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Ozernaya River Sockeye Salmon Fishery

Final Report and Determination

August 3, 2017

AUTHORS:

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CLIENT DETAILS:

Vityaz-Avto Co Ltd and Delta Co Ltd
Kamchatka, Russia

MSC reference standards:

MSC Certification Requirements (CR) Version 2.0

CONTENTS

1 EXECUTIVE SUMMARY

An expedited audit of the Ozernaya Sockeye fishery was conducted in 2017 as a scope extension of the West Kamchatka certification, in lieu of a full reassessment. A scope extension was pursued because Ozernaya sockeye were due for recertification and the goal was to increase efficiency by combining this with the pink and chum salmon certification that was recently completed for the same fishing companies and area. The Vityaz-Avto/Delta salmon fishery throughout West Kamchatka was certified in 2016 and included pink and chum salmon in the Ozernaya River as well as pink, chum and coho salmon in several other West Kamchataka Rivers (MRAG Americas 2016b)

An assessment team of Ray Beamesderfer and Dmitry Lajus conducted the present assessment using CR v2.0 (1 October 2014), with modifications to the default assessment tree for salmon fisheries as defined by the Marine Stewardship Council (MSC). The units of assessment and certification included Sockeye Salmon spawning in the Ozernaya River of the West Coast of Kamchatka.

A site visit was conducted at the Vityaz Avto Company Offices and other offices in Petropavlovsk-Kamchatsky, Russian Federation on March 28 – March 30, 2017 (concurrent with the fourth annual Ozernaya Sockeye surveillance audit and first annual Vityaz-Avto/Delta surveillance audit). The team met with the clients, with the client's consultants, federal and state salmon scientific and management agencies, and key stakeholders. The team also reviewed extensive written documentation provided by the client and the fishery management system.

All Principle scores exceeded 80 and performance indicators scored between 80 and 100. As a result, no conditions were identified. On the basis of this assessment of the fishery the Assessment Team recommends that the fishery be recertified.

On this basis, MRAG Americas has determined that this fishery should be recertified, to be confirmed following the objection period.

Principle Level Scores

Principle 1 scores were based on this scope extension which was limited to this principle. Principle 2 and 3 scores were identified in the VA-Delta Kamchatka salmon certification (MRAG Americas 2016b) and apply to Ozernaya Sockeye as well.

Principle	Score
Principle 1 – Target Species (Ozernaya Sockeye)	97.9
Principle 2 – Ecosystem	85.7
Principle 3 – Management System	81.9

Summary of PI Level Scores

Prin-ciple	Wt (L1)	Component	Wt (L2)	PI No.	Performance Indicator (PI)	Wt (L3)	Weight in Principle	Score Sockeye
One	1	Outcome	0.333	1.1.1	Stock status	1	0.333	100
				1.1.2	Stock rebuilding	0	0.000	na
		Management	0.333	1.2.1	Harvest strategy	0.25	0.083	95
				1.2.2	Harvest control rules & tools	0.25	0.083	95
				1.2.3	Information & monitoring	0.25	0.083	90
				1.2.4	Assessment of stock status	0.25	0.083	95
		Enhancement	0.333	1.3.1	Enhancement outcome	0.333	0.111	100
				1.3.2	Enhancement management	0.333	0.111	100
				1.3.3	Enhancement information	0.333	0.111	100
Two	1	Retained species	0.2	2.1.1	Outcome	0.333	0.067	80
				2.1.2	Management	0.333	0.067	90
				2.1.3	Information	0.333	0.067	70
		Bycatch species	0.2	2.2.1	Outcome	0.333	0.067	100
				2.2.2	Management	0.333	0.067	80
				2.2.3	Information	0.333	0.067	80
		ETP species	0.2	2.3.1	Outcome	0.333	0.067	85
				2.3.2	Management	0.333	0.067	90
				2.3.3	Information	0.333	0.067	80
		Habitats	0.2	2.4.1	Outcome	0.333	0.067	95
				2.4.2	Management	0.333	0.067	95
				2.4.3	Information	0.333	0.067	80
		Ecosystem	0.2	2.5.1	Outcome	0.333	0.067	90
				2.5.2	Management	0.333	0.067	90
				2.5.3	Information	0.333	0.067	80
Three	1	Governance and policy	0.5	3.1.1	Legal & customary framework	0.3	0.150	100
				3.1.2	Consultation, roles &	0.3	0.150	85
				3.1.3	Long term objectives	0.3	0.150	80
		Fishery specific management system	0.5	3.2.1	Fishery specific objectives	0.25	0.125	80
				3.2.2	Decision making processes	0.25	0.125	75
				3.2.3	Compliance & enforcement	0.25	0.125	70
				3.2.4	Management performance	0.25	0.125	80

Summary of Conditions

No conditions are identified under Principle 1 in this scope extension of the VA-Delta Kamchatka salmon fishery to Ozernaya Sockeye. Ozernaya Sockeye are subject to conditions identified under Principles 2 and 3 for the VA-Delta Kamchatka salmon fishery (MRAG 2016b). The 2012 certification of Ozernaya Sockeye included nine conditions but all were closed during the first assessment (MRAG Americas 2017).

2 AUTHORSHIP AND PEER REVIEWERS

The assessment team consisted of the following individuals, who collectively have knowledge of the stock status and assessment, ecosystem impacts, and management systems applicable to this fishery:

2.1 Assessment Team

Mr. Ray Beamesderfer (Team Leader), M.Sc., Senior Fish Scientist, R2 Consultants, USA. Mr. Beamesderfer holds a bachelor's degree in Wildlife and Fisheries Biology from the University of California, Davis, and a Master's in Fishery Resources from the University of Idaho. Ray has special expertise in using quantitative analysis, statistics, and computer modeling to solve difficult fisheries-related questions, and in synthesizing and translating scientific analyses. He has completed a wide variety of projects in fishery management, biological assessment, and conservation/recovery planning. He is the author of numerous reports, biological assessments, management plans, and scientific articles on fish population dynamics, fish conservation, fishery, and hatchery management, sampling, and species interactions. Ray has served on MRAG and other fishery assessment teams for salmon fisheries in Alaska, Japan and Russia and brings perspective and harmonization between salmon fishery assessments in the Pacific.

Dr. Dmitry Lajus, Associate Professor in the Department of Ichthyology and Hydrobiology of St Petersburg State University. Dr. Lajus holds a BS and MS from St. Petersburg University, and a PhD from the Zoological Institute of the Russian Academy of Sciences. His research interests include population biology of marine fish and invertebrates, population phenogenetics, stress assessment, history of fisheries, historical ecology, and population dynamics. Dr. Lajus has authored numerous scientific articles, book chapters, and scientific reports, and conducted certification pre-assessments for a number of fisheries in Russia.

2.2 Peer Reviewers

MRAG appointed the following peer reviewer following an opportunity for public comment. The peer reviewer is considered the peer of the experts comprising the assessment team, and has the relevant expertise to review this Principle 1 scope extension.

Dr. Greg Ruggerone has investigated population dynamics, ecology, and management of Pacific salmon in Alaska and the Pacific Northwest since 1979. He was the Project Leader of the Alaska Salmon Program, University of Washington, from the mid-1980s to early 1990s where he was responsible for conducting and guiding research at the Chignik and Bristol Bay field stations, preparing salmon forecasts, and evaluating salmon management issues. Most of his research involves factors that affect survival of salmon in freshwater and marine habitats, including climate shifts, habitat degradation, predator-prey interactions, and hatchery/wild salmon interactions. He is currently a member of the Columbia River Independent Scientific Advisory Board and the Independent Scientific Review Panel. He recently served as the fish ecologist on the Secretary of Interior review of dam removal on the Klamath River. During the past six years, he has evaluated salmon fisheries for sustainability using guidelines developed by the Marine Stewardship Council.

3 DESCRIPTION OF THE FISHERY

3.1 Unit(s) of Assessment (UoA) and Scope of Certification Sought

3.1.1 UoA and Proposed Unit of Certification (UoC)

The MRAG Americas assessment team determined that the Ozernaya Sockeye Salmon fishery is within scope as required by the MSC. This fishery operated by Vityaz-Avto and Delta previously achieved MSC certification in September 2012 for the period through September 2017.

Table 1. The units of assessment and certification consist of:

Species	Sockeye Salmon *Oncorhynchus nerka*
Geographical range of fishing operations	Western Kamchatka, Sea of Okhotsk
Method of capture	Set (trap) nets, beach seines
Stock	Sockeye salmon spawning in the Ozernaya River on the Western coast of Kamchatka.
Management	Federal Agency for Fisheries SVTU, regional divisions of Federal Agency for Fisheries. Regional (Kamchatka) Fisheries Research Institute, KamchatNIRO. Regional (Russian Far East) Fisheries Research Institute, TINRO-Center. All-Russia Fisheries Research Institute, VNIRO. SevvostRybvod.
Client group	The clients for this assessment are: "Vityaz-Avto Co" Ltd and "Delta Co" Ltd Str. Stepnaya 5 Petropavlovsk-Kamchatsky, Russian Federation Contact: Mr. Andrei Bokov sergeikamchatka@mail.ru

3.1.2 Final UoC(s)

The final Unit of Certification is as proposed.

3.1.3 Total Allowable Catch and Catch Data

Table 2. TAC and Catch Data for the Ozernaya Sockeye Fishery

TAC	**Year**	**--**	**Not applicable[1]**	**--**
UoA share of TAC	**Year**	**--**	**Not applicable[1]**	**--**
UoC share of TAC	**Year**	**--**	**Not applicable[1]**	**--**
Total green weight catch by UoC	**Year (most recent)**	**2016**	**Ozernaya Sockeye**	**23,400 t**
	Year (2nd most recent)	**2015**	**Ozernaya Sockeye**	**20,273 t**

[1] TACs are not established for this fishery under the current "Olympic" style management system.

3.1.4 Scope of Assessment in Relation to Enhanced Fisheries

The fishery targets naturally reproducing salmon stocks returning to rivers within the certification unit. There are no hatcheries located within the proposed certification unit. Therefore, this is not considered an enhanced fishery.

3.1.5 Scope of Assessment in Relation to Introduced Species Based Fisheries (ISBF)

The fishery does not include introduced species or inseparable or practically inseparable (IPI) species.

3.2 Overview of the fishery

3.2.1 Fishery Area

The certification unit includes terminal fisheries operated in the Ozernaya River and nearshore marine waters near the river mouth at the Sea of Okhotsk in the Southwestern part of Kamchatka Peninsula (Augernot and Foley 2005). The Ozernaya River flows approximately 46 km from its origin in Kuril Lake. Kuril Lake is a large (77 km^2), deep (306 m maximum), crater lake. Kuril Lake and the upper portions of the Ozernaya River are located in a national wildlife preserve and the lake is also designated as a UNESCO world heritage site. The area is extremely remote. The watershed is largely undeveloped except for two small towns near the river mouth, Ozernovsky and Zaporozhie on left and right banks of the river, each consisting of about 2,500 residents.

3.2.2 Fishing Methods

The fishery is prosecuted with fixed trap nets in marine waters along the shoreline near the Ozernaya River mouth and with beach seines in the lower reaches of the river. Coastal trap nets typically consist of a mesh lead set perpendicular to shore to guide fish into one or more mesh wing-style traps where narrowing mesh fykes make it difficult for fish to exit. The mesh lead or "fence" is usually 1100-1300 m in length and 11-15 m deep at low tide. Beach seines about 200 m in length are fished in the shallow waters of the lower river.

Figure 1. Photos of fishing gear deployment: fish trap (upper) and beach seine (lower).

