Skyrme	Marine Certification	Lead Assessor, P2 Expert
Dmitry Sendek	Marine Certification	P1 Expert
Tim Huntington	Marine Certification	P3 Expert
Olgert Margus	Logi-F	Client, Owner Logi-F
Dmitry Lajus	Logi-F	Client Representative/Consultant
Antonio Hervás	Accreditation Services International	ASI Lead Assessor

1. Opening Comments

1. All participants introduced themselves and provided brief background on their roles.
2. RBS provided a presentation on the MSC, including the MSC assessment process (assessment tree, assessment stages and timelines) and opportunities for stakeholder input.
3. RBS highlighted the MSC's requirements on the use or otherwise of confidential information.
4. RBS indicated that a brief note of the meeting would be taken, and would be shared with participants as soon as possible.
5. A discussion was held on the site visit itinerary – meeting times/locations were confirmed by e-mail and telephone with other stakeholders.

2. The Fishery under Assessment

1. Two UoAs for the assessment were confirmed as follows:
    a. The perch gillnet and trapnet fishery in Estonian waters of Lake Peipus.
    b. The pike-perch gillnet and trapnet fishery in Estonian waters of Lake Peipus.
2. Two UoCs were also confirmed as follows:
    a. Perch from the gillnet and trapnet fishery in Estonian waters of Lake Peipus that are landed to Logi-F and any other processors in the client group.
    b. Pike-perch from the gillnet and trapnet fishery in Estonian waters of Lake Peipus that are landed to Logi-F and any other processors in the client group.
3. It was confirmed that no other gear types or species would be considered within the assessment.

3. Pre-Assessment

1. RBS highlighted that the Pre-assessment for the Logi-F fishery was carried out against CRv1.3, but that the Full Assessment was required to be carried out against CRv2.0, and that some

differences did exist (e.g., the requirement for review of measures to minimise discarding of unwanted catch).

4. Fishing Activities

1. Autumn (September-November) is when the perch and pike-perch are at their best quality. Autumn season lasts until the ice starts to form, at which point there is a stop in fishing – the ice is too thick for boats to go out but too thin to walk on. This stop period may last up to a month (normally November, but the last three years has extended in to December). It can be very short if the weather is right, though.
2. Winter period with ice lasts through until March-April. The end of the winter is again weather dependent – usually a 1 month break while the ice thins and disappears.
3. The fishing under ice can be very good at the start, using large-mesh gillnets for pike-perch and pike, but the quality of the fish declines during the winter as the fish don't feed. Spring fish are the thinnest.
4. Summer fish can be good but the quality declines if the soak time is too long – fish quality in summer now improving in general, though, as most fishermen take ice with them.
5. Fishing for pike and pike-perch with gillnets is done near the bottom. Nets are anchored at each end, may be intermediate weights used between the nets. These are set in the evening, retrieved early in the morning.
6. In the past there may have been a few more big pike-perch, but the size has been quite consistent in Lake Peipus over time.
7. Fillet output of pike-perch is 45% by weight of fish, fillet output for perch is 33% of the weight of the fish.
8. For perch, this year the size has been bigger – 40-60 g fillets are normal, so if assume 33% yield then fish are averaging 240-360 g.

5. Science and Management

1. There is a trawl survey undertaken, collecting size, age, sex structure for all the main species. Also there is some gillnet surveying, but this may not be used directly for the stock assessment.
2. The TAC is set in discussions between Estonia and Russia in the framework of Estonia-Russian Intergovernmental Fishery Commission (ERFC) and then divided equally for two countries. The annual TAC of Estonia is divided in to two, each covering a 6 month period. This is because Estonia has an Olympic system and the TAC might be taken too quickly if it could all be taken in one period.
3. The ERFC was established in 1994, but the management system in general has been in place since before this – it was previously a communist system.
4. The Precautionary Approach may not be explicit in the ERFC objectives, but the Commission does meet every 6 months, so there is precaution in the system. Also, bottom trawling has been banned, which is precautionary.
5. There are data available on the catches for different species in different gears available on the website of the Estonian Ministry for Rural Affairs.
6. Not clear if there is a master management plan/strategy for the ERFC.

6. Licensing

1. Licences are traded – they do have value. License is given by the number of certain fishing gear with the agreed parameters. Most often, the license is transmitted from generation to generation of fishermen.
2. Not sure if there are any particular criteria to allow fishermen to access licences.
3. Recreational fishermen do need a licence on the Estonian side. A recreational survey is also done periodically, for example 2010 and 2013. There is no licence for the Russian side, though.

7. Consultation and Stakeholders

1. The Lake Peipus Fisheries Council meets 4 x per year.
2. There must be a way for stakeholders to enter into dispute resolution with managers, for example if someone wanted more quota or had another problem. But the route isn't apparent?
3. Local people have access to license and the fishery in general – they have no privileges, but not discrimination, either.
4. The Setos and the Old Believers are fishermen, with communities on the Western side of the Lake.

This note was shared with meeting participants and edits made subsequently to ensure an accurate note of the discussion was recorded.

Note of Meeting: A. Ulukhaniyants (17th October 2016).

Name of the fishery	Type of assessment / audit
Logi-F Lake Peipus Perch and Pike-Perch	Full-Assessment

Venue of meeting	Date of meeting
Dorpat Conference Centre, Tartu	17th October 2016

Full name	Name of the organization	Position
Rob Blyth-Skyrme	Marine Certification	Lead Assessor, P2 Expert
Dmitry Sendek	Marine Certification	P1 Expert
Tim Huntington	Marine Certification	P3 Expert
Andrey Ulukhaniyants	Fishing Company	Owner
Dmitry Lajus	Logi-F	Client Representative/Consultant
Antonio Hervás	Accreditation Services International	ASI Lead Assessor

1. Opening Comments

1. All participants introduced themselves and provided a brief background.
2. RBS provided a presentation on the MSC, including the MSC assessment process (assessment tree, assessment stages and timelines) and highlighted opportunities for stakeholder input.
3. RBS highlighted the MSC's requirements on the use or otherwise of confidential information.
4. RBS indicated that a brief note of the meeting would be taken, and would be shared with participants as soon as possible.

2. The Fishery under Assessment

1. Two UoAs for the assessment were confirmed as follows:
    a. The perch gillnet and trapnet fishery in Estonian waters of Lake Peipus.
    b. The pike-perch gillnet and trapnet fishery in Estonian waters of Lake Peipus.
2. Two UoCs were also confirmed as follows:
    a. Perch from the gillnet and trapnet fishery in Estonian waters of Lake Peipus that are landed to Logi-F and any other processors in the client group.
    b. Pike-perch from the gillnet and trapnet fishery in Estonian waters of Lake Peipus that are landed to Logi-F and any other processors in the client group.
3. It was confirmed that no other gear types or species would be considered within the assessment.

3. Associations and consultation

1. Union of Fishermen of Peipus Lake is the union for commercial fishermen. Main function is to help fishermen get EU money.
2. There are not any associations for individual fishermen. There are some associations for recreational fishermen, though.
3. It is possible for fishermen to contact the Fisheries Minister (or any Minister). The New Minister went around the fishery to see different activities recently. But then industry wrote to him to talk about a change in mesh size for the gillnets and he did not respond adequately in industry's opinion. Regardless of how the request of a fisherman to the state body (through the association

or directly to the Minister), the public authority shall within one month to submit a written response.

4. For consultation on management, prior to the ERFC meeting in November, the Fisheries Association meets and the Chairman presents the Association's proposals to the Fisheries Council. But there are competing interests (e.g. Danish seine versus other fishermen) so the outcomes are not always good for everyone.

4. Licensing

1. You cannot get a new licence, only buy one from an existing licence-holder if he is willing to sell.
2. When someone buys a licence, it is a private sale, but the buyer has to have had their commercial training, also, in order to go fishing. The training can take 2-3 months to complete, and requires fishermen to attend courses.
3. It is possible for someone from the Setos or 'Old Believer' communities to purchase licences – there is no discrimination. Many fishermen, particularly on the western side of Lake Peipsi are from these communities.

5. Enforcement

1. Fines for breaking the rules can be very strict, and do act to dissuade people. There is a Euro 400 fine for a minor differentiation between the hail in quantity and the weighed quantity, but it can go up from there. About 20-30% of landed harvests are checked by inspectors annually.
2. There are some administrative limits (2000 Euros) for relatively minor rule-breaking. For violations below this value the inspector may issue a fine. For violations above this threshold, the infringer is sent to the court. Serious violations are assessed very strictly, and this contributes to the Rule of Law: for example, the fine for three boxes (about 100 kg) of undersized pike-perch may be around EUR 100,000.
3. If offences are repeated or are very severe, then in some cases the licence may be withdrawn for a year. The licence holder who is penalised cannot use the licence, but there is more than one person on the licence then the others can take it.
4. When the fishermen provide the hail in, there is a template/standard format for the hail – they use an SMS to give licence #, name of fisherman, amount of catch by species, and intended location of the landing.
5. The activities of all professional fishermen on the water body are tracked by VMS signal. The Ministry of Environment provides fishermen with these sensors, which are installed on the boat by inspectors. Being on a lake with a defective sensor is prohibited.

This note was shared with meeting participants

Note of Meeting: L. Naks (18th October 2016).

Name of the fishery	Type of assessment / audit
Logi-F Lake Peipus Perch and Pike-Perch	Full-Assessment

Venue of meeting	Date of meeting
Dorpat Conference Centre, Tartu	18th October 2016

Full name	Name of the organization	Position
Rob Blyth-Skyrme	Marine Certification	Lead Assessor, P2 Expert
Dmitry Sendek	Marine Certification	P1 Expert
Tim Huntington	Marine Certification	P3 Expert
Liivika Naks	Fishery Resources Department, Estonian Ministry of the Environment	Adviser
Dmitry Lajus	Logi-F	Client Representative/Consultant
Antonio Hervás	Accreditation Services International	ASI Lead Assessor

1. Opening Comments

1. All participants introduced themselves and provided a brief background.
2. RBS provided a presentation on the MSC, including the MSC assessment process (assessment tree, assessment stages and timelines) and highlighted opportunities for stakeholder input.
3. RBS highlighted the MSC's requirements on the use or otherwise of confidential information.
4. RBS indicated that a brief note of the meeting would be taken, and would be shared with participants as soon as possible.