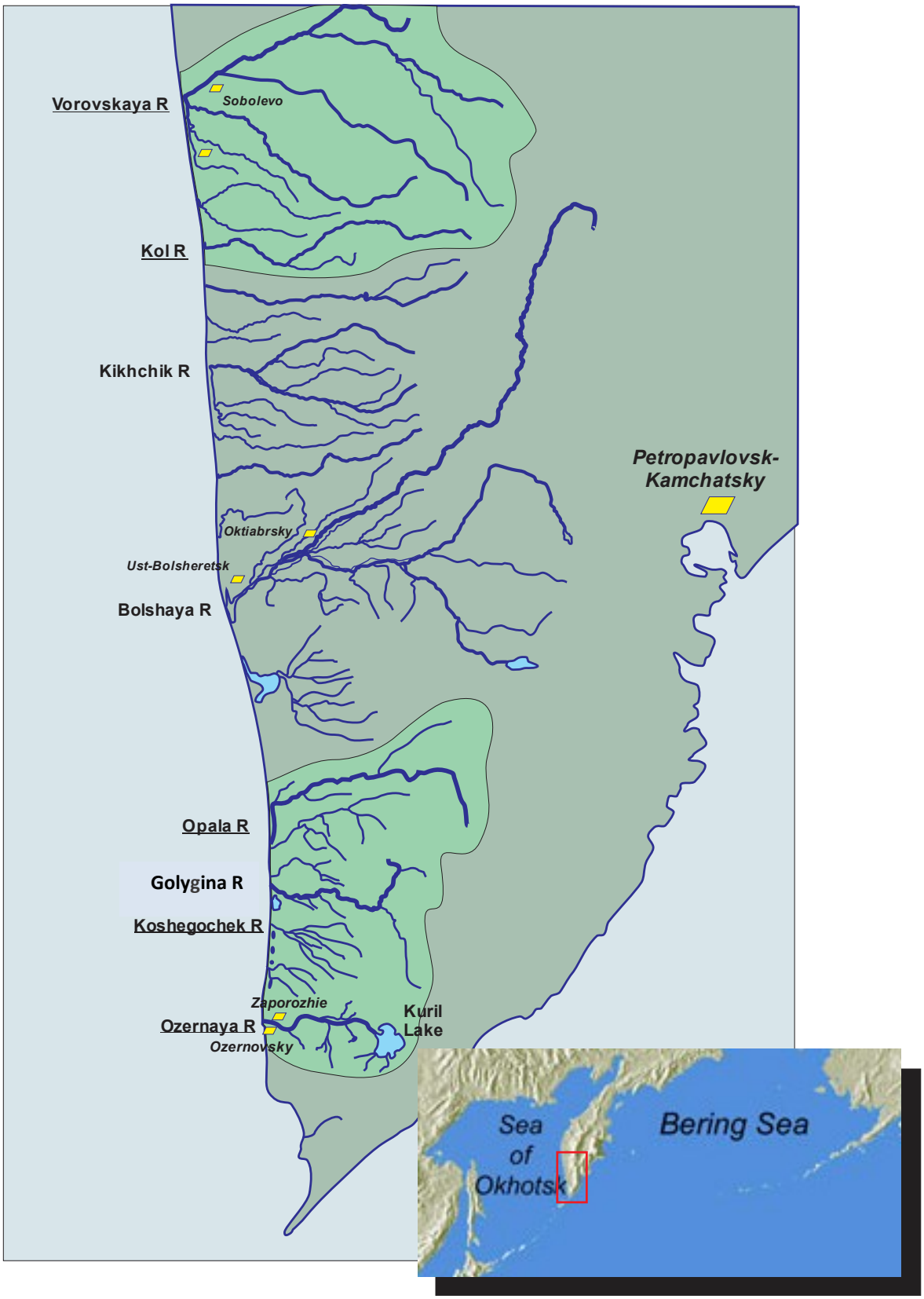

Figure 2. Ozernaya Sockeye Salmon fishing area addressed by this assessment in relation to the West Kamchatka assessment area (shaded in green).

3.2.3 Organization & User Rights

Vityaz-Avto was founded in 1997 and constructed new fish processing facilities in 2006 in Ozernovsky. The company also has two other branches in the Western coast of Kamchatka (in Oktiabrsky and Sobolevo towns). Most production is sold abroad, to Japan and Canada. Delta has worked in Kamchatka since 1998 and operates a modern fish processing facility with a capacity 170 mt per day are located in Ozernovsky town. More than half of total production is exported to Asian countries.

Vityaz-Avto leases nine fishing parcels in Ozernaya River area: six in the sea (189, 190, 191, 197, 203 and 204), and three in the river (746, 747, 752). Delta leases one sea fishing parcel (198) and one river parcel (755). The river parcels are used in all years because in-river fishing is simpler and cheaper than sea fishing. Not all sea parcels are used every year. In addition to Ozernaya River, the company fishes in other areas. Ozernaya salmon are processed at company plants located at the mouth of the Ozernaya River. Salmon including Sockeye from company fisheries on the Koshegochek River located 20 km to the north are also delivered by truck to the Ozernaya plant for processing. These salmon, which are not included in the unit of certification are processed, packaged, stored and tracked separately from Ozernaya Sockeye consistent with Chain of Custody requirements.

There are several other companies participating in fisheries in the Ozernaya river basin. The Sockeye catch of Vityaz-Avto and Delta has averaged 40% of total catch in the area since 2009. Other fishing companies using set nets and beach seines in the Ozernaya River area (mouth of the river and adjacent part of the sea) include: Ozernovsky RKZ N9 55 Ltd, Rybkholkam Ltd, RK Zapadnyi Ltd, Kolkhoz Krasnyi Truzhennik Ltd, I. P. Vazikov I. K., NIO Alyk Ltd, Kondor Ltd, I. P. Evdokimov S. I., SOI Khaiko, FGU Direktsia LRZ, Energostroy Ltd.

3.2.4 Seasons

The Sockeye fishery is typically conducted from July to early September with the bulk of the harvest occurring in late July and early August. The timing of peak fishing might vary over a several week period depending on annual differences in run timing.

Figure 3. Vacuum packing section of the Vityaz-Avto fish processing facility and an example of its production.

3.3 Principle One: Target Species Background

The Ozernaya system supports one of only two large Sockeye populations in Russia (the other being the Kamchatka River in eastern Kamchatka). Ozernaya Sockeye range up to 2000 km from their home river into the North Pacific (Birman and Konovalov 1968). Upon return to the Sea of Okhotsk, many fish migrate southward along the west coast of Kamchatka before entering the river (Bugaev 1983, 2002). Ozernaya Sockeye return to freshwater from late May to early September (Bugaev 1991, 1995, 2011; Bugaev et al. 2001, 2009). The peak of the run typically occurs in late July and early August. Adults generally return to spawn at 5 or 6 years of age after 2 or 3 years at sea. Spawning occurs predominately in the littoral zone of Kuril Lake at depths of 3 m or less (71%) and also in the upstream part of Ozernaya River (26%) and in lake tributaries (3%). Lake tributary spawners comprise the early portion of the run returning primarily in June and early July (Bugaev 1983; Konovalov 1971).

3.3.1 Abundance

Run size and escapement of Ozernaya Sockeye has been collected since 1940 (Figure 4) when the Pacific Institute for Fisheries and Oceanography established a research station and fish counting weir downstream from Kuril Lake (Bugaev 1991, 1995, 2011; Bugaev et al. 2001, 2009). In addition to counting fish which enter the Kuril Lake, regular observations of spawning grounds in the lake and inflowing rivers are also made. Annual estimates of juvenile abundance have begun to be made in recent years. Data are also collected on size, age and sex structure of commercial catches in the sea, mouth and source of river, survival of eggs, and distribution and feeding of juveniles.

Abundance of Ozernaya Sockeye is currently fluctuating about record high levels as a result of favorable ocean conditions and a reduction in unregulated Japanese driftnet fishing on the high seas in the early 1990s. Annual run size to the Ozernaya River and local fisheries has averaged over 10 million Sockeye per year over the last 10 years (Figure 5). Record high returns have occurred during this period (Table 3).

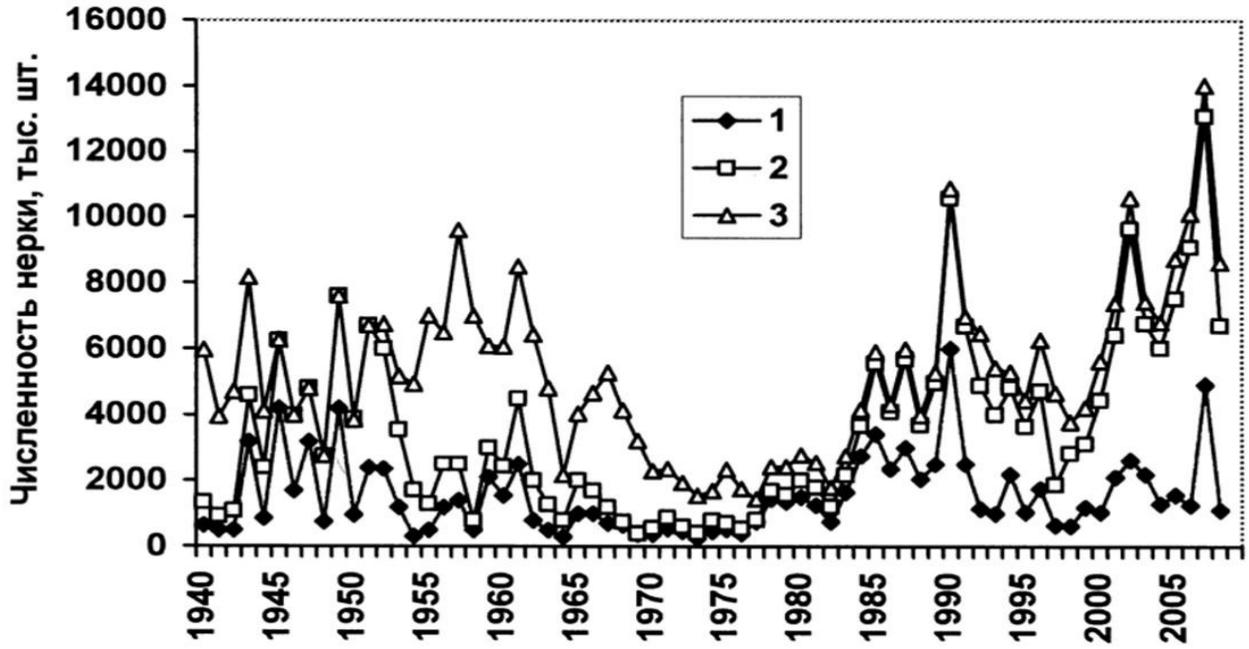

Figure 4. Ozernaya Sockeye abundance (millions), 1941-2010 (Dubynin et al. 2007; Antonov et al. 2007; Bugaev et al. 2009). 1=mature part of the stock, 2=fish approaching the shore, 3=spawners.

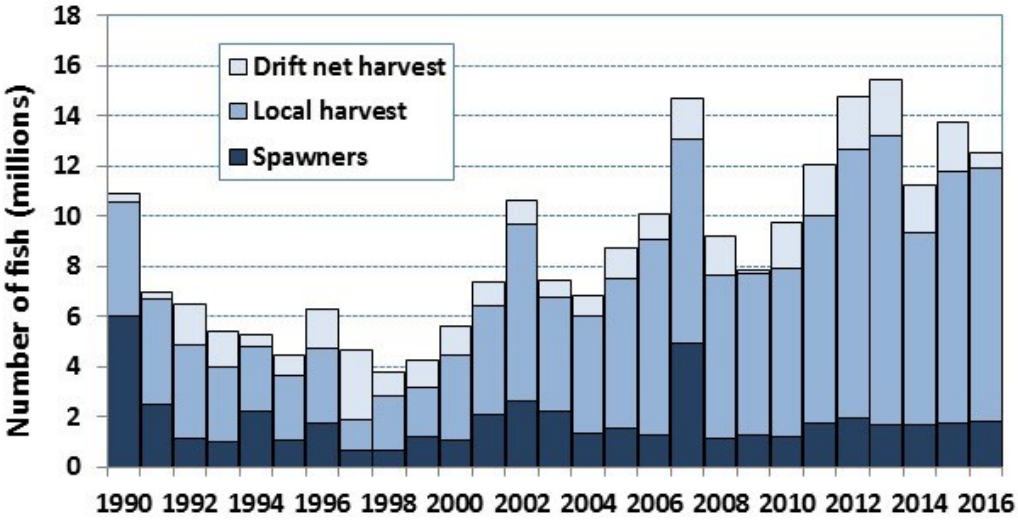

Figure 5. Abundance, harvest and escapement of Ozernaya Sockeye, 1990-2016.

Escapements are managed to produce maximum sustained yield based on production curves fit to spawner-recruit data. Current escapement goals are 1 to 2.3 million Sockeye as counted at the weir (1.5-1.9 million optimum). Escapement goals for the period 1970-1994 were 2.5-3.5 million (3 million optimum). Escapement goals have been consistently met or exceeded since the goal was reduced in 1994. A record escapement of 4.9 million Sockeye occurred in 2007 from an unanticipated large run coupled with late run timing. This escapement produced 2012-2013 returns that were substantially greater than predicted by the 1995-2002 spawner-recruit data which did not include data from escapements greater than 3 million.

At the fourth surveillance (MRAG Americas 2017), a summary report was provided from KamchatNIRO regarding recent research results which indicate that productivity of Kuril Lake was below average over the last 3-4 years. This resulted in a decrease in number and growth rate of juvenile Sockeye. The hypothesized cause was a limitation of phosphorus nutrients. A. Bugaev of KamchatNIRO (personal communication) advised that monitoring efforts are ongoing and changes in escapement goals may be considered if the current productivity trend continues. In addition, updated stock-recruitment data was requested as part of the Ozernaya Sockeye scope extension.

Figure 6. Photo of salmon counting weir in the Ozernaya River at the outlet of Kuril Lake.