2. The Fishery under Assessment

1. Two UoAs for the assessment were confirmed as follows:
    a. The perch gillnet and trapnet fishery in Estonian waters of Lake Peipus.
    b. The pike-perch gillnet and trapnet fishery in Estonian waters of Lake Peipus.
2. Two UoCs were also confirmed as follows:
    a. Perch from the gillnet and trapnet fishery in Estonian waters of Lake Peipus that are landed to Logi-F and any other processors in the client group.
    b. Pike-perch from the gillnet and trapnet fishery in Estonian waters of Lake Peipus that are landed to Logi-F and any other processors in the client group.
3. It was confirmed that no other gear types or species would be considered within the assessment.
4. It was confirmed that, if the fishery was certified, only fish sold through Logi-F and the client group would be eligible to carry the MSC logo. But there is a certificate sharing agreement in place for other processors to join Logi-F, and the MSC encourages this approach. Other fisheries can seek their own MSC certificate, though, if no agreement was found to be possible.

3. Liivika's Role

1. Liivika is an Adviser – a senior position sitting under the Head of the Fishery Resources Department, Ministry of the Environment.

2. Liivika is an Estonian Commissioner on the ERFC (and other trans-boundary fisheries issues) but is also actively involved in marine fisheries management.
3. Liivika participates in the annual Lake Peipus trawl and gillnet surveys but also spends some time on the Lake on board fishing vessels and vessels of Environmental Inspectorate, in order to understand the fishery and be better positioned to make recommendations.

4. The Estonian-Russian Intergovernmental Lake Peipsi Fisheries Commission (ERFC)

1. ERFC will meet only once per year from 2016. The Commission decides the TACs and quotas for different species, permit numbers and technical measures (gear types, their numbers, mesh sizes, etc.).
2. Prior to the main Autumn Meeting, Estonian science team does the research needed, Russian team does likewise. Then the two teams work together during about one week, and aim to make plans together. If they can make decisions that both sides are agreed, then it is good for the Joint Protocol. If they cannot agree, then the decision is made after negotiations in the ERFC itself.
3. If there is a difference in proposals for TACs, the decision is negotiated – why one thinks it should be higher or lower than the other – it isn't just a case of agreeing the mid-point.
4. If the Commission makes a decision, then it becomes Russian law immediately. But the decision has to be adopted in to Estonian law by an additional process, to bring into force the Regulation of the Minister of the Environment. The Estonian Minister of the Environment does not have the power to veto the Commission's decision.
5. Autumn Meeting in the past decided TACs and management measures for the full year, but some changes to the management might then be made at the Spring Meeting. From 2016 the Spring Meeting will not occur face-to-face, but changes will still be considered through e-mails and calls between Russian and Estonian members of the Commission as required.

5. Fishing Associations and Consultation

1. If fishermen think the TAC should be increased or reduced, or there should be more permits or less, then can they come to the Ministry of the Environment? Yes – a week before the ERFC meeting, the scientists and managers meet with fishermen and everyone listens to the positions and concerns.
2. Can anyone come to the meeting? Yes – it is an open meeting, advertised through the Fishermen's Associations. The positions have already been discussed between Estonian and Russian scientists so there is no secrecy in the discussions.
3. Why are there three fishing associations? Not clear, there are fishermen/companies from different fishing groups in each of the associations.
4. There is an agreement between the Ministry of the Environment and the fishing associations to work together, that was signed by at least two of the companies. The text can be provided.

6. Licences

1. Who issues the permits? Scientist says how much fishing gear can be used, and the fisheries regulations / measures.
2. Licence lists what permits are associated with it, and the permits list how much fishing gear can be used. The permits are not separate to the licence.
3. Fishermen must be listed on the licence if they are fishing the gear, even if they don't own the licence, but they must be a qualified commercial fisherman in order to fish.

4. There are four levels of training for commercial fishermen. The training includes different components – what they need to do to go fishing, what and how they need to report in terms of catches and protected species, etc.
5. New rules for the fishery will be coming in to place on January 1st 2017. These are already drafted and have been consulted on.

7. Objectives

1. Are there overarching objectives for fisheries? Not Estonian ones specific to the lake, but there is a Fisheries Programme that was produced a few years ago at the national level – it will be on the Ministry of Rural Affairs website.
2. Is there an objectives statement on the ERFC? Yes – it is produced in Estonian and Russian.
3. The Precautionary Approach isn't named in any fisheries legislation for this fishery – it is not in the latest Fisheries Act.

8. Monitoring and IUU fishing

1. Are there objectives for the enforcement and MCS processes? Yes, but it is their plan – The Ministry for the Environment can recommend what we are concerned about but they decide what to do.
2. Recreational fisheries seem to be growing, but illegal catches should be getting less.

9. Catches

1. How was the pike-perch quota exceeded in 2003 and 2006? In the past the logbooks were only submitted monthly, so the data were received too late in some cases and there were overruns. But since 2012 when the daily reporting came in the fishery can now be closed very quickly.
2. Are fisheries closed at 91-92% of the quota uptake? The Minister can close the fishery, but isn't required to close it. It is precautionary, but fisheries can be reopened for brief periods to get closer to the TAC if it is appropriate, but there is also some excess left to account for mistakes or other small quantities taken when targeting other species.
3. Keep a very close track of the fishery – the SMS messages provide the first warning but these are checked against the logbook reports to provide the final totals.

10. Pike-perch

1. Three surveys during the year. May – August – September. LN has been involved for 8 years. This is the year that we have seen the most large fish. Generally, there seem to be lots of 2012 fish, not many 2013 fish, good numbers of 2014 fish, very good numbers of 2015 fish
2. Is it common for large year classes to disappear? It can happen, mostly related to food availability, but there are also very good numbers of vendace currently, which is good food for these fish.
3. Small pike-perch taken in the Danish seine fishery. Scientists take account of the catches when calculating the quotas.

11. Other management

1. What is the approach taken if a stock declines - is there a process or guidelines that are followed to bring the stock back up to a healthy level? There are no guidelines at the ERFC but recommendations on TACs are made and these change annually.

2. Is there a review process to minimise discarding of unwanted catches? Fishermen are allowed to retain small quantities of a species even if the directed fishery is closed because quota is taken. If there is a mistake and too many fish are taken by accident then the fisherman can call the enforcement to say what has happened. Live fish should be released but there is no discarding allowed of dead fish. Fish can be released alive from the trapnets but not usually from the gillnets.

Information requested and/or Additional Questions

Note: All documents in Estonian language.

1. Copy of the Agreement between the Ministry of Environment and the fishing associations.

   Recognising their common responsibility in the Lake Peipsi, Lämmi and Pihkva ensuring the sustainable use of fish stocks, taking into account the international obligations of the Estonian Republic of Lake Peipsi, Lämmi and Pskov of fish stocks conservation and desiring to combine their efforts on the fight against illegal fishing, the Estonian of Ministry of environment and Ministry of agriculture and two fishermen's associations signed free will sub contract in June 2010:

2. Information on the fishery training programme that fishermen are required to pass in order to be commercial fishermen.

   https://www.envir.ee/sites/default/files/kalurid.pdf
   http://kalurikutse.ee/materjalid/rannakalur-tase-4-kutsestandart/

3. Copy of the ERFC Objective statement on how Lake Peipus will be managed.

   See Annex 1

4. Copy of the Draft 2017 fishing rules, coming in to place on January 1st.

   https://www.riigiteataja.ee/akt/121062016032

5. Copy of the bycatch limits for different species taken as bycatch if the directed fishery is closed because the quota is taken.

   https://www.riigiteataja.ee/akt/121062016032
   § 34 (in Lake Peipus)

6. Copy of the Estonian Fisheries Strategy (EFS) for 2014–2020
   http://www.agri.ee/sites/default/files/public/juurkataloog/KALAMAJANDUS/EKS/2014-2020/strateegia-eks-2014.pdf

This note was shared with meeting participants and edits made subsequently to ensure an accurate note of the discussion was recorded.

Note of Meeting: N. Laanetu (19th October 2016).

Name of the fishery	Type of assessment / audit
Logi-F Lake Peipus Perch and Pike-Perch	Full-Assessment

Venue of meeting	Date of meeting
Dorpat Conference Centre, Tartu	19th October 2016

Full name	Name of the organization	Position
Rob Blyth-Skyrme	Marine Certification	Lead Assessor, P2 Expert
Dmitry Sendek	Marine Certification	P1 Expert
Tim Huntington	Marine Certification	P3 Expert
Nikolaii Laanetu	Retired, University of Tartu	Stakeholder
Dmitry Lajus	Logi-F	Client Representative/Consultant
Antonio Hervás	Accreditation Services International	ASI Lead Assessor

1. Opening Comments

1. All participants introduced themselves and provided a brief background.
2. RBS provided a presentation on the MSC, including the MSC assessment process (assessment tree, assessment stages and timelines) and highlighted opportunities for stakeholder input.
3. RBS highlighted the MSC's requirements on the use or otherwise of confidential information.
4. RBS indicated that a brief note of the meeting would be taken, and would be shared with participants as soon as possible.

2. The Fishery under Assessment

1. Two UoAs for the assessment were confirmed as follows:
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2. Two UoCs were also confirmed as follows:
    a. Perch from the gillnet and trapnet fishery in Estonian waters of Lake Peipus that are landed to Logi-F and any other processors in the client group.
    b. Pike-perch from the gillnet and trapnet fishery in Estonian waters of Lake Peipus that are landed to Logi-F and any other processors in the client group.
3. It was confirmed that no other gear types or species would be considered within the assessment.

3. NL Role

1. NL worked at the University since 1961 but is now working for his own company doing Natura 2000 environmental assessment work.

4. Mammals

1. Big trapnets set up in rivers can be fatal to the beavers and otters, but gillnets are not because the animals just break them. However, impacts are only possible in areas within 50 m of the shore and in rivers, so the fishery under assessment is not of concern.

2. Musk rat can destroy the small traps easily but these are mainly set by poachers in rivers, not by commercial fishermen as they are not allowed to fish in these areas.
3. There are some traps set in river mouths under historic rights, but gear generally cannot be set within 500m of the river mouth.
4. Are fishery interactions with mammals very unlikely or just never happen? They are practically non-existent away from the shores and rivers.
5. There are no data known that show the fishery-mammal interaction rate, but this may be because it has never been considered a problem.
6. Mammal migration is undertaken for a short period of time. Otters migrate down the river to the lake in April to May, following fish when the ice disappears. They then feed in the shallow waters of the lake.
7. Fishermen don't like the mammals because they worry about, for e.g., otters eating fish and competing with the fishermen. But they don't shoot them – the fines or penalties would be too high (up to the confiscation of a fisher's license). Fishermen may not report entanglements, but interactions are only likely in the rivers in any case.
8. Otter is on the Estonian red list, but is in quite good status, in part because beavers are doing well – to go fishing, the otters use the access routes to the water that are created by beaver, as otters cannot make holes on their own. Beaver is not on red list – is doing well. Mink is all American mink. Musk rat is also invasive non-native.
9. Regarding indirect effects, only 20-30% of the summer diet in otters is fish, maybe 10% is perch. Most is baby birds. Only 10% of the diet in winter is fish, most is crayfish and frogs. Studies on this are available.
10. NL has spent 30 years studying mammal population dynamics. American mink hunt on musk rat (both non-natives), mink have reduced the musk rat abundance considerably. But then the water rat (native) use the musk rate burrows, although mink also eat those. Mink also push out native ferrets.