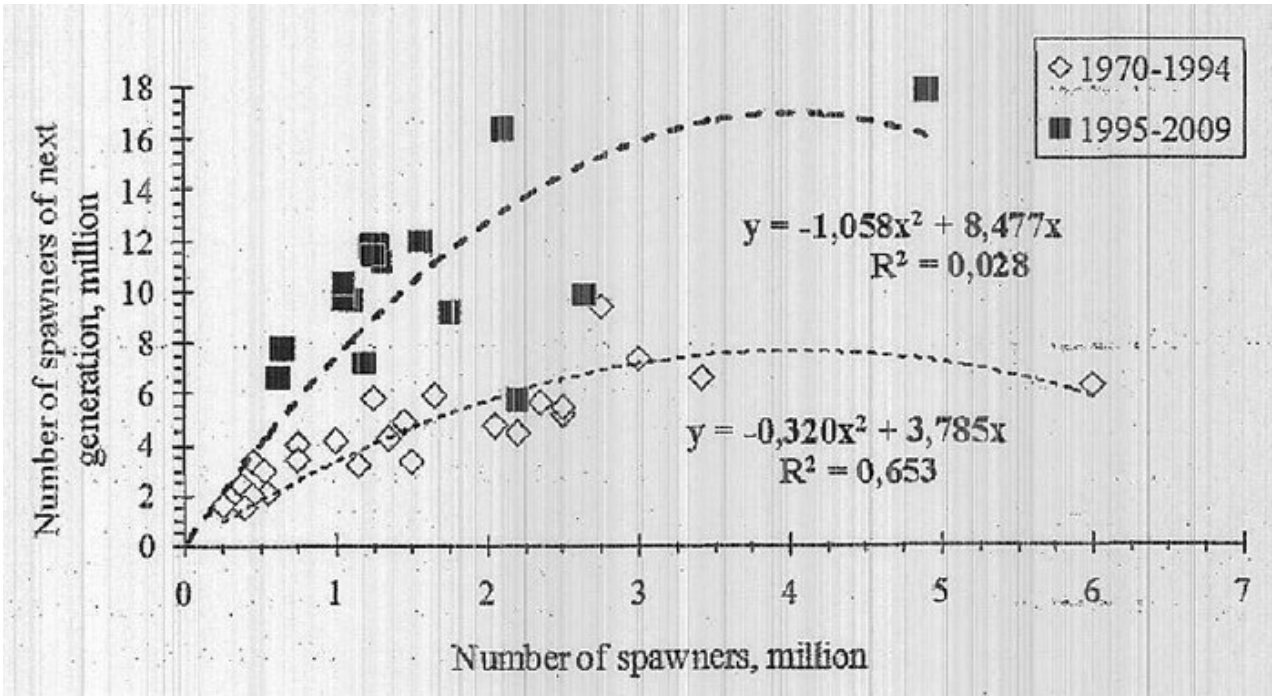

Figure 7. Spawner-recruit relationships for Ozernaya Sockeye (millions of fish) (updated from Bugaev et al. 2009 and KamchatNIRO 2017, unpublished).

Figure 8. Sockeye salmon spawning the river outlet of Kuril Lake (from Bugaev et al. 2009).

Table 3. Abundance of Ozernaya Sockeye, 1990-2016 (unpublished KamchatNIRO data).

	Abundance (thousands)			Harvest (thousands)			Exploitation rates		
Year	Ocean	Coast return	Spawners	Drift net	Coast	Total	Drift net	Local	Total
1990	10,883	10,583	6,000	300	4,583	4,883	3%	43%	45%
1991	6,979	6,679	2,500	300	4,179	4,479	4%	63%	64%
1992	6,477	4,883	1,150	1,594	3,733	5,327	25%	76%	82%
1993	5,408	4,005	1,000	1,403	3,005	4,408	26%	75%	82%
1994	5,282	4,818	2,200	464	2,618	3,082	9%	54%	58%
1995	4,448	3,648	1,050	800	2,598	3,398	18%	71%	76%
1996	6,258	4,728	1,750	1,530	2,978	4,508	24%	63%	72%
1997	4,654	1,870	650	2,784	1,220	4,004	60%	65%	86%
1998	3,778	2,842	620	936	2,222	3,158	25%	78%	84%
1999	4,217	3,163	1,190	1,054	1,973	3,027	25%	62%	72%
2000	5,625	4,450	1,050	1,175	3,400	4,575	21%	76%	81%
2001	7,398	6,421	2,110	977	4,311	5,288	13%	67%	71%
2002	10,598	9,650	2,635	948	7,015	7,963	9%	73%	75%
2003	7,433	6,764	2,200	669	4,564	5,233	9%	61%	70%
2004	6,806	6,016	1,300	790	4,716	5,506	12%	69%	81%
2005	8,726	7,520	1,565	1,206	5,955	7,161	14%	68%	82%
2006	10,111	9,088	1,250	1,023	7,838	8,861	10%	78%	88%
2007	14,667	13,073	4,910	1,594	8,163	9,757	11%	56%	67%
2008	9,229	7,633	1,114	1,596	6,519	8,115	17%	71%	88%
2009	7,862	7,697	1,255	165	6,442	6,607	2%	82%	84%
2010	9,719	7,899	1,200	1,820	6,699	8,519	19%	69%	88%
2011	12,062	10,020	1,730	2,042	8,290	10,332	17%	69%	86%
2012	14,783	12,660	1,972	2,123	10,688	12,811	14%	72%	87%
2013	15,432	13,182	1,681	2,250	11,501	11,236	15%	75%	89%
2014	11,263	9,320	1,650	1,943	7,670	8,639	17%	68%	85%
2015	13,765	11,755	1,750	2,010	10,005	12,015	15%	73%	87%
2016	12,524	11,936	1,826	588	10,110	12,015	5%	81%	85%
Avg. (all)	*8,755*	*7,322*	*1,826*	*1,262*	*5,666*	*6,848*	*16%*	*69%*	*78%*
Avg. 10-yr	*12,131*	*10,233*	*1,851*	*1,613*	*8,609*	*10,005*	*13%*	*71%*	*85%*

3.3.2 Harvest

Recent 10-year annual harvest of Ozernaya Sockeye in terminal marine and river fisheries has averaged about 8.6 million fish per year (about 19 thousand metric tons). Harvest in coastal trapnets and river parcels exceeded 10 million Ozernaya Sockeye in four of five years from 2012-2016. Ozernaya Sockeye are estimated to account for 50% of the coastal marine trapnet harvest near the Bolshaya River, 90% near the Opala, and almost 100% south of the Koshegochek Rivers. Another 1.7 million are harvested on average in marine drift net fisheries in the Russian exclusive economic zone although this fishery was closed in 2016.[1] Corresponding annual exploitation rates of Ozernaya Sockeye currently average about 84%. These rates equal or exceed the highest exploitation rates documented for any Pacific Sockeye population.

Harvest by the fishing companies, Vityaz-Avto and Delta, currently averages about 9.6 thousand metric tons of Sockeye per year (Table 3). This typically comprises just under half of the total harvest of Ozernaya Sockeye in terminal fisheries. The majority of the Sockeye harvest by these two companies occurs in the river and a relatively small portion occurs in the sea nets.

3.3.3 Annual Management

Harvest is regulated by passing days in the river and closed seasons or net number limitations in the sea. The normal pattern of passing days, which are set up in the beginning of the season, is 2 open and 2 closed. This schedule may be modified in-season by the Anadromous Fish Commission based on spawning escapement information provided by KamchatNIRO (Figure 9). The number of passing days was reduced in 2013 and 2015 to avoid exceeding the escapement goal. However, in 2015 the fishing companies voluntarily stopped fishing on five open fishing days in August to allow employees to rest (Semenov et al. 2016).

3.3.4 Illegal or Unreported Harvest

Illegal or Unreported harvest is a chronic concern for salmon fisheries throughout Kamchatka (Clark 2007; Clarke et al. 2009; Dronova and Spiridonov 2008; Maksimov and Lehman 2008; Zaphorets et al. 2007a, 2007b). However, the incidence of illegal fishing is reported to be negligible in the Ozernaya system due to its remote location and active enforcement activities funded by the local and regional government as well as the fishing companies. Recent use of set gillnets has reportedly expanded in some areas of west Kamchatka, primarily from the Bolshaya River north. This fishery occurs in years of subdominate pink salmon runs when sea trap nets are not fished and some fishing companies sublease their fishing parcels to local fishermen. A portion of the associated catch may be sold to the fishing company but portions may also be diverted to the illegal, unreported markets. Neither Vitaz-Avto or Delta engage in the sublease of their fishing parcels.

While the high seas drift gillnet salmon fishery in the Russian exclusive economic zone was closed effective 1 January 2016, a limited amount of gillnet fishing is still permitted in nearshore areas of the Kuril Straits with nets attached to boats using permits for coastal gillnet fishing and arguing that these nets were torn away from the shore. Apparently, some portion of this fishery continues to operate illegally by fishing drift gillnets under the guise of set gillnets. Enforcement activities are reportedly underway.7

[1] *Future returns of Ozernaya sockeye are expected to increase due to closure of portions of the high seas drift gillnet fishery in the Russian Exclusive Economic Zone beginning 1 January 2016. (The 2016 surveillance erroneously reported that this fishery was closed during 2015.) This fishery included Russian vessels based on Sakhalin and Japanese vessels licensed to operate in Russian waters.*

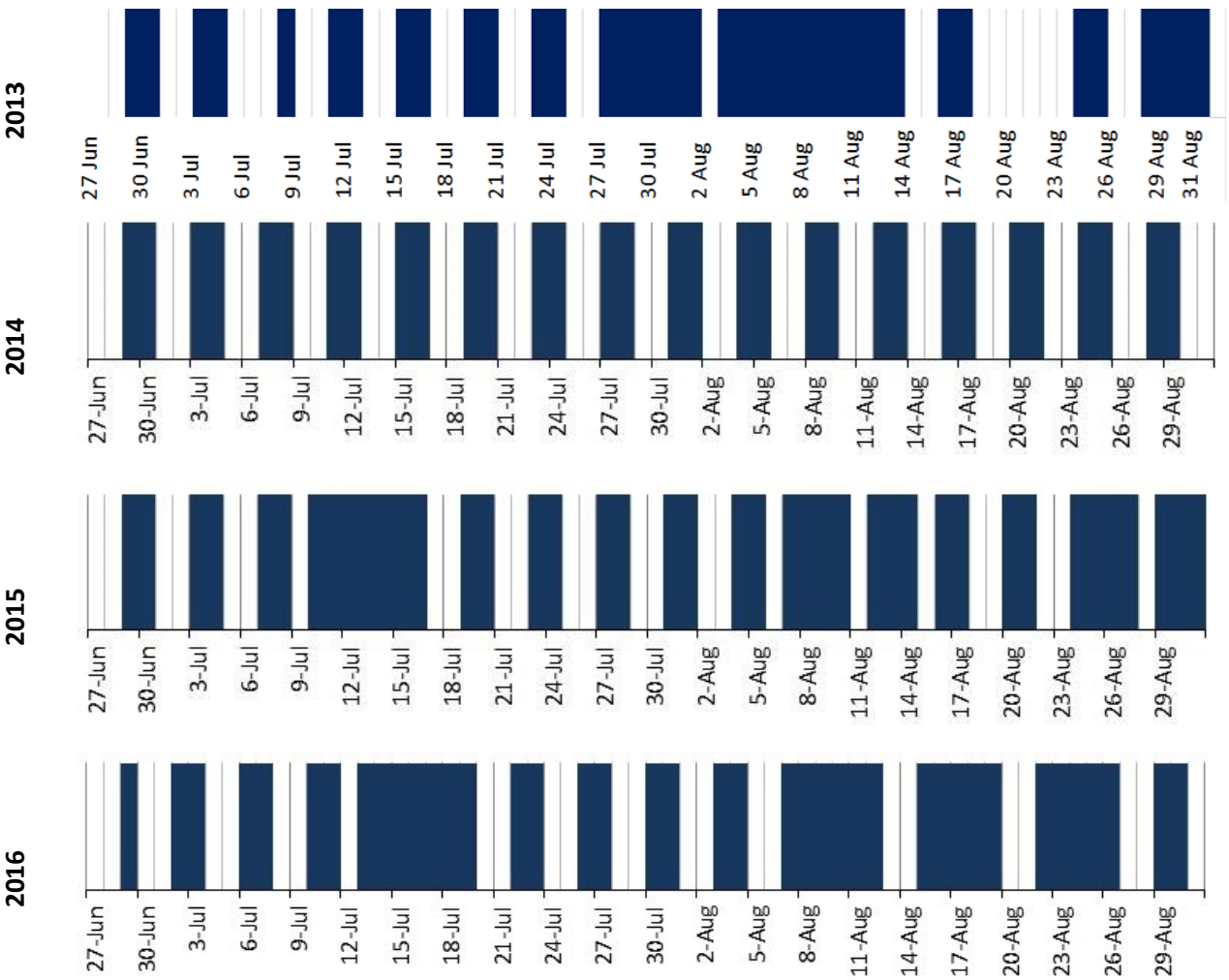

Figure 9. Pattern of passing days for Ozernaya fishery in 2013-2016 (fishing days are indicated by solid bars).

Table 4. Annual catch (metric tons) of Sockeye by the client companies in Ozernaya fisheries.

	OOO Vityaz-Avto			OOO Delta			Combined			Fishery	
	Sea Nets	River	Total	Sea Nets	River	Total	Sea Nets	River	Total	Total	Share
2004			1,372			1,372			2,744	10,087	0.27
2005			2,217			1,742			3,959	16,924	0.23
2006			2,055			2,145			4,200	16,842	0.25
2007			2,465			2,212			4,677	19,545	0.24
2008			3,066			1,989			5,055	15,684	0.32
2009	800	3,040	3,840	510	1,603	2,113	1,310	4,643	5,953	13,532	0.44
2010	1,092	2,311	3,403	356	2,207	2,563	1,448	4,518	5,966	15,521	0.38
2011	400	3,885	4,285	177	1,918	2,095	577	5,803	6,380	17,808	0.36
2012	866	6,034	6,900	191	2,896	3,087	1,057	8,930	9,986	25,000[a]	0.40[a]
2013	3,688	5,709	9,398	882	2,894	3,776	4,571	8,603	13,173	27,000[a]	0.49[a]
2014	1,888	4,373	6,261	333	1,091	1,425	2,221	5,464	7,685	16,344	0.47
2015	3,042	4,693	7,734	701	906	1,607	3,743	5,599	9,341	20,273	0.46
2016	3,675	2,240	5,915	814	1,289	2,103	4,489	3,529	8,017	23,400 [a]	0.34
5-yr Avg.	2,632	4,610	7,241	584	1,815	2,399	3,216	6,425	9,641	21,903	0.46

[a] *approximate estimate based on total catch and average annual weight per fish.*

3.4 Principle Two: Ecosystem Background

Information on Principle 2 components are summarized below and described in detail in the West Kamchatka salmon fishery assessment (MRAG 2016). Principle 2 is in common between the Ozernaya Sockeye and West Kamchatka salmon fisheries.

3.4.1 Primary Species

For the purposes of this assessment, primary species in the catch are defined as those not included under Principle I in the Unit of Assessment but subject to management tools and measures intended to achieve stock management objectives reflected in either target or limit reference points. In the Ozernaya Sockeye fishery, primary harvested species addressed by this assessment include coho and Chinook salmon. Coho in the commercial catch are retained, processed and sold. Chinook are not subject to commercial fishing or sale but small numbers may occasionally be caught during early season fisheries. Pink and Chum salmon harvested by the Ozernaya commercial salmon fishery are Principle 1 species in the West Kamchatka certification to which Ozernaya Sockeye are being added.

All fish delivered to the plants for processing are weighed and numbers are reported to the management agencies. Non-Sockeye retained species typically average 6% of the total catch by weight for 2001-2010. Pink salmon comprise the majority of the non-Sockeye total. Similar patterns were observed in 2012-2016 fisheries by Delta and Vityaz-Avto (Table 5). Small numbers of marine species including flatfish and sculpin caught in coastal trap nets might also be retained and processed.

In 2014, KamchatNIRO provided a summary and discussion of annual retained species data since 1991 (Shevlyakov et al. 2013). These included pink salmon, chum salmon, coho salmon, and char. Chinook salmon comes into the Ozernaya singularly and is not important for marketing. Catch patterns of other retained species have been observed to vary from year to year with no obvious long term trend, apart from the even-odd year pink salmon return cycle.

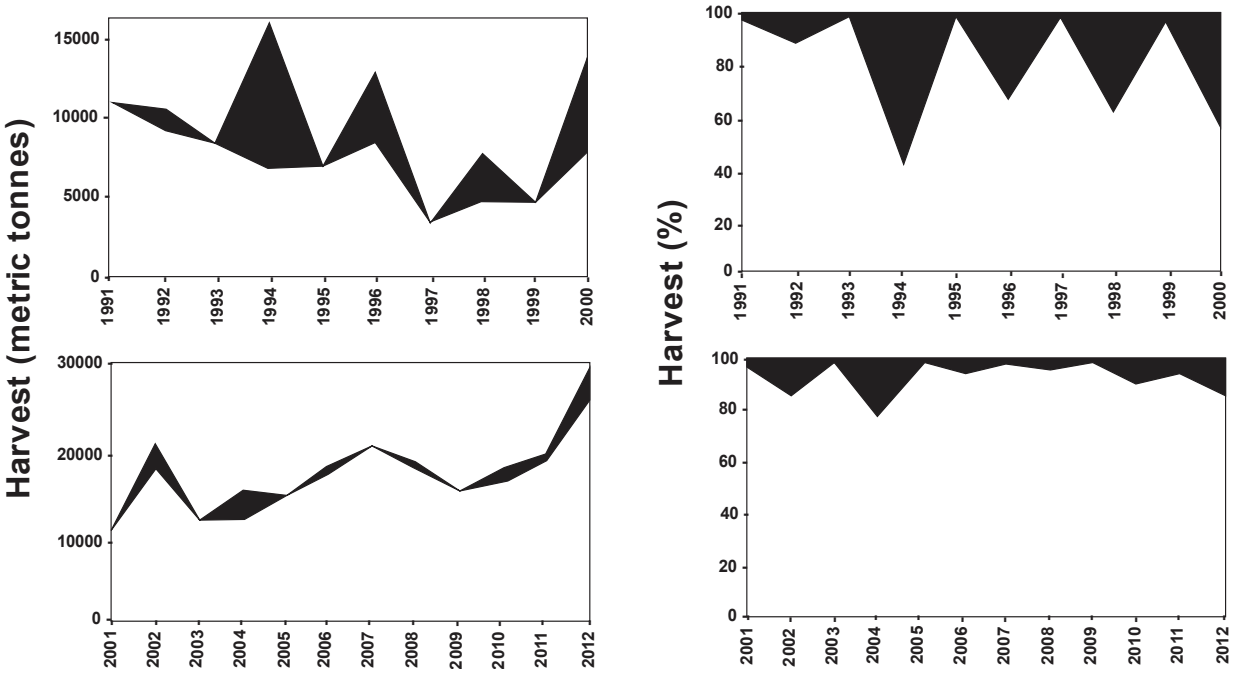

Figure 10. Relative harvest (mt on left, percentage on right) of Sockeye and other species (pink salmon, chum salmon, coho salmon, and char) in the Ozernaya Sockeye fishery.

Table 5. Harvest (mt) by client companies of all retained species in the Ozernaya Sockeye fishery.

Year	Company	Location	Sockeye	Pink	Chum	Coho	Char
2012	Delta	River	2,896.1	669.2	34.1	0.0	11.7
		Sea	190.7	332.2	15.9	0.0	1.7
	V-A	River	6,033.6	981.2	119.0	2.5	0.2
		Sea	866.0	2,138.3	125.4	2.0	9.0
	Total	River	8,929.7	1,650.3	153.1	2.5	11.9
		Sea	1,056.7	2,470.5	141.3	2.0	10.6
		Total	9,986.4	4,120.9	294.4	4.5	22.5
		% by species	69%	29%	2%	0%	0%
2013	V-A	River	5,709.0	14.2	169.14	74.58	0
		Sea	3,688.5	94.2	118.7	0	13.5
	Delta	River	2,893.6	13.9	11.2	0.0	8.0
		Sea	882.2	15.0	34.4	0.0	27.0
	Total	River	8,602.6	28.1	180.3	74.6	8.0
		Sea	4,570.7	109.2	153.1	0.0	40.5
		Total	13,173.3	137.3	333.4	74.6	48.5
		% by species	96%	1%	2%	1%	0%
2014	V-A	River	4,373.0	78.4	424.9	35.44	4.7
		Sea	1,887.5	110.0	82.6	0.00	6.0
	Delta	River	1,091.4	5.1	3.8	0.00	5.7
		Sea	333.4	2.8	4.2	0.00	2.6
	Total	River	5,464.4	83.5	428.7	35.44	10.4
		Sea	2,220.9	112.8	86.7	0.00	8.65
		Total	7685.3	196.4	515.4	35.44	19.0
		% by species	91%	2%	6%	0%	0%
2015	V-A	River	4,692.5	40.1	414.1	109.2	1.0
		Sea	3,041.8	133.8	1045.0	1.0	12.3
	Delta	River	906.1	17.2	10.0	0.0	7.4
		Sea	700.8	13.1	4.7	0.0	10.1
	Total	River	5,598.6	57.3	424.1	109.2	8.4
		Sea	3,742.6	146.9	109.7	1.0	22.3
		Total	9,341.2	204.2	533.7	110.2	30.7
		% by species	91%	2%	5%	1%	0%
2016	V-A	River	2,240.2	136.3	77.0	22.2	3.9
		Sea	3,674.5	795.2	124.5	0.0	7.3
	Delta	River	1,288.6	43.0	9.0	0.0	7.1
		Sea	814.0	37.0	11.0	0.0	6.7
	Total	River	3,528.8	179.3	86.0	22.2	11.0
		Sea	4,488.5	832.2	135.5	0.0	14.0
		Total	8,017.3	1,011.5	221.5	22.2	24.9
		% by species	86%	11%	2%	0%	0%

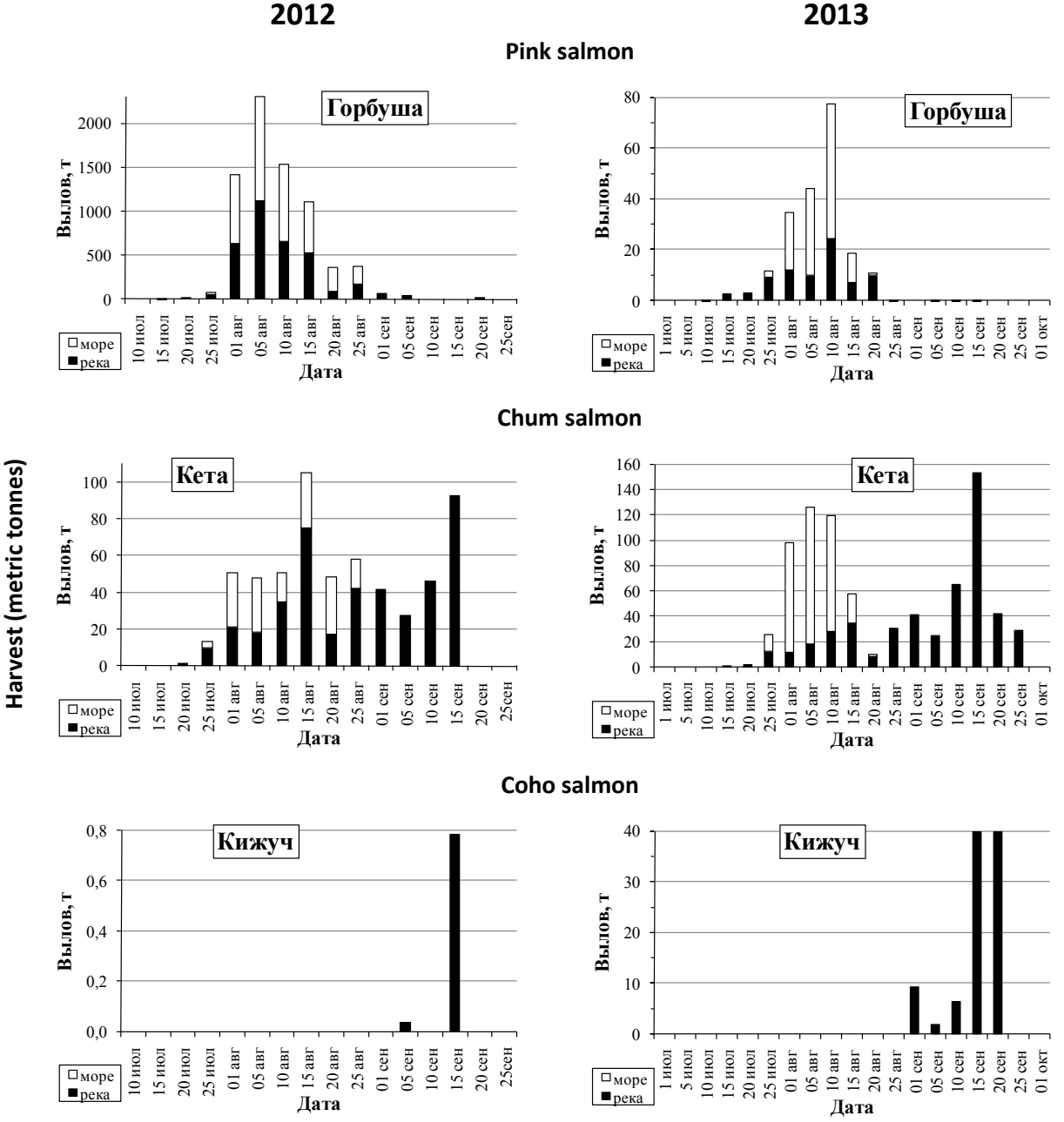

Figure 11. Salmon harvest in the Ozernaya River by five-day period (□ Sea, ■ River).