5. Birds

1. There is some research made on birds by Leho Luigujo, so this is available. Basic understanding that the effect is negligible.
2. Gillnets are used up until May 15th, and from September 1st, at which point the lake is ice free. What is the theory as to why there are no or very few interactions between the gillnets and diving birds? In Spring time, there are some areas where migrating and nesting birds are higher known areas – International Bird Areas – gillnetting is prohibited, so interactions are minimised. The maps are available online, possibly on the Ramsar website.
3. Not aware of any studies of bird interactions but this is likely to be because there is no perceived problem.

6. Habitats

4. There isn't a map of the underwater habitats in the lake, but a description should be available from the Centre of Limnology at Tartu University.

7. Information requested

1. Papers or links to papers on otter diet and seasonality.

This note was shared with meeting participants

Note of Meeting: U. Pirk and I. Metsanok (19th October 2016).

Name of the fishery	Type of assessment / audit
Logi-F Lake Peipus Perch and Pike-Perch	Full-Assessment

Venue of meeting	Date of meeting
Dorpat Conference Centre, Tartu	19th October 2016

Full name	Name of the organization	Position
Rob Blyth-Skyrme (RBS)	Marine Certification	Lead Assessor, P2 Expert
Dmitry Sendek	Marine Certification	P1 Expert
Tim Huntington	Marine Certification	P3 Expert
Urmas Pirk (UP)	Peipsi Flag	Stakeholder
Ilva Metsanok (IM)	Leader of Fish Processors Company	Stakeholder
Dmitry Lajus	Logi-F	Client Representative/Consultant (acting as translator for this meeting)
Antonio Hervás	Accreditation Services International	ASI Lead Assessor

Present for introductory presentation only before being asked to leave (MSC CRv.2.0, 7.9.1.1.a)		
Uve Seero	Logi-F	Client/Owner
Krislin Katin	Logi-F	Client/Owner

1. Opening Comments

1. All participants introduced themselves and provided a brief background.
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3. RBS highlighted the MSC's requirements on the use or otherwise of confidential information.
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2. The Fishery under Assessment

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    b. The pike-perch gillnet and trapnet fishery in Estonian waters of Lake Peipus.
2. Two UoCs were also confirmed as follows:
    a. Perch from the gillnet and trapnet fishery in Estonian waters of Lake Peipus that are landed to Logi-F and any other processors in the client group.
    b. Pike-perch from the gillnet and trapnet fishery in Estonian waters of Lake Peipus that are landed to Logi-F and any other processors in the client group.
3. It was confirmed that no other gear types or species would be considered within the scope of the assessment.

4. It was confirmed that other groups would be able to access the certificate through a certificate sharing agreement, or would be able to pursue their own certificate if that was desired instead.
5. It was confirmed that new species and/or new gears and/or areas can be added in to certified fisheries through expedited P1 assessments (species) and scope extension (gears or areas). Any Conformity Assessment Body (CAB) with 'Fisheries' in scope would be able to provide more information: http://www.accreditation-services.com/archives/standards/msc.

3. Introductions

1. The Peipsi Flag helps to support fishermen and fishing activities, but is not a fishing association.
2. There are three associations of Estonian fishermen at Lake Peipsi: the first association (Union of Fishermen of Peipsi Basin) unites 63% of fishing gears on the lake, the second (the head - Paul Kerberg) brings together 34% of the fishing gears, the third - 1% of the fishing gears.
3. As Leader of the FLAG and Chairman of the Union of Fishermen of Peipsi Basin, UP has a role as part of the Estonian delegation to the ERFC.
4. IM explained his role as leader of 11 fish processing companies - he helps them to obtain money from the state to purchase nets, traps, etc.

4. Role with the ERFC

1. What contribution does the FLAG make to the ERFC protocol? The Estonian scientists submit forecasts and the industry focus is on protecting their interests. In discussions with scientific staff they (FLAG) are trying to defend its position on the quotas, fishing gears.
2. How does the Association consult with and understand the position of the fishermen, and how is a position developed prior to the Autumn meeting? A series of ad hoc meetings are held through the year (7-8 meetings within the framework of the association has already taken place in 2016), with a more formal 'Fisheries Council' just before the ERFC meeting.
3. The Association also sometimes introduces its own voluntary agreements for management, for example in 2016 a ban on trap net fishing in the summer was agreed with the other associations, even though the gear was legal at that time. A voluntary ban on Danish seine fishing was also agreed 5 days before the official close of the Danish seine season in order to protect fish for the other fisheries/gears – i.e., gillnets, trapnets.
4. Protocols (minutes) are made for the Association meetings, but these would have to be requested from Pirk.
5. Several years ago, in the ERFC, the forecast from Russia and Estonia was very close, but now it can be different. The Russian forecasts for the TAC are typically less than the Estonian forecast. The Estonian estimates are still sustainable, though, it seems that the Russian managers would like to reduce the quota as Russian fishermen are not able to catch their quota.

5. Role with the Association

1. There is a formal process by which the Association can complain to the Government – the Ministry (Department of Environmental Protection at the Ministry of Labour) is required to reply in writing within one month, but it is usually faster. The letters can be addressed at different levels, depending on the level of concern – they can go to the Minister or even be sent to the Government (Estonian Parliament – Riigikogu) in general?
2. The Government was taken to court over a fisheries issue once in early 1990s, but not since – the Chief Fishery Inspector allowed a Danish seine fishery to occur during a ban.

3. The management and enforcement system works – the surveillance is strongest in Peipsi Lake, so no fish can be taken illegally – the risks are too high.
4. Fishermen don't have to be a member of an Association – it is not a requirement for a professional fisherman. There are six levels of professional fishermen, and the highest level are required to speak English.
5. Maybe 3% of fishermen are not members of an Association, but all active fishermen belong to an Association.
6. The illegal and lost gear clean-up programme was started by the Association in about 2009. Now it happens every year, and is organised by the Ministry of the Environment. The Inspector will have the data and they will be published in the protocols for the ERFC

6. Historic rights

1. Historic fishing rights are recognised – all fishing licences come from historic rights. The 3% of fishermen who aren't members of the Associations are basically retired now – they don't fish.
2. Ethnic minorities (Setu and Old Believers) are represented in the fishery
3. A fisherman will have a licence for particular amounts of different gear types and gear. But he will have to apply each year and be told how much he can use in any season. The licence indicates the responsible person, and type and number of gears.

7. Illegal fishing

1. Illegal fishing – about zero occurs. Sometimes it is done by people who come for holidays, but professional fishermen don't get involved as the fines are too big.
2. It is important that all the catch is accompanied with papers, and if it is in the shop then it must be identifiable through these sales slips.

This note was shared with meeting participants

Note of Meeting: M. Sare (19th October 2016).

Name of the fishery	Type of assessment / audit
Logi-F Lake Peipus Perch and Pike-Perch	Full-Assessment

Venue of meeting	Date of meeting
Dorpat Conference Centre, Tartu	19th October 2016

Full name	Name of the organization	Position
Rob Blyth-Skyrme (RBS)	Marine Certification	Lead Assessor, P2 Expert
Dmitry Sendek	Marine Certification	P1 Expert
Tim Huntington	Marine Certification	P3 Expert
Margit Sare (MS)	Peipsi Center for Transboundary Cooperation	Chairwoman/Project Manager PCTC
Dmitry Lajus	Logi-F	Client Representative/Consultant
Antonio Hervás	Accreditation Services International	ASI Lead Assessor

1. Opening Comments

1. All participants introduced themselves and provided a brief background.
2. RBS provided a presentation on the MSC, including the MSC assessment process (assessment tree, assessment stages and timelines) and highlighted opportunities for stakeholder input.
3. RBS highlighted the MSC's requirements on the use or otherwise of confidential information.
4. RBS indicated that a brief note of the meeting would be taken, and would be shared with participants as soon as possible.

2. The Fishery under Assessment

1. Two UoAs for the assessment were confirmed as follows:
    a. The perch gillnet and trapnet fishery in Estonian waters of Lake Peipus.
    b. The pike-perch gillnet and trapnet fishery in Estonian waters of Lake Peipus.
2. Two UoCs were also confirmed as follows:
    a. Perch from the gillnet and trapnet fishery in Estonian waters of Lake Peipus that are landed to Logi-F and any other processors in the client group.
    b. Pike-perch from the gillnet and trapnet fishery in Estonian waters of Lake Peipus that are landed to Logi-F and any other processors in the client group.
3. It was confirmed that no other gear types or species would be considered within the assessment.

3. Peipsi CTC and Fishing

1. Margit (MS) is a member of the Water Management Working Group of the Estonia-Russia Joint Commission on the Protection and Sustainable Use of Transboundary Water Bodies (Transboundary Water Commission).
2. Is there a formal relationship between the Transboundary Water and Fisheries Commission? They both come under the Ministry for the Environment, and the Fisheries Commission attends the Water Commission meetings, but possibly not the other way. There is some coordination of Working Groups (WGs) between the two Commissions.

3. Is there any discrimination in terms of access to local fishing opportunities? There are sometimes complaints about people earning more or less or people getting access or not, but not aware of anything serious.
4. Are there connections between CTC and the three fisheries associations? Not particularly, but now there are connections between the CTC and the Peipsi FLAG. MS was an evaluator for two projects submitted by the FLAG to the EU on fishing fairs.
5. MS cannot comment if the Fisheries Commission represents the Estonian fishermen well, or if there is good representation and coordination, but there is the Estonia-Russian WG before the main Transboundary Water Commission. Peipsi CTC is there but there are no other NGOs in the WG. Peipsi CTC is there because they have been active for 15 years. The WGs are very good things. The Water Commission is not so political and there is good discussion, the Fisheries Commission can be a little more heated, but the Cultural Commission does not work at all, now.
6. Is there an environmental objective to restore the lake to a better condition? Not really, there used to be lots of industrial pollution and farming pollution including from point source sewage and manure. But now it is probably mainly the town that is polluting.
7. Are there management objectives generally for the lake? Not that MS is aware of.
8. Whatever the CTC does in Russia, is done with the Russian partner organisation. The CTC gets some Interreg funds and other projects regionally but it is more difficult now as the EU is not funding projects with Russian components as much as previously.
9. Peipsi CTC doesn't work directly with fishermen, but did participate in a Lake ecosystem services project with fishermen and scientist (for example, participation in conferences, forums and public environmental education). NB – Reference obtained.
10. Pollution from fishing vessels seems to be very well controlled now – old boats are not used any more, and abandoned nets are being retrieved annually by the Environmental Board as part of the Ministry of the Environment.