Information on the status of coho salmon was provided by KamchatNIRO for the second surveillance audit and updated by the third as part of the western Kamchatka salmon assessment (Shevlyakov et al. 2013a, 2013b, 2014). Additional information on abundance, escapement, harvest and biological characteristics of pink, chum, coho and char in the Ozernaya River was provided by KamchatNIRO in Shevlyakov et al. 2016 which was reviewed for the third surveillance. This report included an extensive analysis of trends in abundance and harvest by species relative to escapement reference points based on historical production data.

Harvest of coho salmon are currently at historically high levels throughout western Kamchatka (Figure 12). Earlier numbers were undoubtedly deflated by inaccurate catch reporting but numbers

since implementation of the Olympic fishing system in 2008 are accurate (Shevlyakov et al. 2013a, 2013b, 2014, 2016). Spawning escapements of Ozernaya chum and coho salmon are estimated based on aerial surveys although survey effort has been reduced by recent budget constraints in KamchatNIRO (Figure 13, Figure 14). While recent escapement estimates of have been relatively low, the management system believes these numbers are substantial underestimates due to a reduced frequency of aerial surveys.

Recent high returns from these brood years have been taken as an indication of continuing strong production of both chum and coho throughout western Kamchatka. Pink salmon are also abundant in west Kamchatka although run size is variable. West Kamchatka pink salmon are currently even-year dominant. The 2014 pink salmon run was anomalously low in relation to recent averages for the dominant year cycle. However, the 2015 subdominant run was relatively strong and the 2016 run was substantially improved relative to 2014.

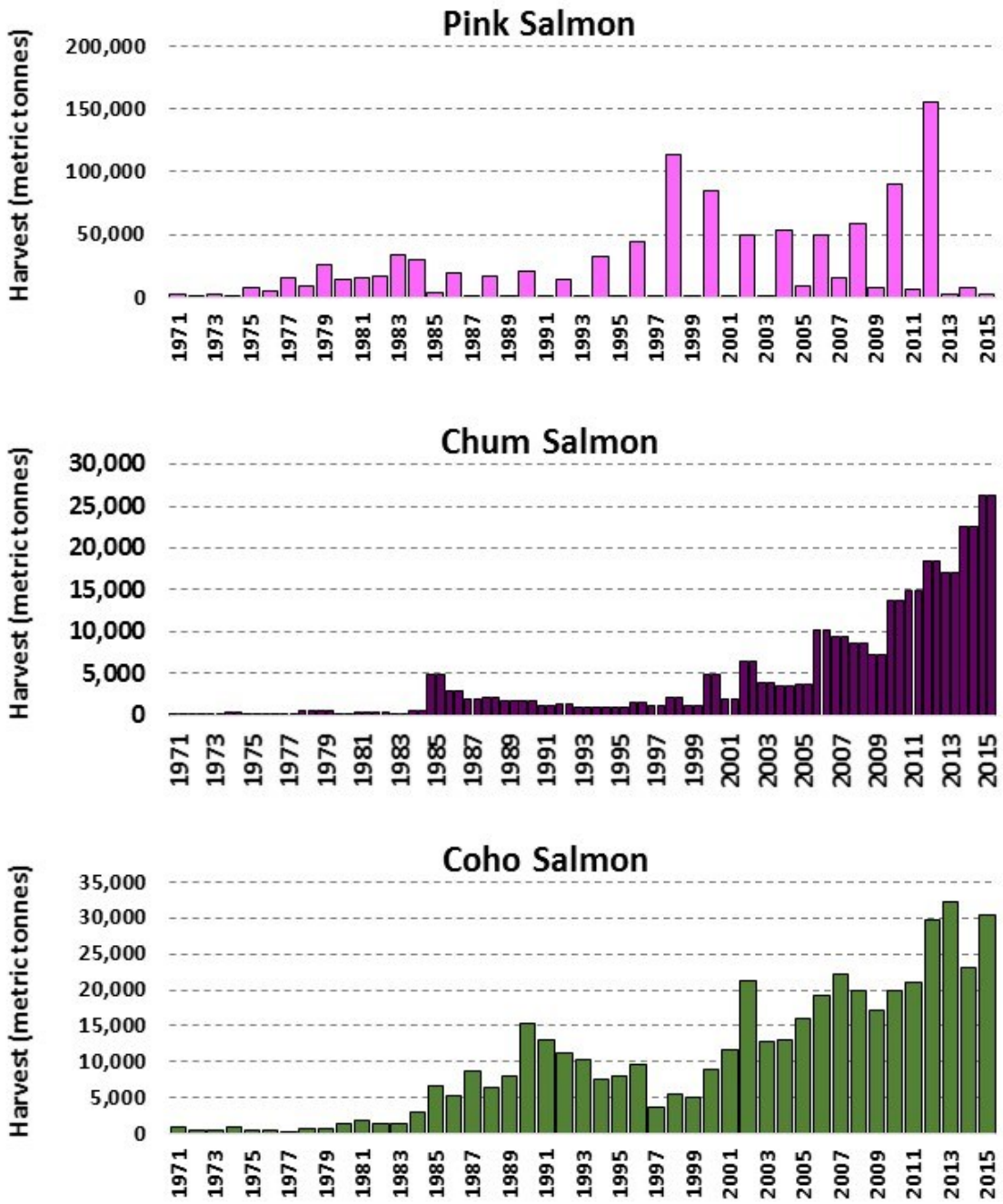

Figure 12. Total harvest (metric tonnes) of Pacific salmon in the Western Kamchatka area, 1993-2015.

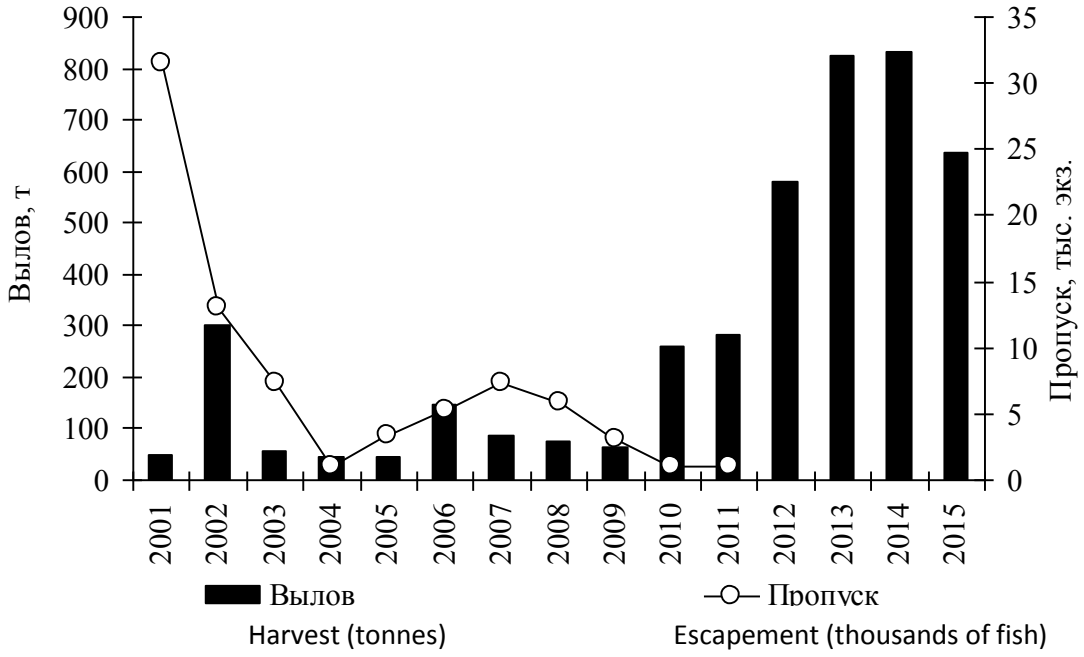

Figure 13. Harvest and escapement of chum salmon in the Ozernaya River, 2001-2015 (Shevlyakov et al. 2016).

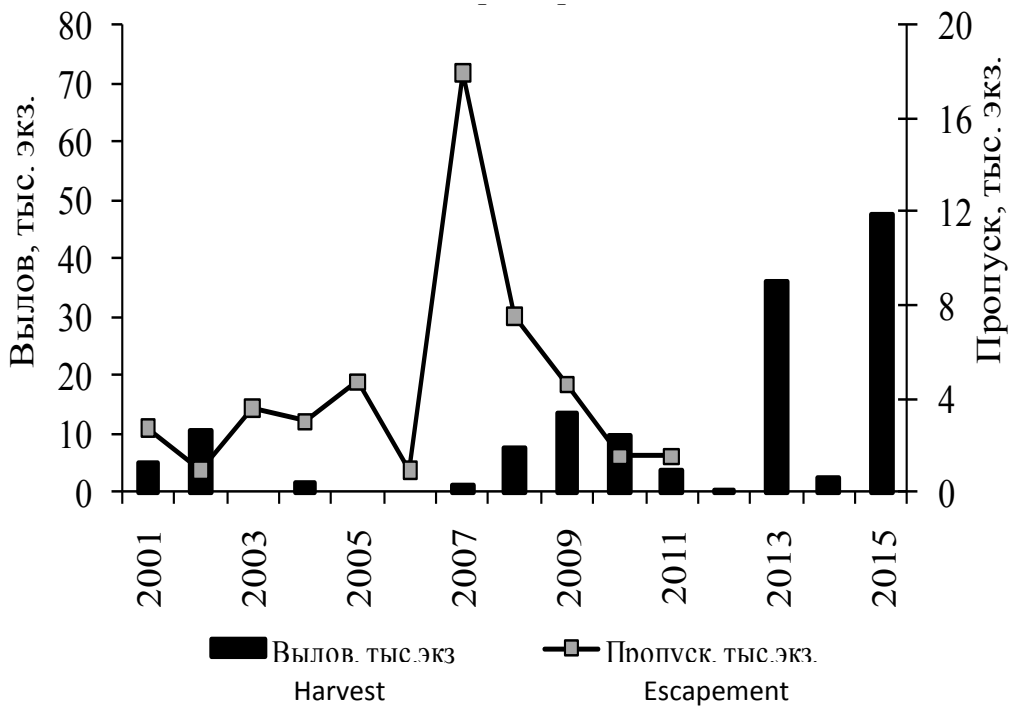

Figure 14. Harvest and escapement of coho salmon (thousands of fish) in the Ozernaya River, 2001-2015 (Shevlyakov et al. 2016).

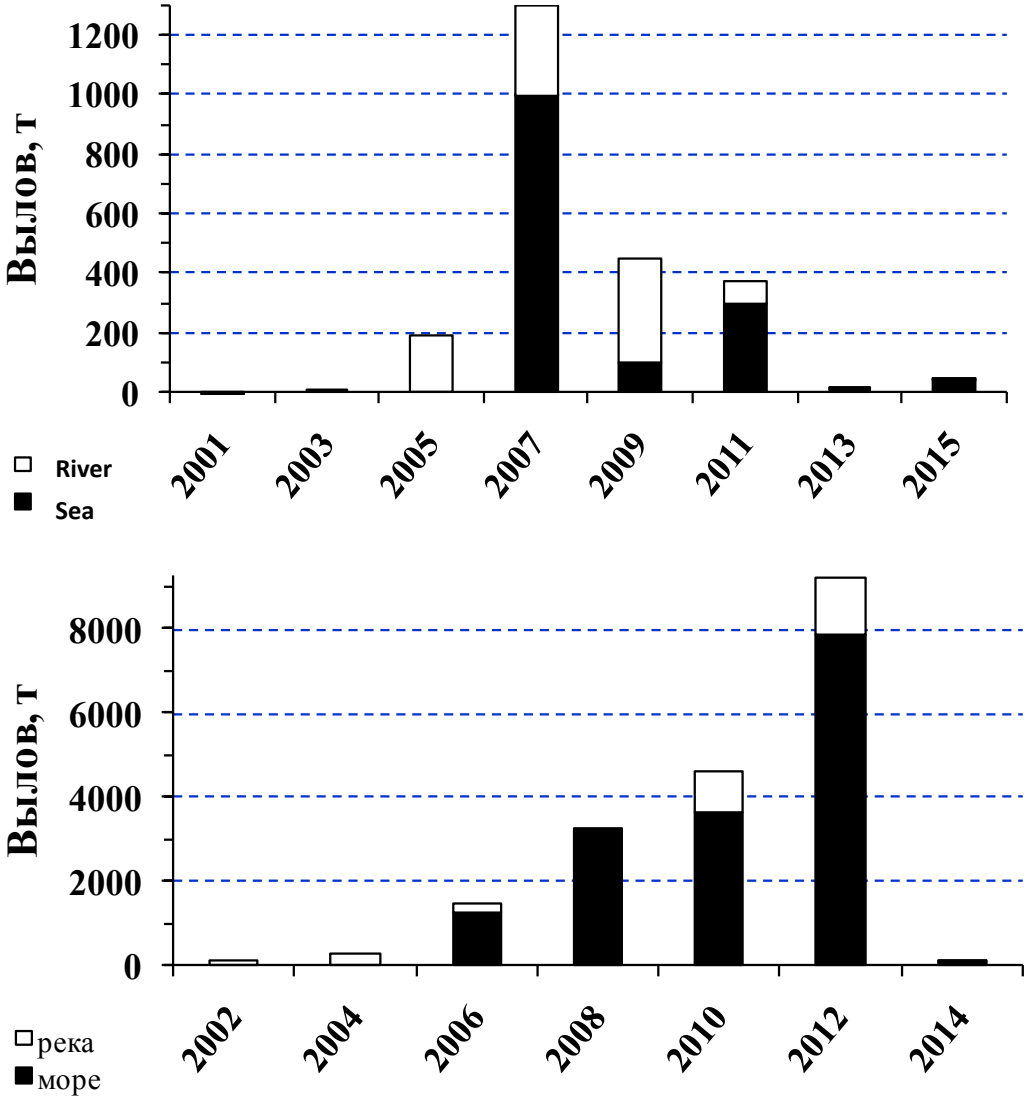

Figure 15. Total commercial harvest of pink salmon (tonnes) from the Ozernaya River in odd and even years, 2001-2015. River harvest is depicted in white. Marine harvest is depicted in black.

Escapement objectives are identified by the management system for aggregate Western Kamchatka stocks of chum, coho and pink salmon based on historical production patterns and stock-recruitment relationships (Shevlyakov 2016). Regional fisheries are regulated to ensure that significant escapements are distributed among individual rivers but each river is not managed to achieve a river-specific goal as long as the aggregate goal is being achieved. Thus, some rivers are fished at higher rates and some at lower rates but MSY-based goals are generally achieved in aggregate. Recent work by KamchatNIRO has developed river-specific reference points based on stock-recruitment analysis.

3.4.2 Secondary Species

For the purposes of this assessment, secondary species in the catch are defined as those not included under Principle I in the Unit of Assessment and not identified as primary. These include both retained and nonretained catch. Retained secondary species in this fishery predominately include char which are harvested in significant numbers for commercial use. Non-retained catch includes a variety of species, none of which comprise a significant volume of catch. There are no main secondary species.

Retained species include those which provide a commercial value significant enough to warrant processing and sale (and thus an economic incentive for capture). All retained fish delivered to the plants for processing and sale are weighed and numbers are reported to the management agencies. Information about retained species is collected by fisheries inspection and research institute.

Other species that are not typically processed for commercial value are treated as bycatch. Some bycatch species are released at fishing sites and additional sorting occurs at the processing plants. By-catch of non-retained species comprises a negligible portion of the harvest in the fishery. Due to the very low percentage of bycatch relative to the total fishery, no 'main' bycatch species are identified. Bycatch can include a variety of marine and freshwater species including codfish (Gadidae), flatfish (*Platichthysstellatus* sp.), smelt (*Osmerus* sp.), sculpins (*Cottus* sp.) and jellyfish (Blikshteyn 2011; Semanov et al. 2016). Bycatch species are abundant within the habitat boundaries and incidental levels of harvest in salmon fisheries pose no danger to bycatch species (Shevlyakov et al. 2016).

Trap nets and seines employed in this fishery generally keep the entire catch of all target and non-target species alive until it gets loaded into boats or trucks for delivery to the processor. When possible, most of flatfish and other non-retained species are sorted out directly to the sea and released alive. Particularly in marine trapnets, fishers might brail only commercially-important species, while leaving more bottom-oriented bycatch species (like flatfish) behind until they are ready to empty the net completely. Low numbers of small-sized bycatch species might become gilled in trapnet mesh until the traps are pulled; these fish are eaten by scavengers, or the fish decompose. A quantitative bycatch sampling program was implemented in 2011 at the Vityaz-Avto processing plant confirmed very low levels of bycatch in this fishery (Blikshteyn 2011). The numbers of any given species fall well below the MSC standards of 5% to 20% used to distinguish main or target species. All bycatch species except the larger flatfish are typically discarded during catch processing.

3.4.3 ETP Species

For the purposes of this assessment, endangered, threatened, or protected species are those that are recognized by national legislation, binding international agreements (e.g., CITES) to which jurisdictions controlling the fishery under assessment are party, or 'out-of scope' species (amphibians, reptiles, birds and mammals) that are listed in the IUCN Redlist as vulnerable (VU), endangered (EN) or critically endangered (CE). In this case, national legislation provides for protection of ETP species identified in the Russian Federation Red Data Book, also known simply as the Red Book. The Red Book is based largely on the International Union for Protection of Nature and Natural Resources (IUCN), which formally designates protected species subject to enhanced regulatory protection. Related natural conservation legislation was adopted in 1980s-1990s including laws for protection of natural environment and fauna, natural (wildlife) areas under special protection, ecological expertise along with a number of various decrees by the Russian Federation Government. These regulations established conservation priorities for the Red Book's rare fauna and flora species and liabilities for damage inflicted to the species and their habitats.

The only red-listed species present in this area are steelhead (*Oncorhynchus mykiss*) and Steller sea lion. These as well as a number of other fish, marine mammals and birds are also discussed briefly below. Although no ongoing observer program exists for the fisheries, federal scientists, managers, and inspectors regularly visit the fishing sites and processing plants throughout the season. Over the course of the many years of fishing operations, none of these species are observed to have adverse impacts from the fishery. The fishing authorities have determined that the fishery has such low impacts that it needs no specific data collections on interactions with ETP species.

Seals and sea lions sometimes enter the fish traps to feed on fish. Large sea lions sometimes damage nets to get at salmon. Steller Sea lions are the only seal or sea lion species in the region formally protected in Russia, being included in the Red List of species. Other seal species are available for

commercial hunting, and moreover, allocated TAC is considerably underused because of degradation of hunting infrastructure. Incidental take of these seals or sea lions by tangling in gear has not been observed due to the nature of the gear. Other marine animals present in the area include killer whales, white whales, sea eagles, and cormorants. The passive nature of the fixed trap net gear substantially reduces opportunities for encounters with marine mammals or birds. Beach seines do not normally encounter or affect marine mammals.

The regional scientific organization has provided information documenting the large abundance of seals and sea lions (Shevlyakov et al. 2013a, 2013b, 2016). Review of available scientific literature has been conducted on the distribution and population status of seals and sea lions in western Kamchatka as well as food habits and salmon impacts (Kosygin et al. 1986; Lagerev 1988). It was also reported by the management agency that licenses can be obtained for harvest of seals. A biological quota for harvest is established by KamchatNIRO. However, the Ozernaya client companies have not obtained such a license because control is unnecessary and commercial values of seals do not support a directed harvest. The company has also adopted a specific policy prohibiting shooting of seals (as detailed for the previous condition).

In 2012, the company has adopted a policy of prohibiting any firearms on their fishing boats and use of firearms to scare, injure, or kill marine mammals and birds. The company also agreed to support initiation of an annual fishery observer program, in collaboration with the Wild Salmon Center, which will provide periodic observation of fishing practices at sea nets including encounter rates and the nature of interactions with marine mammals. The observer program has reported that interactions of marine nets and seals appear to be quite limited because seals are not abundant in the local fishery area at the time of fishing. However, these observations are based on limited effort. Compliance of fishermen with the company marine mammal protection policy was verified by fishery observers in 2015 (Semenov et al. 2016, KFF 2017).

3.4.4 Habitat

Habitat conditions for salmon in the Ozernaya system are relatively unaffected by human activity. The entire upper basin including Kuril Lake is protected from development by designation as a federal reserve. Development in the basin is limited to the vicinity of the river mouth and a portion of the estuary and adjacent wetland has been dredged and filled to maintain a small seaport associated with the fishery. Fishing activities do not appear to have a significant long-term impact on habitat. Portions of the river where beach seines are deployed are prepared during low flow conditions in late spring before the fishery by removing obstacles from the river bottom which might catch the seine and by clearing riparian vegetation at the seine site so that catches can be landed cleanly. Effects of disturbances are largely temporary, as seasonal flooding reconstructs the river bottom.

Dredging of fishing areas and the river mouth by the fishing companies is regulated by government permit. Permits specify locations, dates, amounts and procedures. All in-water work occurs between April 1 and April 20 which is outside the period of salmon migration and spawning. Specifications prohibit modification of the river channel beyond removal of substrate to specified depths. Removed material consisting primarily of gravel and sand is used for local road repair (hence not deposited in sensitive wetland or riparian habitats). Permit agreements also require the fishing companies to make payment for mitigation purposes. These payments are not directly applied to local programs but rather are used to fund hatchery activities in the Petropavlosk area.

At least one fishing company raised questions regarding the legality of various habitat work by their competitors. These actions led regulatory bodies - Management Administration of Federal Service on Supervision of Nature Use (Rosprirodnadzor) on the Kamchatka region and the North-East of the territorial Directorate of Federal Agency for Fisheries, who addressed to KamchatNIRO for

explanations about: how such work may affect the hydrological regime of the estuary of The Ozernaya River.

KamchatNIRO has initiated a program of monitoring of river-bed processes and elaboration of the prediction the dynamics of the development of the riverbed in the Ozernaya River to ensure sustainable harvesting at the area near the mouth. The program includes a range of short and long-term hydrological and ichthyologic research. The program will include recommendations to prevent negative impacts, if there are any.

As a condition of the first certification, the client contracted with the regional scientific agency to provide current data and information related to this certification condition. KamchatNIRO completed a report including: 1) an assessment of the impact of fishing on fish habitat in the lower part of The Ozernaya River (from the estuary of the river to the bridge); and 2) creation of a basic profile of the river (from the estuary to the bridge) identifying the topography of the bottom of the river and possible habitats of juvenile and adult salmon.

3.5 Principle Three: Management System Background

Management of Kamchatka salmon fisheries is administered by Federal and Regional governmental agencies. Kamchatka Kray, which includes Kamchatka Oblast and Koryak Autonomous Okrug is the subject of the Russian Federation and is a part of Far Eastern Federal Region (Okrug). It is under the direction and control of the Government of the Russian Federation. Key agencies and activities of the management system are summarized below and described in detail in the West Kamchatka salmon fishery assessment (MRAG 2016). Principle 3 is in common between the Ozernaya Sockeye and West Kamchatka salmon fisheries.

Federal Fishery Agency (FAR: Federal'noe Agentstvo po Rybolovstvu), located in Moscow, is responsible for management and control of fisheries in the Russian Federation. FAR interacts with various agencies at the federal level while controlling its territorial departments. FAR Policies and Regulation of fisheries are created by a consultative process involving a Public Council, which facilitates public discussions of accepted and proposed regulations.

SVTU is the Northeastern Territorial Administration of FAR which oversees local management and enforcement for Kamchatka Kray. SVTU has final approval of fishing concessions and in-season fishery management regulation actions (to open and close fisheries). They give fishing companies permission to harvest, monitor fishing companies and processors to ensure regulation compliance, and patrol streams to reduce poaching activities.

KamchatNIRO, located in Petropavlovsk-Kamchatsky, is the regional scientific agency responsible for research and monitoring of marine and freshwater resources in the Kamchatka region including the status of commercial species. It is one of a network of scientific research organizations operated by FAR under the oversight of TINRO-Center in Vladivostok. Branches are also located in Khabarovsk and Anadyr; Magadan (MagadanNIRO), and Yuzhno-Sakhalinsk (SakhNIRO). The status of these institutions is different. In Khabarovsk they have branch of TINRO-Tsentr, but SakhNIRO and KamchatNIRO are independent institutions.

SevvostRybvod (Northeastern Rybvod) is a Department of FAR responsible for operation of salmon hatcheries and conduct of related assessments. SevvostRybvod does not occupy as important a role in management of salmon fisheries in Kamchatka as, for instance, SakhRybvod in Sakhalin, because artificial reproduction is relatively insignificant in Kamchatka.

Rosprirodnadzor is the Federal agency responsible for enforcement and control. It is also responsible for State supervision of usage and protection of water bodies, wildlife and their habitats, federal level wildlife preserves, and environmental protection status.

Rosselkhoznadzor (Federal Agency for Veterinary and Phytosanitary Supervision) is responsible for Federal enforcement and control including accounting for and analysis of violations of technical regulations and other regulatory documentation, supervision of compliance with Russian Federation laws by the state agencies, local government, and the public, supervision of marine fishery ports and vessels, and administration of the Convention on the International Trade in Endangered Species of Wild Fauna and Flora.