<u>This note was shared with meeting participants</u>

Note of Meeting: M. Narusing (19th October 2016).

Name of the fishery	Type of assessment / audit
Logi-F Lake Peipus Perch and Pike-Perch	Full-Assessment

Venue of meeting	Date of meeting
Mehikoorma harbour, Estonia	19th October 2016

Full name	Name of the organization	Position
Rob Blyth-Skyrme	Marine Certification	Lead Assessor, P2 Expert
Dmitry Sendek	Marine Certification	P1 Expert
Tim Huntington	Marine Certification	P3 Expert
Margus Narusing	Fisherman	Fisherman
Uve Seero	Logi-F	Client/Owner
Krislin Katin	Logi-F	Client/Assistant
Dmitry Lajus	Logi-F	Client Representative/Consultant
Antonio Hervás	Accreditation Services International	ASI Lead Assessor

1. Opening Comments

1. Participants introduced themselves.
2. RBS provided a brief background on the MSC, and explained the team's interest in visiting the harbour to see some of the fishing vessels and gear, and in talking to stakeholders.
3. RBS indicated that a brief note of the meeting would be taken, and would be shared with participants as soon as possible.

2. The Fishery under Assessment

1. Two UoAs for the assessment were confirmed as follows:
    a. The perch gillnet and trapnet fishery in Estonian waters of Lake Peipus.
    b. The pike-perch gillnet and trapnet fishery in Estonian waters of Lake Peipus.
2. Two UoCs were also confirmed as follows:
    a. Perch from the gillnet and trapnet fishery in Estonian waters of Lake Peipus that are landed to Logi-F and any other processors in the client group.
    b. Pike-perch from the gillnet and trapnet fishery in Estonian waters of Lake Peipus that are landed to Logi-F and any other processors in the client group.
3. It was confirmed that no other gear types or species would be considered within the assessment.

3. The trapnet fishing gear

1. The large trapnet fishing gear has a leader of up to 100m length, and two pounds set at right angles to the leader, each pound section being up to a maximum of 100m in length. A number of baffles in the approach to each pound help to prevent the fish from swimming out.
2. The nets are laid out with wooden posts, but the pounds are also anchored in place.
3. Gear is checked and fish removed from the pounds, daily. The boats tie up to each end, and draw each pound in separately until the fish are contained alongside the boat. Fish are then dipped out

with a small net and sorted. Any undersized fish or fish that are out season or prohibited are released, the rest are retained.

4. Trapnets and gillnets are set in traditional locations. These aren't set out in legislation, but are passed down from fisherman to fisherman – the nets aren't moved around.
5. Gillnets are also used in the same locations from year to year, passed down from fisherman to fisherman.
6. About 80 fishermen work from Mehikoorma, some of them rent permits in order to fish.

4. ETP species interactions

1. Mammals are never seen in the trapnets in the lake, although there may be some seen in trapnets in the rivers.
2. In deeper areas away from the shore, birds are also very rarely seen. They have caught one cormorant this year so far. But there is no formal reporting process for birds. If there was more of a problem, maybe they would be asked to report them?

5. Enforcement

1. Fishermen see enforcement officers regularly. Sometimes the landings checks occur daily.
2. There is also some enforcement with the Border Police – they have a boat at Mehikoorma and a radar station just alongside.
3. Fines are very high for illegal fishing – they provide a very strong disincentive.
4. Fishermen have to call in with catches at least 1 hour before landing. The catch (by species) must be recorded in the fishing log before the arrival at the port. The landings checks require the estimates to be ±10%.
5. VMS is carried on all boats – the units have to be switched on before leaving port, but aren't turned on when in port. It is not clear how often the units ping.

6. Information Requested and/or Additional Questions

1. Are the nets laid out according to water current direction? I.e., the leaders in the direction of the current, the pounds adjacent to the current?
2. Is there a regulation or rule that only one (or two, three?) scoop(s) of fish is taken from the pound at any time, or that fish must be sorted and discards returned over the side within a certain amount of time?
3. Are the pounds open to the air at the surface – Ie., if a bird or mammal swam in to the pound, would they be able to reach the surface to breathe?
4. Are fishermen allowed to participate in more than one type of fishing on any given day – specifically, can Danish seine fishermen finish their day by hauling some gillnets or checking some trapnets?
5. Is transhipment allowed – i.e., are fisherman permitted to move fish from one vessel to another vessel when on the lake so that those fish can be taken ashore?
6. At the Mehikoorma Harbour, the assessment team saw a number of small rowing boats that apparently are used commercially to check a type of trap net. Do these rowing boats have VMS, and are they considered part of the UoA? If not, how will their catch be kept separate?
7. How many rowing boats are there in total?

8. Are asp, wells or grayling seen in the lake – if so, when and how many? Is there any reporting requirement for them? What happens if one is caught?

This note was shared with meeting participants

Responses of Mr. M. Narusing to information requests from the assessment team

Based on Skype interview done by Dmitry Lajus 10 December 2016. Replies are italised.

1. Are the trapnets laid out according to water current direction? I.e., the leaders in the direction of the current, the pounds adjacent to the current?

The wing (leaders) is set up perpendicular to current, to catch migrating fish, which migration routes are usually lie along with the direction of current. Because current are only significant in Teploe Lake, traps are oriented accordingly only there. In the Peipus Lake with weaker currents they are not taken into account while setting up the traps.

2. Is there a regulation or rule that only one (or two, three?) scoop(s) of fish is taken from the pound at any time, or that fish must be sorted and discards returned over the side within a certain amount of time?

Average interval between trap check is about three days. Fisherman inform border guard service and fish inspection one hour in advance before the trip, and all the traps are marked with coordinates. Thus fish inspection has opportunity to check the fisherman while they are checking the traps, but it is not necessarily take each time.

3. Are the pounds open to the air at the surface – Ie., if a bird or mammal swam in to the pound, would they be able to reach the surface to breathe?

Potentially birds and mammals may die due to absence of access to the surface, but in fact it takes place rather rare, only in autumn during bird migration (one or two per year, usually cormorants).

4. Are fishermen allowed to participate in more than one type of fishing on any given day – specifically, can Danish seine fishermen finish their day by hauling some gillnets or checking some trapnets?

Now restrictions like that occur, but in fact it never happens, because Danish seine works whole day, and a fisherman never has time to work with other gear. Sometimes a fisherman may work with trap and gillnet in the same day.

5. Is transhipment allowed – i.e., are fisherman permitted to move fish from one vessel to another vessel when on the lake so that those fish can be taken ashore?

There is no prohibition of such operation, but it never happens because they do not catch so much fish that the transhipment would be needed.

6. At the Mehikoorma Harbour, the assessment team saw a number of small rowing boats that apparently are used commercially to check a type of trap net. Do these rowing boats have VMS, and are they considered part of the UoA? If not, how will their catch be kept separate?

VMS are installed to all boats with engine, even if its power is 5-10 horse powers. Rowing boats are not used by themselves, they are pulled by a motorboat which is supplied with VMS. Therefore all fishing operations which use boats can be controlled with VMS.

7. How many rowing boats are there in total?

In total, in Mehokona port they have only one or two rowing boats.

8. Are asp, wells or grayling seen in the lake – if so, when and how many? Is there any reporting requirement for them? What happens if one is caught – are they released alive from trapnets and gillnets?

They record asp in their logbooks, and release them alive. Wells are also recorded, and Margus has a special agreement with fisheries researchers when he provide all the caught wells to fisheries research institute (both alive or died). Other fisherman do the same. Margus did not see grayling for many years – they only occur in rivers where there is no fishing.

Note of Meeting: V.Vaino and I. Kask (20th October 2016).

Name of the fishery	Type of assessment / audit
Logi-F Lake Peipus Perch and Pike-Perch	Full-Assessment

Venue of meeting	Date of meeting
Dorpat Conference Centre, Tartu	20th October 2016

Full name	Name of the organization	Position
Rob Blyth-Skyrme	Marine Certification	Lead Assessor, P2 Expert
Dmitry Sendek	Marine Certification	P1 Expert
Tim Huntington	Marine Certification	P3 Expert
Ivo Kask	Fisheries Enforcement, Ministry for the Environment	Chief Enforcement Officer
Vaino Vaino	Estonian Marine Institute, University of Tartu	Leader of the Lake Peipsi fisheries research group
Dmitry Lajus	Logi-F	Client Representative/Consultant
Antonio Hervás	Accreditation Services International	ASI Lead Assessor

1. Opening Comments

1. All participants introduced themselves and provided a brief background.
2. RBS provided a presentation on the MSC, including the MSC assessment process (assessment tree, assessment stages and timelines) and highlighted opportunities for stakeholder input.
3. RBS highlighted the MSC's requirements on the use or otherwise of confidential information.
4. RBS indicated that a brief note of the meeting would be taken, and would be shared with participants as soon as possible.

2. The Fishery under Assessment

1. Two UoAs for the assessment were confirmed as follows:
    a. The perch gillnet and trapnet fishery in Estonian waters of Lake Peipus.
    b. The pike-perch gillnet and trapnet fishery in Estonian waters of Lake Peipus.
2. Two UoCs were also confirmed as follows:
    a. Perch from the gillnet and trapnet fishery in Estonian waters of Lake Peipus that are landed to Logi-F and any other processors in the client group.
    b. Pike-perch from the gillnet and trapnet fishery in Estonian waters of Lake Peipus that are landed to Logi-F and any other processors in the client group.
3. It was confirmed that no other gear types or species would be considered within the assessment.

3. Fisheries enforcement background

7. Fisheries Enforcement is under the Ministry of the Environment, and is one of three groups in the Environmental Inspectorate – 1) Fisheries, 2) Forest and Hunting, 3) Waste and Pollution. The Inspectorate is based in Tallinn, but also has offices in Mustvee (NW lake Peipsi) and Johvi.

8. Inspectorate covers all inland waters of Estonia, and all fishing activities.
9. Border police – main function is to undertake border enforcement activity, but they do report illegal activities to the fisheries enforcement when they see them.
10. 13 officers and staff are based on the Lake. All inspectors go to the lake, but some more than others. All officers are trained for 6 months how to conduct inspections, draw up a protocol, measure fish and nets, etc. After this, the applicant must pass the exam. Officers can stop fishing, arrest fishermen, seize vessels and gear, and confiscate catches/gear.
11. Resources include 4 big boats of around 8m, 4 smaller RIBs of 5-6m, snowmobiles, patrol cars. Bigger boats equipped with net haulers and equipment to take away trapnets. Officers may be armed, but Lake Peipus is a low risk area.
12. Cross-warranted work between Russia and Estonia is not undertaken routinely, but Estonian officers can observe fishing activities in Russian waters as part of the ERFC
13. It is not possible for Russian vessels to fish in Estonian waters, or vice versa – a border patrol vessel would be on them in minutes.
14. Estonian officers can monitor Russian VMS. And there is good cooperation. The ERFC looks at the enforcement needs annually, but detailed plans for patrols are decided 1 – 2 days before the actual patrol.
15. There is an annual master plan for enforcement activity, that includes three large surveys for the Lake, in cooperation with the Border police and Water and Pollution Inspectorate. These occur over periods of three days to a week, but there are also special sub-plans for spawning period monitoring and checks of landings checks.

4. Monitoring and enforcement

3. On average 5% of all landings must be monitored, but no less than 3% at any port. Last year, there were 11,000 fishing days, more than 1,000 landings inspections, with a focus on the higher risk locations (i.e., close to 10% overall)
4. There is an annual evaluation of the performance of the enforcement strategy, but not a formal meeting.
5. Fishermen do report illegal activity. There is good cooperation, generally.
6. The focus on recreational activities is weather dependent, but typically 20% of the enforcement effort is focused on recreational activities.
7. It is difficult to say if illegal activities are a serious problem or not, but illegal activities have reduced since the introduction of VMS (the fifth year for the Danish seines, the first year for all boats).
8. The penalties for infringements are assessed from the estimated impact of the illegal activity – catch values are estimated from a standard table (i.e., €xx per fish of each species), but if the damage is estimated to be >€4,000, then it will go to court. If less, then there would be an administrative penalty. Tickets are issued and are required to be paid within 15 days.
9. To request a summary enforcement report – how many hours officers spent patrolling, how many verbal warnings, how many tickets issued, how many successful court cases – the assessment team should request information from the Ministry.

NB – I.Kask left the meeting after 1.75 hours.

5. UoAs for the fishery under assessment

6. Difficult to combine pike-perch and perch gears together in one UoA. 130 mm stretched (65 mm knot to knot) gillnet for pike-perch, bream and pike is used 1st Jan – 25th April and 15th September until end of year. 30-40 mm knot to knot gillnet for roach is used 1st March – 5th May, but can only be used within 1km of the shore to catch roach and silver bream, but they also catch pike that are discarded. Fishermen try to do this alive as discarding of dead fish is not allowed. The gear is soaked overnight.
7. Northern areas tend to be better for pike-perch, southern areas tend to be better for bream. Perch are taken in small amounts in the small mesh gillnets.

6. Stock assessment and monitoring

1. The scientific group consists of 2 full time staff and seasonal technical personnel, who assess the status of stocks, recommend the TAC values and fishing regime throughout the year. During the year, scientists watch the fishing, do fishery research surveys, and work with fishers to study their catches.
2. Updated catches by gear type are available online from the Ministry for Rural Affairs.
3. Main science tasks before the ERFC Autumn meeting is to conduct the stock assessment, provide the TAC forecast and management, plus undertake age, sex and size sampling of catches.
4. Fishery-independent bottom trawl surveys are funded by Government, coordinated with Russian researchers. Survey estimates size structure, sex structure, age structure and total population size related to commercial size for different species. In general, fish have 1 year of spawning before entering the fishery.
5. In general, F=M=0.2 is assumed to be F_{MSY}, but F=0.25 is used in some cases. $F_{0.2\text{-}0.25}$ is used to calculate the quota. M can be higher than 0.2 for the younger year classes, but 0.2-0.25 is used to account for illegal or other uncounted fishing. In fact, the TAC is intended to correspond to the concept of MSY, although this is not specified in regulatory documents.
6. Pike-perch spawning depends on temperature much more than on the biomass – larval survival can be very different, so focus is on biomass at commercial size not SSB. Recruitment can vary by at least 3 factors from the same stock.
7. There is no description currently of the Estonian stock assessment methodology, but there is a plan to describe it for the next ERFC meeting. This will be prepared by the end of November, and the ERFC protocol will be available within 5 days.
8. There are four fishery-independent trawl surveys. There is coordination between Estonia and Russia to standardise the surveys, the joint program of monitoring works is included in the proceedings (protocols) of ERFC.
    a. Spring (Vendace, smelt, perch, age and size structure, and spawning pike-perch),
    b. Late June/early July (adult pike-perch size-structure, growth analysis, stomach contents, distribution of vendace)
    c. Mid-August (bream and roach stock assessment)
    d. Mid-October (pike-perch, perch and pike, but also roach as they move in to deeper water. Because water is cold, fish go to the bottom and are well-sampled. Stomach content work is undertaken as well as size, sex and age).
9. Stomach contents work is focused on pike-perch, which can inform the model development and TAC forecast for the following year. The Autumn focus on juvenile pike-perch is focused on understanding what feeding is like in preparation for the following year. If growth is likely to be

slow because of lack of forage fish, then natural mortality increases, but fisheries induced mortality is lowered by providing less fishing days for Danish seine.

10. Russian and Estonian stock assessments may give different results by the time the survey is undertaken in Autumn, if by this time the Estonian fishery has ended so the bream (in particular) move in to Estonian waters to escape the Russian fishery. Also, weather (first winds) can be very different between the Russian and Estonian areas. Also, there is a high heterogeneity of bottom habitats, so some sites may be more easy to trawl than others, and some sites cannot be trawled.

11. Estonia and Russia each do 20-25 standard trawl survey stations (depending on conditions), each with a half hour tow. Attempt to keep the same areas year to year, but may not always be possible if commercial gears are set up across the station. The trawl design between years and between Russia and Estonia is generally consistent, although minor differences can occur.

12. There is also a scientific gillnet survey, using meshes of 45, 55, 65 and 75 mm knot to knot. Focus is on spawning pike-perch in the southern part of Lake Peipsi. But also some direct comparisons of the commercial fishery, using commercial gear, to look at catches and potential for discarding. There can be some differences between the catches in the survey and the reported catches in the fishery.

13. Is there evidence of the bycatch and discarding levels in the trapnets? Yes, there are some independent scientific trapnets that are fished. But discarding mortality in the commercial trapnets may depend on the way the fish are handled and the speed of getting the fish out of the net, sorted and then discarded. Investigations of this issue have not been undertaken. By visual observation, the direct mortality can be high, hidden mortality (induced by the handling and occurring maybe days later) needs special investigation.

14. In 20 years, maybe 10 birds in total seen in gillnets, and a couple of beavers and couple of otters, but the mammals were seen in the river fishery, not in the lake fishery UoAs.

15. In recent years, some unaccounted for fishery mortality has appeared for pike-perch. That is why in the calculation model for TAC we use $F_{0.2}$, occasionally $F_{0.25}$, but not $F_{0.3.}$ This may be from the summer trapnet fishery, which has increased in intensity in recent 3-5 years. There is now a proposal to look at this issue, but waiting for funding (possibly from EU).

16. Perch trapnets – used 5 km or more from shore, wings 200 m with two traps (applicable mainly for Peipsi Lake). The other type – lines of trapnets, use larger mesh sizes. Up to 700m long line of nets, bigger mesh sizes and up to 30-40 traps (applicable mainly for Teploye Lake – because of the water current).

17. Over the past 20 years we have limited the use of active fishing gear – Danish seine, now we catch with them just a few days. If there is need to support the stock of pike-perch, the only possibility is to reduce the summer fishing with trap-nets, since Danish seine fishery is taken to minimum.

Population status

1. Current status of pike-perch might be just slightly below the status of a decade ago at the present level of productivity of the water body, because in former times the catch was up to 2000-3000t, but now the catch is around 1000t. Since 2007 a stock of smelt has been undermined because of strong generations of pike-perch and perch. In this connection, feeding conditions for pike-perch of first years of life have deteriorated and catches of pike-perch fell. Currently smelt is restoring, so it is expected that a pike-perch stock will grow. Thus, pike-perch production is highly dependent on forage availability of smelt.
2. Perch current status is connected to the pike-perch – If pike-perch was good then the perch stock would not be. Currently, perch is doing well.

3. Stocks of pike-perch and perch are regarded and managed as uniform, without divisions on subpopulations.
4. Pike current status is 1.5 – 2 times less than 20-30 years ago, but probably not related to fishing pressure. It is a bycatch species, but environment for spawning pike is also quite good for pike right now. Possibly recreational pressure is a factor?
5. Bream current status is very good, with catches at the same level as the early 1950s.
6. Roach current status is good conditions.
7. If there is a stock which is considered to be heavily impacted, regulations are formulated in accordance with the Ministry of Environment, but there isn't a formal process or timeline for managers to follow to rebuild the stock. But, for example, roughly 15 years ago had problem with pike-perch, spring Danish seine was banned, then summer Danish seine was banned, now only lasts for roughly 1 month in Estonia (sometimes less). The idea/plan was to reduce fishing mortality on younger cohorts. Details of the relevant management discussions should be available in the annual reports to the Ministry of the Environment from the science department. In summary, though, management discussions are undertaken together with Ministry of Environment and process of regulations is dependent on the current situation for the stock. For example, after collapse of the smelt population, the commercial fishery for smelt was prohibited.
8. The LRP is not defined formally, and is isn't used for fisheries management. But the pike-perch stock is well above that. For example, in the 1950s, 60s, 70s the pike-perch stock was impacted by Danish seines and the catch was very low, then in the early 80s the number of Danish series was reduced and the pike-perch stock quickly recovered to a much higher level. The stock is not currently below the PRI.

7. Management

1. There is not too much disagreement about the overall TAC at the ERFC, but there is discussion over the allocation between gear types because the Estonian fishery is focused more on gillnets and trapnets, whereas the Russian fishery is based more on Danish seines. More undersize pike-perch are taken in Russian fishery than the Estonian fishery because they take more of the catch in Danish seines.
2. In some years, the Estonian Danish seine fishery uses 55 mm knot to knot mesh in the codend to minimise catches of perch if the perch quota is exhausted. It also reduces undersize pike-perch bycatch and in such case, the usual pike-perch minimum size limit of Tl=46cm is also set.
3. Estonian fishery is more intensive and effective in the first half of the year until September, but the Russian fishery increases in intensity in the second half of the year.
4. For a researcher, the Estonian Olympic system (effort quotas) is better because the quotas are always taken, but the catches are never taken in the Russian IQ system until the very end of the year. In the latter case, it is not clear if the quotas are really taken or if some of the catches are hidden.
5. Pike-perch are almost never taken by the recreational fishery, but perch are taken by the recreational fishery – some years can be about the same as the commercial fishery if the perch are large (so people want to catch them) and weather conditions permit (i.e., ice conditions). The recreational fishery is accounted for in the forecasting by adding on an assumed catch – is an informal process, but if the fish are large then it is assumed more will be taken by recreational fishers.
6. In some years in the 2000s, the Estonian TAC was exceeded previously because of the monthly data collection and the delay in getting data, but also some years there was a quota exchange

from Russia to Estonia and these exchanges aren't reflected it the data (so there would not have been overruns if the extra quota was included).