Ministry of Fisheries of the Kamchatsky Kray operates an Anadromous Fish Commission (AFC) with responsibility for the distribution of expected yearly catch of salmon among users and identifying areas of commercial fishery, recreational fishing, and traditional fishery of the indigenous population. The AFC is chaired by the regional governor and consists of representatives from Federal executive bodies, including the federal security and environment protection authorities, as well as representatives of the regional government, federal, public associations, consolidations of legal entities (associations and unions), and scientific organizations. The AFC meets regularly and makes operational decisions on the time and duration of fishing by either closing fishing in spawning grounds in case of insufficient filling or by increasing the quotas in order to harvest excessive spawners from the mouths of rivers to avoid overflow of spawning grounds. The AFC's decisions are made through discussions and consultations with stakeholders. All meetings are open to the public. All decisions of AFC on fisheries management are subject to final approval by Territorial Administrations of FAR. Meeting minutes and decisions are posted on the Territorial Administration website (http://www.terkamfish.ru).

The current management system is regulated according to the federal law which was substantially amended in 2008 to give the government the authority to assign fishery sections to individual lease holders for up to 20 years, and entrust salmon fisheries management to the regional executive authorities. This regulation replaced the previous system, which was based on Total Allowable Catch allocations and centralized fishery management decisions through Moscow, with a much more responsive and effective regional system. The current system is widely viewed as an improvement for fisheries management as it can react more quickly to changes in run strength. In addition, fishing companies no longer have an incentive to under-report their catch because management is based on achieving spawning escapement rather than by quota limitations of a TAC.

4 EVALUATION PROCEDURE

4.1 Harmonised Fishery Assessment

MRAG Americas conducted an expedited assessment of the Ozernaya Sockeye Salmon fishery for addition of this Unit of Assessment to the VA-Delta Kamchatka salmon fishery which was certified in 2016 under FCR 2.0 (SAMFAM). The scope extension for VA-Delta Ozernaya Sockeye was carried out in lieu of a separate reassessment for this fishery in an effort to increase efficiency and minimize duplication in assessments.

4.2 Previous assessments

This fishery operated by Vityaz-Avto and Delta previously achieved MSC certification in September 2012 for the period through September 2017 under FCR v1.3 (Salmon Modification). Results of the 2012 Ozernaya Sockeye Salmon assessment as modified in subsequent surveillances are summarized in Table 6. In addition, the 4th Ozernaya Sockeye surveillance report can be downloaded from the MSC website here: https://fisheries.msc.org/en/fisheries/ozernaya-river-Sockeye-salmon/@@assessments. There were nine conditions and all were closed during the first assessment (Table 7).

Table 6. Revision of assessment scores based on closure of conditions for Ozernaya Sockeye (not addressed by this assessment).

Prin-ciple	Component	PI No.	Performance Indicator (PI)	Assessed score	Condition	Revised score
One	Outcome	1.1.1	Stock status	90		90
		1.1.2	Reference points	70	~~1~~	80
		1.1.3	Stock rebuilding	na		Na
	Management	1.2.1	Harvest strategy	95		95
		1.2.2	Harvest control rules & tools	90		90
		1.2.3	Information & monitoring	75	~~2~~	80
		1.2.4	Assessment of stock status	95		95
	Enhancement	1.3.1	Enhancement outcome	100		100
		1.3.2	Enhancement management	100		100
		1.3.3	Enhancement information	100		100
Two	Retained species	2.1.1	Outcome	80		80
		2.1.2	Management	80		80
		2.1.3	Information	70	~~3~~	80
	Bycatch species	2.2.1	Outcome	100		100
		2.2.2	Management	95		95
		2.2.3	Information	80		80
	ETP species	2.3.1	Outcome	75	~~4~~	80
		2.3.2	Management	80		80
		2.3.3	Information	70	~~5~~	80
	Habitats	2.4.1	Outcome	90		90
		2.4.2	Management	80		80
		2.4.3	Information	75	~~6~~	80
	Ecosystem	2.5.1	Outcome	100		100
		2.5.2	Management	95		95
		2.5.3	Information	90		90
Three	Governance and policy	3.1.1	Legal & customary framework	90		90
		3.1.2	Consultation, roles & responsibilities	85		85
		3.1.3	Long term objectives	80		80
		3.1.4	Incentives for sustainable fishing	80		80
	Fishery specific management system	3.2.1	Fishery specific objectives	80		80
		3.2.2	Decision making processes	100		100
		3.2.3	Compliance & enforcement	75	~~7~~	80
		3.2.4	Research plan	70	~~8~~	80
		3.2.5	Management performance evaluation	60	9	80
Overall weighted Principle-level scores						
	Principle 1 - Target species			~~89.6~~		91.6
	Principle 2 - Ecosystem			~~84.0~~		86.0
	Principle 3 – Management			~~80.4~~		83.9

Table 7. Summary of Previous Assessment Conditions

No.	Condition	Performance Indicator	Year closed	Justification
1	Demonstrate that the target reference point is such that the stock is maintained at a level consistent with BMSY or some measure or surrogate with similar intent or outcome. Demonstrate that where the wild stock is a management unit comprised of more than one subcomponent, it is highly likely that the target and limit reference points are consistent with maintaining the inherent diversity and reproductive capacity of each stock subcomponent.	1.1.2. Reference points	Yr 1 (2014)	KamchatNIRO reviewed the biological basis for the current escapement goal and elected to not to increase the goal in response to several years of high returns due to uncertain future trends. The surveillance team determined that current goals do not result in significant risks to the sustainability of this stock under current high patterns of productivity. The management system does not explicitly define separate escapement goals for early and late stock components which return to different spawning areas, but manages to distribute escapement throughout the duration of the run based on regular passing days when the in-river fishery is closed (typically two days open, two days closed).
2	Demonstrate that the fishery has good information on all other fishery removals from the stock.	1.2.3. Information & monitoring	Yr 3 (2016)	Data were provided documenting estimates of high seas drift net harvest of Ozernaya Sockeye in the Russian Exclusive Economic Zone fisheries from 2000 through 2014. An independent observer program conducted in 2013-2016 by the fishing companies in cooperation with the Word Wildlife Federation and the Kamchatka State Technical University, confirmed a negligible incidence of unaccounted illegal harvest.
3	Provide sufficient data continue to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the	2.1.3. Retained species information	Yr 3 (2016)	Annual data on retained catch in the fishery since 1991 was provided by the fishing companies and KamchatNIRO. Additional information on abundance, escapement, harvest and biological characteristics of pink, chum, coho and char in the Ozernaya River was provided by KamchatNIRO in a 2016

	strategy).			report
4	Demonstrate that indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	2.3.1. ETP species outcome	Yr 3 (2016)	In 2012, the company has adopted a policy of prohibiting any firearms on their fishing boats and use of firearms to scare, injure, or kill marine mammals and birds. An observer program funding by the fishing companies reported that interactions of marine nets and seals appear to be quite limited because seals are not abundant in the local fishery area at the time of fishing. Compliance of fishermen with the company marine mammal protection policy was verified by fishery observers.
5	Provide sufficient data to allow fishery-related mortality and the impact of fishing to be quantitatively estimated for protected species.	2.3.3. ETP species information	Yr 1 (2014)	The client contracted with KamchatNIRO to provide related information including an assessment of the impact of fishing of Sockeye Salmon school in the Ozernaya River on the number of seals and sea lions in area of the operation.
6	Provide sufficient data to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	2.4.3. Habitat information	Yr 2 (2015)	An assessment of habitat conditions and the impact of fishing on habitat in the lower part of The Ozernaya River from the estuary of the river to the bridge was completed by KamchatNIRO.
7	Provide evidence of systematic compliance.	3.2.3. Compliance & enforcement	Yr 3 (2016)	Implementation of an independent observer program provided corroboration regarding compliance with seal protection regulations and policies, demonstrated that beach seines and set nets are always operated within legal fishing parcels only during legal fishing periods, and confirmed a negligible incidence of illegal fishing on the Ozernaya as a result of active enforcement efforts.
8	Provide research plan.	3.2.4. Research plan	Yr 1 (2014)	KamchatNIRO reported that monitoring researches of the biota on the basis of scientific station of KamchatNIRO on Lake Kuril have been conducted since 1940, with a

				continuous series of observations of more than 70 years. Research is conducting using an ecosystem approach that includes not only the study of the biology of Pacific salmon, but also conditions of their habitat. A standardized monitoring program of Ozernaya Sockeye is implemented each year.
9	Provide annual Sockeye run and fishery monitoring and evaluation information.	3.2.5. Management performance	Yr 4 (2017)	The client contracted with KamchatNIRO to provide annual data and information related to this certification condition.

4.3 Assessment Methodologies

This assessment used FCR v2.0 (1 October 2014), with modifications to the default assessment tree for salmon fisheries as defined by the Marine Stewardship Council (MSC). The report was produced with MSC Full Assessment Reporting Template: Salmon fisheries v1.0 (8 October 2014). The default assessment tree for salmon fisheries was used without adjustments.

The same methodology was employed for the 2016 certification of the the VA-Delta Kamchatka salmon fishery, to which this VA-Delta Ozernaya Sockeye reassessment is a scope extension. The determination of components needing assessment was based on information gathering and the site visit phase of the expedited assessment. As the VA-Delta Kamchatka salmon fishery covers pink, chum, and coho salmon caught using the same gears and including the same fishing areas as those for the Ozernaya Sockeye fishery, Ozernaya Sockeye are assessed only against Principle 1 of the MSC Standard. The assessment of Principles 2 and 3 leading to the existing West Kamchatka certification for the chum, coho and pink fisheries is the same as for Ozernaya Sockeye and unchanged when considering Ozernaya Sockeye for recertification, as no aspects of the management or environmental impacts are different. The following components are held in common between the two assessments: Principle 2 all components, and Principle 3 governance and policy and fisheries specific management. Those components not to be held in common are as follows: Principle 1 all components.

4.4 Evaluation Processes and Techniques

4.1.1 Site Visits

Thirty days prior to the assessment, all stakeholders from the full assessment and previous surveillance audits were informed of the meeting and the opportunity to provide information to the auditors in advance of, or during, the meeting. The notification for expedited scope extension was also published on the MSC website on 13 February 2017.

The site visit was held in Petropavlovsk-Kamchatsky, Russian Federation on March 28 – March 30, 2017 (concurrent with the fourth annual Ozernaya Sockeye surveillance audit). The team consisted of Ray Beamesderfer (team leader) and Dr. Dmitry Lajus, both of whom were members of the previous assessment team.

Information supplied by the clients and management agencies was reviewed by the assessment team ahead of the on-site meeting, and discussions with the clients and management agencies centered on the content within the provided documentation. In cases where relevant documentation was not provided in advance of the meeting, it was requested by the assessment team and subsequently supplied during or shortly after the meeting.

Meetings were conducted in the Vityaz Avto Company Offices and included a number of stakeholder observers. A meeting with government scientific agency KamchatNIRO was conducted at the agency office. The following participants were in attendance:

Table 8. Assessment meetings in Petropavlovsk-Kamchatka, 2017.

	Name	Affiliation	Subject
March 28	Ivan Teplukhin	Client – General Director	Introductions & welcome
	Andrei Bokov	Client – Head of Technology Department	Recent fishery information, progress on conditions, related information
	Alexander Goncharov	Client Technology Department	Logistical support
	Natalia Novikova	ForSea Solutions - U.S.	Client contractor
	Randy Ericksen	RP Ericksen Consulting	Client contractor
	Denis Semenov	World Wildlife Federation – RU	Russian stakeholder observer

	Vladimir Galytsin	Minister of Fisheries, Kamchatka Regional Administration	Management System
	Alexander Bonk	Kamchatka State Technical University	Fishery observer program
March 29	Andrei Bokov	Client – Head of Technology Department	Recent fishery information, progress on conditions, related information
	Alexander Goncharov	Client Technology Department	Logistical support
	Natalia Novikova	ForSea Solutions - U.S.	Client contractor
	Randy Ericksen	RP Ericksen Consulting	Client contractor
	Segey Vakhrin	NGO Stakeholder	Public involvement process, Illegal Fishing
	Sergey Korostelev	World Wildlife Federation – RU Former Director of KamchatNIRO	Public involvement, Stock Assessment, Fishery Management
March 30	Andrei Bokov	Client – Head of Technology Department	Recent fishery information, progress on conditions, related information
	Alexander Goncharov	Client Technology Department	Logistical support
	Natalia Novikova	ForSea Solutions - U.S.	Client contractor
	Randy Ericksen	RP Ericksen Consulting	Client contractor
	Alexander Bugaev	KamchatNIRO	Stock assessment & fishery management
	Ivan Teplukhin	Client – Deputy General Director	Closing meeting

Discussions covered all issues as laid out in annex CG of the MSC Certification Requirements. The assessors drew from referenced material (emails, notices, research submissions, published and draft documents and personal communications) to support the findings in the report.