7. Approximately 70 companies own licences, but 60 companies actively fish in the lake; only 8 are allowed to use Danish seines. The lower MLS for pike-perch was only initially given to the Danish seine in early 1990s, but then introduced for trapnets maybe 5 years ago. Data indicate that about 100 t of pike-perch between the normal and lower MLS may be caught every year by Estonian fishermen.
8. In October, two or three weeks in advance of the ERFC, there are meetings between the Ministries of Rural Affairs and Environment, Estonian Marine Institute, University of Tartu. The fisheries Associations and Fisher Inspectors to discuss the regime of fishing and quota.
9. Russian and Estonian researchers may deal with small issues together, but generally the Estonian and Russian positions and results are dealt together before the ERFC by scientists.
10. In the last days of the ERFC, the Heads of the Commission agree the decision and sign the protocol. That then goes to the Department for them to turn it into an Estonian legal framework for the Minister for the Environment to sign off.
11. The Russian decision go to the State Ecological Expertise Committee before going to the ERFC, so the decision is legally binding for them from the point it is signed.

8. Long and short term objectives

1. Before the ERFC commenced, there were high level agreements in 1994. There were explicit obligations expressed, but not objectives. There are no other long-term objectives.
2. Law (2015) and rules (1999) are being updated in 2017.
3. There are some objectives in the Lake Peipus area regional strategy (there are 7 large areas and respectively 7 regional strategies in Estonia) - this is available from Development Association of Peipsi Fishery Area (www.pkak.ee).
4. The precautionary approach is not required to be used explicitly, but there are no other lake fisheries in Estonia that use a TAC and this is implicitly involves taking a PA. It may be worth looking at the idea that the water and fish contained within it are public goods in Estonia (i.e., to see if there is an overarching objective for the Government requiring a PA for public goods), but it is not clear that this is the case.
5. There is also a publication in a journal by Russian researchers who undertook a review of the management of the Lake. Bobyrev et al, 2013 (on DropBox).
6. Is there an external review of the stock assessments? Until 1991 it was only a Russian survey, then the Estonian-Russian joint survey commenced after 1994. The ERFC process involves consideration of the two positions.

9. Information Requested and/or Additional Questions

Note added by V. Vaino:

According to the contract between Ministry of Environment and University of Tartu, all rights of our works (including data and results) are the property of Ministry of Environment. Currently we are legally not able to provide the data. If we get an agreement to share the data and results, we need to put lots of effort into compiling them into the needed format. Currently we don't have any resources to undertake such work. Some of the requested data and results are not analysed and some questions need additional research and resources to make the research.

1. Presentation on pike-perch stock dynamics and relationship to other environmental variables (e.g., water temperature, smelt abundance, nutrient levels, etc.).
2. The description of the stock assessment process for perch and pike-perch, when it is publicly available (end November?).
3. Data/information/review of stock status for perch, pike-perch, bream, pike, roach, pike, ruffe and burbot.
4. The regional strategy for Lake Peipus region.
5. Notes from the annual science reports to the Ministry of the Environment that details the approach taken roughly 15 years ago to reduce fishing mortality on pike-perch in the Danish seine fishery to recover the stock.
6. Any data showing catches of protected species in gillnets and trapnets comparable to the commercial fishery (including any data showing zero catches).
7. Number of (i) 'on lake' and (ii) landings inspections carried out by the Fisheries Inspectorate each year since 2010, if possible with the total number of fishing trips undertaken that year (e.g., to indicate the percentage of trips inspected). This can be for Lake Peipsi and Lake Lämmijärv / Pihkva as a whole, or broken down by port / region (useful, but not essential).
8. Number of administrative penalties given to fishers on Lake Peipsi each year since 2010, if possible grouped into different infringement classes.
9. Number of criminal cases against fishers on Lake Peipsi each year since 2010, and their result (not guilty / guilty), if possible grouped into different infringement classes.
10. Growth of perch and pike-perch by length and weight for several last years.
11. Age dynamics of sexual maturation of pike-perch (perch) and commercial size limits for pike-perch (perch) in several last years.
12. Proportion of different age groups of perch and pike-perch in commercial catches (for trap-nets and nets) of the Lake Peipus in different years.
13. Assessment methodology for estimation levels of recreational fishery and details – how results obtained are accounted for when establishing TAC (with examples for perch and pike-perch).
14. Specific examples of the use of environmental information from the scientific catches for determining the TAC value and the establishment of fishing regime for pike-perch: for example, in years 200…, 201… low growth rate and poor repleteness of pike-perch juveniles caused TAC reduction and limitation of the use of fishing gear with a small mesh size, and vice versa.
15. Comparison of actual catch levels of pike-perch and perch with TAC values for series of years (for Estonia, for whole Lake Peipus).
16. Confirmation that Russian scientists use a similar methodology as Estonian scientists to assess stocks of the main commercial fish in the Lake Peipsi.

This note was shared with meeting participants and edits made subsequently to ensure an accurate note of the discussion was recorded.

Appendix 6: Peer review reports

Peer review report 1

Summary of Peer Reviewer Opinion 1

Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?	**Yes/No**	**CAB Response**
Justification: Yes		Noted, thank you

Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe? ***[Reference: FCR 7.11.1 and sub-clauses]***	**Yes/No**	**CAB Response**
Justification: Yes, assuming that the data will be forthcoming as for plan in the next 4 years.		Noted, thank you

If included:

Do you think the client action plan is sufficient to close the conditions raised? ***[Reference FCR 7.11.2-7.11.3 and sub-clauses]***	**Yes/No**	**CAB Response**
Justification: *Yes, it would appear so.*		Noted, thank you

Table 1: For reports using one of the default assessment trees:

PI	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.1.1	No	No for Perch. Yes for Pike Perch	NA	Table 11 in the report. Are there survey catch numbers for after 2012? It would be good to see survey abundance and weights for up to 2015 or 2016 to get a better picture of the year classes strenght in the perch stock.	Thank you for your comment. We contacted the Marine Research Institute, and it was confirmed that the data have been collected. However, the scientist in charge was on holiday and out of contact. These data will therefore be updated at first surveillance.
1.1.2	NA	NA	NA		No comments noted.
1.2.1	Yes	Yes	Yes		No comments noted.
1.2.2	YES	Yes	Yes		No comments noted.
1.2.3	No	No	NA	For both the stocks under consideration, in this report there are no records for catches of perch and pike-perch that occur in Russia. It is clear that catches in Estonia are conservative and virtually always within TAC recommendations but the readers should be supplied with catch numbers from the Russian side to verify that the Russians also fish within TAC recommendations. The status of the stocks as surveyed in Estonia is also dependant on the activities that occur in	Thank you for the comment. We note that Section 3.4.1, Fishery Background, states that "In Russia, individual quotas are allocated for companies, and very often quota is taken only partly because not all companies are able to take their quota due to capacity limitations. Because of this Russian companies have under-used their quota for a long time, but in the most recent years a larger proportion of the quota has been taken and now this proportion approaches three quarters of the TAC." Nevertheless, catch data relative to TACs for the Russian

PI	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
				Russia and catches from Russia should be at the very least considered to evaluate if there is unwanted additional mortality in their waters. Furthermore, catch data for the perch sport fishery shuld be properly verified as there is mention that sport fishery catches can be quite significant, at times amounting to half the commercial catches.	as well as the Estonian component of the fishery are available online, here: https://www.agri.ee/et/eesmargid-tegevused/kalamajandus-ja-kutseline-kalapuuk/puugiandmed. We note the comment on the perch sport (recreational) fishery, and highlight that Condition 2 has been set specifically to address what is considered to be a weakness with respect to recreational (and IUU) fishing for perch. In acknowledgement of not down-scoring a fishery multiple times for the same issue, this was not also picked up in PI 1.2.3. In any case, we note that the scoring commentary for SIc highlgihts that "Estimation of the level of recreational fishing is based on questionnaires completed by recreational fishers and organised by the Ministry of the Environment every 3-4 years.", which we contend supports the score of 80 for this PI.
1.2.4	Yes	Yes	Yes		No comments noted.
2.1.1	Yes	Yes	NA		No comments noted.
2.1.2	Yes	Yes	NA		No comments noted.

PI	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.1.3	No	No	NA	There may be overconfidence with the 100 score because no information is reported on the status of these species in Russian waters. Although the management seems sufficient in Estonian waters, it is not clear if the same type of management is also performed in the Russian part of the lake.	Thank you for the comment. Russian and Estonian scientists conduct separate surveys and assessments to inform the management process, which is coordinated at the lake level through the ERFC. Reporting on performance, covering both the Russian and Estonian fisheries, is available online and is updated in near real-time (as noted above). The scoring text for 2.1.3 has been updated to make this clearer, but we continue to believe that 100 is the appropriate score.
2.2.1	Yes	Yes	NA		No comments noted.
2.2.2	Yes	Yes	NA		No comments noted.
2.2.3	Yes	Yes	NA		No comments noted.
2.3.1	Yes	Yes	NA		No comments noted.
2.3.2	Yes	Yes	Yes		No comments noted.
2.3.3	Yes	Yes	Yes		No comments noted.

PI	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.4.1	Yes	Yes	NA		No comments noted.
2.4.2	Yes	Yes	NA		No comments noted.
2.4.3	Yes	Yes	NA		No comments noted.
2.5.1	Yes	Yes	NA		No comments noted.
2.5.2	No	No	NA	I would argue that the score for this clause is too high and this PI (a) should score 80 as there is no **plan** in place which contains measures to **address all main impacts of the UoA** on the ecosystem. I agree with the assessment team that there is a suite of measures that together may be called a strategy, but a plan explicit to manage ecosystem impacts of the fishery on the ecosystem is not in place. A plan as such would contain objectives, maybe reference points and other indicators to clearly identify and manage fishery impacts, or absence thereof, on the ecosystem. As such, the score should be 80.	Thank you for the comment. We have added details to the scoring text of the Estonian Fisheries Strategy (2014 – 2020), which explicitly mentions an ecosystem approach to fisheries management in Estonia. The MoE also states that "*The strategic goal of fisheries is to guarantee the good condition of fish populations and the diversity of fish species*". With this text and additional details provided, we believe this now better explains why a score of 100 is justified for this fishery.
2.5.3	Yes	Yes	NA		No comments noted.

PI	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
3.1.1	Yes	Yes	NA		No comments noted.
3.1.2	Yes	Yes	NA		No comments noted.
3.1.3	Yes	Yes	Yes		No comments noted.
3.2.1	Yes	Yes	NA		No comments noted.
3.2.2	Yes	Yes	NA		No comments noted.
3.2.3	Yes	Yes	NA		No comments noted.
3.2.4	Yes	Yes	NA		No comments noted.

Table 2. For reports using the Risk-Based Framework:

PI	Does the report clearly explain how the process(es) applied to determine risk using the RBF has led to the stated outcome? Yes/No	Are the RBF risk scores well-referenced? Yes/No	Justification: Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response:
1.1.1				
2.1.1				
2.2.1	Yes	Yes		No comments noted. However, we highlight that the PSA for Crucian carp was included only for context, and was not used in the actual scoring.
2.3.1				
2.4.1				
2.5.1				

Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary) can be added below and on additional pages

Some comments added within report.

- Assessment Team Response: Thank you – we have reviewed and accepted the comments where possible.

Peer review report 2

Summary of Peer Reviewer Opinion 2

Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?	**No**	**CAB Response**
Justification: The scoring of P3 is justified, with a few relatively minor questions. Principle 2 is mostly well justified, but with some more significant issues, e.g. over reviews of unwanted catches and use of the RBF. Principle 1 seems to raise some major issues, particularly over the basis of the stock assessment, reference points and the way that HCRs would apply in a declining stock situation. This seems to require further clarification.		Noted, thank you. We have responded to the points made below, and believe the edits made to the report have improved the report in better justifying the scores awarded.

Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe? ***[Reference: FCR 7.11.1 and sub-clauses]***	**Yes**	**CAB Response**
Justification: There are some points raised at which the conditions may benefit from expansion or clarification, but these seem essentially sound.		Noted, thank you. We have responded to the points made below against scoring comments.

If included:

Do you think the client action plan is sufficient to close the conditions raised? ***[Reference FCR 7.11.2-7.11.3 and sub-clauses]***	**Yes**	**CAB Response**
Justification: With some minor exceptions, the CAP seems appropriate to the requirements of the conditions.		Noted, thank you. We have responded to the points made below against scoring comments.

Table 1: For reports using one of the default assessment trees:

PI	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.1.1 Perch	Y	N	NA	SIa: The PRI does not seem to have been established. Whilst the stock status gives confidence that SG80 is met, can we have a high degree of confidence in the absence of knowing where PRI is? SIb: This PI acknowledges that the definition of msy is uncertain. The scoring here is probably correct, but would benefit from a clearer linkage/equivalence between TAC-setting and Fmsy.	Thandk you for the comments. The assessment team notes that the MSC allows the use of proxy indicators for the PRI, and the status of the stock with respect to the historic status indicates clearly that there is a high degree of confidence that the stock is not below the PRI. For perch, the stock has been in good shape since the 1930s, and this species spawns in numerous locations around Lake Peipus. Meetings of the ERFC in autumn 2015 and 2016 reported that stock status of perch is now on high level due to high recruitment of 2012 and extremely high recruitment of 2015 (ERFC 2015, ERFC 2016). More detail has been added indicating that the TAC is set each year and the fishery activities are regulated via fishery mortality (F), which is recommended to set like $F \leq M = 30\%$ Ba (natural mortality of the middle ages), that is a proxy value consistent with F_{MSY}. A precautionary suite of management measures and tools ensures that fishing effort is low for recent years (actual $F_{0.2\text{-}0.25}$) so the stock remains at productive levels that are appropriate to the scale and intensity of the fishery. Given the annual sureys and level of detail available in the catch data, and the scale and intensity of this

PI	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
					fishery, the data readily support a score of 100 for SIa (i.e., There is a high degree of certainty that the stock is above the PRI) and a score of 80 for SIb (i.e., The stock is at or fluctuating around a level consistent with MSY).
Pikeperch	Y	N	NA	As for perch.	Noted, thank you – please refer to the comment above for perch, as a very similar situation exists for pike-perch with respect to the TAC, although the time series of high pike-perch abundance extends back only 30 years to the late 1980s.
1.1.2 Perch	Y	Y	NA	Rebuilding is not required.	Noted, thank you.
Pikeperch	Y	Y	NA	As for perch.	Noted, thank you.
1.2.1 Perch	N	N	NA	SIa: This is an interesting question as the HS must work towards objectives. As this is essentially a multi-species fishery, the specific objectives for perch/pikeperch (especially as reference points) are not clear. As these are the main commercial species, however, then maintaining these at a level equivalent to msy is assumed, but it should be made clear how this is achieved (e.g.	SIa: A new section on the approach taken to the management has been added to the introduction (Section 3.5.6) and additional text has been added to the scoring rationale, to reflect that the estimates of Ba is used to calculate 20-25% Ba. The TRP (which is also equivalent to the limit reference point (LRP)) based on 20-25% Ba is used to establish annual fishing opportunities for perch and pike-perch (i.e.,

PI	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
				whitefish is managed in the same way but is probably not at Bmsy). SId: The ERFC meetings seem to provide a good forum for regular reviews of the strategy? SIf: There is no evidence of a review of 'alternative measures' to minimise unwanted catch; having measures such as mesh size restrictions and closed areas/seasons does not seem to automatically meet requirements to seek 'lowest achievable levels' (SA3.5.3.1). It is noted that discarding is reported in PI 1.2.2 SIb and is the subject of a condition and that pikeperch has attracted a condition for this PI.	fishing mortality, considered as $F_{0.2\text{-}0.25} \leq M$, is used with the same intent as F_{MSY}) SId: Thank you for the comment – the Assessment Team agrees that the ERFC provides a good forum for reviesing the strategy, but it was not clear to us that all elements of the specific harvest strategy of the fishery are reviewed and improved, if necessary. As such, we felt this SG100 level requirement was not met. SIf. A key approach to minimising discarding that we didn't bring out in the text is that directed fishing for primary species is curtailed when approximately 90% of the quota is taken, leaving the rest for catches in other parts of the fishery, thereby minimising the potential for discarding; this approach to TAC management (and the potential for discarding) is monitored continuously. The further, annual review process that is undertaken at the ERFC, as detailed in the report, allows the fishery to meet SG100. The Assessment Team is confident the approach comprises the 'review' element, meets the requirement to seek lowest achievable levels, and is being implemented successfully. We have not changed the scoring.

PI	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
Pikeperch	N	N	N	SIa: as for perch SId: why should this be different to perch? Condition: The condition does not relate to the requirements of the CR in relation to reviews. This should be reconsidered.	SIa: As for perch. SId: Thank you for the comment. Measures and tools are typically reviewed regularly to manage the overall fishery in two separate UoCs of present MSC certification – one for perch and another for pike-perch, but it is not clear that all elements of the specific harvest strategy of the fishery are reviewed and improved, if necessary, and in particular the monitoring and control of recreational fishery of perch which can constitute a significant part of harvest of the species, especially in winter period. Therefore the perch fishery, unlike the pike-perch fishery, does not meet this SG100 requirement. Condition: Thank you for the comment. The client made a change to the CAP to indicate that feasible options to minimise discarding that are identified in the review in Year 3 are implemented as appropriate.
1.2.2 Perch	N	N	Y Note that PI score is 75, not 60.	SIa: Presumably, the most important issue is that the TAC should be reduced year-on year if the stock were determined to be declining to a level below an msy proxy. The question, as for PI1.1.1, is what is that proxy and how would TACs be adjusted if the stock continued to decline? This is	PI score: We note that the PI is scored 75, so we are not sure why this comment was made? SIa: Thank you for the comment. We have highlighted that fishing opportunities are calculated on an annual basis to take into account inter-annual

PI	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
				not clear. The next step is when would the fishery close, and is this point equivalent to a limit RP? SIc: The tools used (quotas, gear restrictions and closed areas/seasons) seem to be well enforced and effective with good evidence. May this be 100?	variability in estimated stock size (i.e. annual changes in *Ba*), which ensures that the exploitation is reduced as stock size declines. Also, the TAC is calculated on the commercially available biomass (*Ba*), not total stock biomass (*Btotal)*. The precautionary harvest strategy will thus always protect a proportion of the juvenile and more productive fish within the population (i.e. larger mature fish), allowing the stock to rebuild, if needed. SIc: It is agreed that the tools used are well-enfroced and effective, with good evidence, but the Assessment Team is more comfortable scoring at 80 on a precautionary basis.
Pikeperch	N	N	NA	As for perch except SIb – perch attracted a condition in part because discarding is uncertain; for pikeperch work is planned but is current information sufficient, especially given the condition for PI 1.2.1 and 1.2.4?	Please see the comments above for perch. The Assessment Team is content that the approach taken to addresing the level of uncertainty with pike-perch because, unlike perch, pike-perch is rarely taken in the recreational fishery. Further work is planned to get a better understanding of the pike-perch discarding, as noted. However, at present, the fishery deserves the passing score, here.
1.2.3 Perch	N	Y	NA	SIc: While not necessarily disagreeing with the	Thank you for the comments.

PI	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
				comments, which seem entirely reasonable, these contradict the text in PI 1.2.2 SIb and 1.2.4 SIc. The teams interpretation and scoring may need to be reconciled between these.	In PI 1.2.3 SIc, we have tried to reflect that the information on recreational catches is reasonable (surveys every 3-4 years) and the amount of IUU fishing has declined considerably in recent years (including through the introduction of VMS in 2015), such that the SG80 requirement (*There is good information on all other fishery removals from the stock*) is met. We believe there is no contradiction in this score and the fishery being scored down for PI 1.2.2 SIb (because there we are seeking more information on how any uncertainty in the estimates of recreational and IUU-related mortality is addressed) , and PI 1.2.4 SIc (because we'd like a clear explanation of the methodology employed to determine the amounts of recreational and IUU-related mortality that are applied in the assessment, annually).
Pikeperch	N	Y	NA	As for perch	Noted, thank you – please refer to the comment above for perch.
1.2.4 Perch	N	N	Y	SIb: This PI seems to chrystalise the issues with P1 – the relevance of the target reference point to msy and a strategy to keep the stock above	SIb: Thank you for the comment. We have edited the rationale to reflect that the stock assessments for all commercial fishes including perch and pike-perch estimate the total commercially available biomass

PI	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
				PRI, neither of which are demonstrated.	(*Ba*) on an annual basis. TACs are determined based on a principle of optimal removals suggested by Tiurin (1967), such that commercial fish mortality should not exceed the natural mortality coefficient (30%), and the TAC is set at slightly less than this value (20-25% *Ba*, which is equivalent to the TRP, with $F_{0.2\text{-}0.25} \leq M$ having the same intent as F_{MSY}), noting that this is precautionary because it is based on available biomass (Ba) rathe rather than total biomass (Btotal). This approach has been demonstrated to effectively keep the stock well above the point at which recruitment would be impaired, and is considered appropriate for the scale and intensity of the fishery.
Pikeperch	N	N	Y	As for perch.	Noted, thank you – please refer to the comment above for perch.
2.1.1	Y	N	NA	SIa: Do we know with a high degree of certainty that stocks are fluctuating around msy? This is the same issue as for P1. Also, the assessment of perch is different to that in P1.	SIa: Thank you for your comment. Given that the stocks of primary species are considered to be healthy (i.e., that there is no need to look at the alternative requirement at SG80 for stocks below the PRI), the requirement at SG80 is that "Main primary species are highly likely to be above the PRI". Stock status indicates clearly that this is the case for all

PI	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
				SIb: is ruff population increasing? Does the fishery take >30% of the total catch? If no and yes, then would this meet SG100?	main primary species. The requirement at SG100 is then that: "There is a high degree of certainty that main primary species are above the PRI and are fluctuating around a level consistent with MSY." Only bream is considered to meet this requirement, with stocks and yields at a high level and with abundant incoming year classes. Harvest data for the last five years comprise five of the top ten since 1931 (EMI 2017). Other main primary species were considered to not meet the SG100 requirement that "There is a high degree of certainty that main primary species … are fluctuating around a level consistent with MSY." Contrary to the reviewer's comment, the scoring for perch under 2.1.1, SIa (i.e., meeting SG80 but not meeting SG100), is consistent with the scoring in P1, because the SG100 requirement for PI 1.1.1 SIb is that "There is a high degree of certainty that the stock has been fluctuating around a level consistent with MSY"). Therefore, we have not adjusted the scoring. SIb: The Assessment team reviewed the latest Lake Peipus catch data (available here: https://www.agri.ee/et/eesmargid-tegevused/kalamajandus-ja-kutseline-

PI	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
					kalapuuk/puugiandmed). For 2016, the Estonian (Eesti) catch of ruffe (Kiisk) was 0.45 t, whereas the Russian (Venemaa) catch was 189.9 t. The text has been edited to show that Estonian fishing mortality is low, but it is also clear that the UoA does not hinder the recovery and rebuilding of ruffe, so SG100 is jusitifed.
2.1.2	Y	N	NA	SIe: There is no evidence of a review of 'alternative measures' to minimise unwanted catch; having measures such as mesh size restrictions and closed areas/seasons does not seem to automatically meet requirements to seek 'lowest achievable levels' (SA3.5.3.1). It is noted that discarding is reported in PI 1.2.2 SIb.	Thank you for your comments. As noted in the scoring commentary, there is annual consideration given to measures to reduce unwanted catch in the ERFC process. We have added examples of where measures are implemented to the text, including that in periods when there is a higher abundance of smaller pike-perch in the stock, the MLS for pike-perch caught in the seine fishery is reduced. Similarly, directed fishing for primary species is curtailed when approximately 90% of the quota is taken, leaving the rest for catches in other parts of the fishery, thereby minimising the potential for discarding. With regard to scale and intensity of the fishery, the Assessment Team is confident the approach taken meets the requirement to seek lowest achievable levels through regular review, and measures are

PI	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
					being implemented. We have not changed the scoring.
2.1.3	Y	Y	NA		No comments noted.
2.2.1	Y	Y	NA		No comments noted.
2.2.2	N	N	NA	While possibly not affecting the scoring, the prohibition on fishing near to the shore will keep the fishery away from most non-target species, also helped by closed areas and seasons. SIe: There is no evidence of a review of 'alternative measures' to minimise unwanted catch; having measures such as mesh size restrictions and closed areas/seasons does not seem to automatically meet requirements to seek 'lowest achievable levels' (SA3.5.3.1). It is noted that discarding is reported in PI 1.2.2 SIb.	Thank you for the comment. No change has been made as a result, though. SIe: As noted in the scoring comments for PI 2.2.2, there are no main secondary species, so SG80 is met by default. SG100 was previously confirmed as not being met.
2.2.3	Y	Y	NA		No comments noted.
2.3.1	Y	Y	NA	The scoring appears probably justified here, but should not the RBF have been used for the wels	Thank you for the comment supporting the score. We note that the criteria for using the default PIs for

PI	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
				and asp ETP species?	PI 2.3.1 is (Table 3, MSC 2014): "Can the impact of the fishery in assessment on ETP species be analytically determined?" We believe that the impact of the fishery on ETP species can be analytically determined, and so we did not use the RBF.
2.3.2	Y	Y	C5: Y C6: N	C6. The CAP does not actually include a 'review'; there should be at least one, with implementation of the results if appropriate. It may also be useful to include some aspects of the MSC requirements for regular reviews in the condition	Thank you for the comment. The client made a change to the CAP to indicate that feasible options to minimise impacts on ETP species that are identified in the review in Year 3 are implemented as appropriate.
2.3.3	Y	Y	Y		No comments noted.
2.4.1	N	Probably	NA	SIa: the recovery of the habitat within 5-20 years of cessation of fishing is entirely probable, but has not been demonstrated. Impacts of fishing have not been evaluated. Habitat is not classified according to the MSC required SGB categories. In this case, should the RBF have been used?	Thank you for the comment. We have added more detail on the habitat types to better reflect the SGB crtieria. We agree that habitat recovery is highly likely, and scored the fishery at SG80. We also agree that the recovery hasn't been demonstrated: We stated: "….the Assessment Team was not able to identify

PI	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
					any work that had considered the overall impact of fishing activities on Lake Peipus. In the absence of this type of evidence, SG100 is not met." Nevertheless, there is good information available on the habitats encountered and generally on the impact of static gears on these habitat types, such that the RBF is not needed.
2.4.2	Y	Y	NA		No comments noted.
2.4.3	Y	Y	NA	Notwithstanding comments on PI 2.4.1, the rationales appear sound, except perhaps that SIc does not include any active 'measurement' of changes.	Thank you for the comment. The Assessment Team agrees with this comment, and have rescored PI 2.4.3 SIc at 80. This adjusts the PI score from 95 to 85. The overall P2 score has also been adjusted.
2.5.1	Y	Y	NA		No comments noted.
2.5.2	Y	Y	NA		No comments noted.
2.5.3	Y	Y	NA		No comments noted.

PI	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
3.1.1	N	N	NA	SIb: given the importance of the ERFC, it seems that the dispute resolution process applicable to this aspect of management should also be considered?	SIb: Your point is well made, but we have considered the role of the ERFC in the fisheries-specific section of P3 (e.g. 3.2.x), rather than in the broader governance level on P3.1.1.
3.1.2	Y	Y	NA		No comments noted.
3.1.3	Y	Y	Y		No comments noted.
3.2.1	Y	Y	NA	Whilst scoring seems sound, the cumulative monitoring of short-term objectives seems likely to deliver the long-term objectives also?	Thank you for the comment. Indeed they are likely to contribute to the long-term objective, but in order to score higher the Assessment Team would like to see an intermittant, wholescale review of the long-term objectives of the ERFC to reflect wider changes in EST/RUS natural resource management policy
3.2.2	Y	Y	NA	Nb SIc: TACs may or may not be set at msy, although this would not necessarily change the scoring?	SIc: Thank you for the comment. As noted in the scoring for P1, TACs are set with respect to a proxy for F_{MSY}. A minor edit to the rationale has been made.
3.2.3	Y	Y	NA		No comments noted.

PI	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
3.2.4	Y	Y	NA		No comments noted.

Table 35 For reports using the Risk-Based Framework:

RBF was not used (Although see comment below)

Table 36 For reports assessing enhanced fisheries:

Enhancement does not take place.

Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary) can be added below and on additional pages

As both gill-nets and trap-nets are used to catch both species, should these be identified as separate UoAs?

- Assessment Team response: Thank you for the comment. The Assessment Team and CAB discussed this originally but felt the mode of operation and bycatch profiles for these static gears were sufficiently similar as to combine them. This is permitted under MSC definitions of UoAs (i.e., CR 7.4.7 allows UoAs to be defined on the basis of 'gear/s'.

Should the RBF have been used for the fish ETP species (wels and asp)?

- Assessment Team response: Thank you for the comment. As noted above, we were content to proceed without using the RBF on the basis that the criterion for using the standard tree was met.

The references to the relevant SIs in the condition summary do not tally.

- Assessment Team response: Thank you for the comment. We have rechecked and cannot see where the SIs do not tally. No changes have been made.

The section on traceability (5.2) would benefit from a short description of the situation into which fish are landed (the first point in the CoC), e.g. is fish landed directly to processing plants, or collected at the dockside by buyers?

- Assessment Team response: Thank you for the comment. An edit has been made to the traceability section to reflect that the fish are collected from the storage facilities of the fishing companies holding the fishing licences.

As the RBF was not used, it seems inappropriate to include any 'trial' PSA tables, especially as this is probably gear-specific in selectivity anyway?

- Assessment Team response: Thank you for the comment. We thought it useful to include the PSA table for context. Readers are reminded that it is not used in scoring. The selectivity may be gear specific but the categories are sufficiently large that the scores can be the same.

Appendix 7: Stakeholder submissions at the PCDR

1. The report shall include:

a. All written submissions made by stakeholders during consultation opportunities listed in FCR 7.15.4.1.

b. All written and a detailed summary of verbal submissions received during site visits regarding issues of concern material to the outcome of the assessment *(Reference FCR 7.15.4.2)*

c. Explicit responses from the team to stakeholder submissions included in line with above requirements *(Reference: FCR 7.15.4.3)*

(REQUIRED FOR FR AND PCR)

2. The report shall include all written submissions made by stakeholders about the public comment draft report in full, together with the explicit responses of the team to points raised in comments on the public comment draft report that identify:

a. Specifically what (if any) changes to scoring, rationales, or conditions have been made.

b. A substantiated justification for not making changes where stakeholders suggest changes but the team makes no change.

(Reference: FCR 7.15.5-7.15.6)

Appendix 8: Surveillance frequency

Table 37: Surveillance level rationale.

Year	Surveillance activity	Number of auditors	Rationale
1	To be determined	To be determined	To be determined

Table 38: Timing of surveillance audit.

Year	Anniversary date of certificate	Proposed date of surveillance audit	Rationale
1	To be determined	To be determined	Cannot be determined until certification is confirmed

Table 39: Fishery surveillance programme.

Surveillance Level	Year 1	Year 2	Year 3	Year 4
Level 6	On-site surveillance audit	On-site surveillance audit	On-site surveillance audit	On-site surveillance audit & re-certification site visit

Appendix 9: Objections process

(REQUIRED FOR THE PCR IN ASSESSMENTS WHERE AN OBJECTION WAS RAISED AND ACCEPTED BY AN INDEPENDENT ADJUDICATOR)

The report shall include all written decisions arising from an objection.

(Reference: FCR 7.19.1)