New documents provided to the assessment team at the site visit included:

- Harvest numbers in 2016 of salmon and char by the fishing companies for the unit of certification (spreadsheet tables).
- Run size, harvest and escapement numbers of Ozernaya Sockeye for 2016 (Official stamped document from KamchatNIRO
- Ten-year average run size of salmon by species in West Kamchatka Rivers (KamchatNIRO data)
- List of member companies in Ozernaya Fishermen's Association
- Report titled "The optimum spawning pass to the Kuril Lake in the context of ecosystem process trends in recent decades" by E. V. Lepskaya, T. V. Bonk and V. A. Dubynin of KamchatNIRO.
- Kamchatka Fish Fund. 2017. Independent observers Vityaz-Avto and Delta Fishery Report for 2016. Kamchatka Fishing Federation. Petropavlovsk-Kamchatsky, Russian Federation.
- Summary of Kamchatka Krai government meeting of the regional fishery council regarding plans for the 2016 salmon fishing season and related enforcement activities.
- Summary of 2016 meeting of the Kamchatka Commercial Fishing Board (Federal-Regional coordinating body) regarding the 2016 salmon season.

4.4.1 Standards and Guidelines used:

- MSC Certification Requirements version 2.0 (for process and performance requirements, including salmon assessment tree)
- Guidance to the MSC Certification Requirements version 2.0 (for process requirements)
- MSC Full Assessment reporting template for salmon fisheries.

4.1.2 Consultations

See Table 8, above, with respect to details of the individuals interviewed during the site visit, and summary of topics discussed. There were no written submissions or requests for meeting with the assessment team received from Environmental Non-Governmental Organizations (ENGOs).

4.1.3 Evaluation Techniques

The scoring meetings included an evaluation of the information available relative to the assessment tree that was developed for this fishery. Discussions within the team reached scoring conclusions by consensus.

MRAG Americas compiled a stakeholder list based on interest expressed during the assessment and used that list plus any additions to directly notify stakeholders of the process. The Ocean Outcomes (formerly affiliated with the Wild Salmon Center) and WWF helped inform stakeholders in the region of the assessment, as the MRAG Americas announcements occurred in English and stakeholders primarily speak Russian.

The MRAG Americas assessment team met regularly to discuss the background information and the impact of that information on the scoring of each performance indicator. Through consensus, the team evaluated each scoring issue to determine which the fishery achieved, and agreed on a score.

The MRAG Americas assessment team followed the MSC CR that specified that each performance indicator must score 60 or higher and that each principle must have a weighted average of 80 or above. The team used the "few, many, most" protocol for scoring performance indicators as described in the MSC CR.

The RBF was not used for this assessment.

Table 9. Scoring elements (from MRAG Americas 2016b—P2 was not assessed in this scope extension).

Component	Scoring elements	Main/not main	Retained?	Data-deficient?
Principle 1	Sockeye Salmon[a]	--	Yes	No
Primary	Coho salmon	Main	Yes	No
Primary	Chinook Salmon [a]	Not Main	No	No
Secondary	Char	Not Main	Yes	No
Secondary	Masu Salmon	Not Main	No	No
Secondary	Miscellaneous marine species	Not Main	No	No
ETP	Steelhead	--	No	No
ETP	Steller sea lion		No	No
Habitat	Sand & gravel bottom	Main	No	No

[a] *Ozernaya River of the West Coast of Kamchatka. Ozernaya pink and chum salmon are Principle I species in the VA-Delta West Kamchatka certification.*

5 TRACEABILITY

5.1 Eligibility Date

The target eligibility date for product from the fishery to bear the MSC label will be the date of release of the PCDR (June 29, 2017), which precedes the expiration of the current certificate in September 2017.

5.2 Traceability within the Fishery

Daily catch of salmon from traps is delivered by boats to the shore, where it is weighed and reloaded to mobile containers that transport chilled fish. Catch from beach seines is brought ashore by the nets, and loaded to mobile containers that transport chilled fish. Ice is used for cooling the fish. While the catch is transported, it is accompanied by a document specifying the place and the crew that captured it, the weights of the transported fish, and the processing facility where the catch is being delivered. Upon delivery, the fish are weighted again by the processing facility and then the catch is sent for processing. The processing plants track numbers of salmon by species by day for each fishing parcel. Transhipment does not occur.

Table 10. Points of landing for fishing parcels permitted for use by Vityaz-Avto and Delta companies. All points of landing are adjacent to shoreline fishing sites.

Co.	Parcel	Water body	Point of landing	Ozernaya Sockeye certification	Processing location
Vityaz-Avto	752	Ozernaya river	River shoreline	Yes	Ozernaya
	189	Sea of Okhotsk	Ocean beach	Yes	Ozernaya and Koshegochek
	191	Sea of Okhotsk	Ocean beach	Yes	Ozernaya and Koshegochek
	197	Sea of Okhotsk	Ocean beach	Yes	Ozernaya
	203	Sea of Okhotsk	Ocean beach	Yes	Ozernaya
	204	Sea of Okhotsk	Ocean beach	Yes	Ozernaya
Delta	755	Ozernaya river	River shoreline	Yes	Ozernaya
	198	Sea of Okhotsk	Ocean beach	Yes	Ozernaya

Arriving catch is recorded in the log of the processing facility. The processing plants track numbers of salmon by species by day for each fishing parcel. The record contains the location of the catch and company which submits catch. Both the companies' logs and the processing facilities' logs are regularly checked by SKTU inspectors, sanitary-epidemiological control and territorial RosPrirodNadzor. The facts of such inspections are also being recorded in appropriate logs.

All fish delivered from landing sites have documentation that shows date, location, volumes, species, and fishing operator. Since each operator has a commercial fishing permit that also identifies gear type, documentation of the different gear types and operators would prevent substitution at delivery. Subsequent chain of custody would assure separation after the initial delivery.

Ozernaya Sockeye are landed in the Ozernaya River and on coastal beaches for nearby fish traps in marine waters. Ozernaya Sockeye is certified and independently tracked by fishing parcel which allows them to be distinguished from uncertified Sockeye catches that occur in other rivers and marine parcels in west Kamchatka. All certified Ozernaya Sockeye are delivered to the Ozernaya processing plant. Sockeye from other rivers and marine traps may also be delivered to the Ozernaya plant for processing but only those caught in sites identified in the Ozernaya certification are certified. Certified catch is distinguished from ineligible catch of the same species based on fishing site. No Chinook salmon caught in the West Kamchatka fishery is certified.

Some risk occurs that illegally harvested fish or fish harvested by a company not under the certificate sharing agreement could be accepted at a processing facility as certified. Substantial efforts by the certificate-sharing companies to enhance enforcement activities by supplying personnel, equipment, and funding to the authorities minimizes the opportunity for illegal harvest in the beach regions where legal fishing occurs. These companies also support enforcement activities further up river to minimize the opportunity of illegal harvest of roe. Therefore, the likelihood is low of illegal product entering the processing facilities with the proper documentation and weights that would pass inspections by the authorities.

MSC traceability requirements were checked only as far as salmon landed at authorized fishing parcels by legally permitted fishing companies under the certificate sharing agreement and delivered to processing facilities, where the landings can be monitored in accordance with MSC chain of custody requirements. Under the certificate sharing agreement, authorized fishing companies may use the certificate and apply the MSC logo if they deliver to a processing facility that holds MSC chain of custody certification.

The occurrence of illegal fishing in the Russian Far East suggests a need for robust chain of custody to mitigate the risk of product from a non-certified source entering the supply chain. Chain of custody would begin at the point of delivery of product from a company participating in the certificate sharing agreement to a processing facility, whether the facility is owned by the participating company or by another entity.

Table 11. 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	Gillnets are used at one up-river fishing parcel controlled by the companies in the unit of assessment. Gillnet fish must be delivered by special transport, that is easy to distinguish from fish transported from beach seines or trap nets. Record keeping is strong under the current management system, due to government monitoring and because fishermen get paid based on catch, and they compare records from the parcel with the factory records to assure full pay.
Potential for vessels from the Unit of Certification to fish outside the Unit of Certification or in different geographical areas (on the same trips or different trips)	Not present – Vessels are owned by the companies and are assigned to the active fishing parcels. Vessels could not obtain fish from beyond company fishing activities without detection because the plants and the government inspectors compare logbook records from a parcel with landing at the plant.
Potential for vessels outside of the Unit of Certification or client group fishing the same stock	Client group companies do not accept fish from other companies, and process only their own fish. No legally caught fish from other companies could surreptitiously enter the processing plants of client group companies as all fish must have documentation checked frequently by federal authorities, and documentation of fish from other companies would easily be evident.
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)	Not present – all covered by chain of custody. All fish delivered from landing sites have documentation that shows date, location, volumes, species, and fishing operator. Since each operator has a commercial fishing permit that also identifies gear type, documentation of the different gear types and operators would prevent substitution at delivery.
Risks of mixing between certified and	Not present – chain of custody starts at delivery to the

non-certified catch during processing activities (at-sea and/or before subsequent Chain of Custody)	processing plan, with chain of custody documented in all subsequent processing steps
Risks of mixing between certified and non-certified catch during transhipment	Not present – No transhipment
Any other risks of substitution between fish from the Unit of Certification (certified catch) and fish from outside this unit (non-certified catch) before subsequent Chain of Custody is required	Not present

5.3 Eligibility to Enter Further Chains of Custody

Salmon produced by fishing companies in the client group with authorization to fish with nets within the fishing district landed from authorized parcels are eligible to enter further chain of custody. Chain of custody begins at delivery of salmon to a processing facility in the client group or at a point of change in ownership of the fish. Members of the Client Group (VA and Delta) own the fish they catch, commencing at the point of fish catch. Fishing sites are leased and operated by the members of the Client Group, which also operate the processing plants. Documentation of the fish is sufficient (see section 5.2) such that chain of custody is not necessary for transport of wholly-owned fish from the point of catch to delivery at the processing plant.

Should other companies share the certificate at some point in the future and sell fish to VA, Delta or other company holding chain of custody, chain of custody would start at the point of sale, but no later than delivery to a processing plant. Any companies buying from processing facilities that receive certified product are required to have chain of custody certification for further sale and distribution. This certification did not evaluate other landing sites that are not part of the certification determination or subsequent distribution for chain of custody. To use the MSC logo, subsequent links in the distribution chain must enter into a separate chain of custody certification that proves they can track the salmon product to a chain of custody holder.

6 EVALUATION RESULTS

6.1 Principle Level Scores

Principle 1 scores were based on this scope extension which was limited to this principle. Principle 2 and 3 scores were identified in the VA-Delta Kamchatka salmon certification and apply to Ozernaya Sockeye as well.

Final Principle Scores	
Principle	**Score**
Principle 1 – Target Species (Ozernaya Sockeye	97.9
Principle 2 – Ecosystem (from MRAG Americas 2016b)	85.7
Principle 3 – Management System(from MRAG Americas 2016b)	81.9

6.2 Summary of PI Level Scores

Prin-ciple	Wt (L1)	Component	Wt (L2)	PI No.	Performance Indicator (PI)	Wt (L3)	Weight in Principle	Score Sockeye
One	1	Outcome	0.333	1.1.1	Stock status	1	0.333	100
				1.1.2	Stock rebuilding	0	0.000	na
		Management	0.333	1.2.1	Harvest strategy	0.25	0.083	95
				1.2.2	Harvest control rules & tools	0.25	0.083	95
				1.2.3	Information & monitoring	0.25	0.083	90
				1.2.4	Assessment of stock status	0.25	0.083	95
		Enhancement	0.333	1.3.1	Enhancement outcome	0.333	0.111	100
				1.3.2	Enhancement management	0.333	0.111	100
				1.3.3	Enhancement information	0.333	0.111	100
Two	1	Retained species	0.2	2.1.1	Outcome	0.333	0.067	80
				2.1.2	Management	0.333	0.067	90
				2.1.3	Information	0.333	0.067	70
		Bycatch species	0.2	2.2.1	Outcome	0.333	0.067	100
				2.2.2	Management	0.333	0.067	80
				2.2.3	Information	0.333	0.067	80
		ETP species	0.2	2.3.1	Outcome	0.333	0.067	85
				2.3.2	Management	0.333	0.067	90
				2.3.3	Information	0.333	0.067	80
		Habitats	0.2	2.4.1	Outcome	0.333	0.067	95
				2.4.2	Management	0.333	0.067	95
				2.4.3	Information	0.333	0.067	80
		Ecosystem	0.2	2.5.1	Outcome	0.333	0.067	90
				2.5.2	Management	0.333	0.067	90
				2.5.3	Information	0.333	0.067	80
Three	1	Governance and policy	0.5	3.1.1	Legal & customary framework	0.3	0.150	100
				3.1.2	Consultation, roles &	0.3	0.150	85
				3.1.3	Long term objectives	0.3	0.150	80
		Fishery specific management system	0.5	3.2.1	Fishery specific objectives	0.25	0.125	80
				3.2.2	Decision making processes	0.25	0.125	75
				3.2.3	Compliance & enforcement	0.25	0.125	70
				3.2.4	Management performance	0.25	0.125	80

6.3 Summary of Conditions

No conditions are identified under Principle 1 in this scope extension of the VA-Delta Kamchatka salmon fishery to Ozernaya Sockeye. Ozernaya Sockeye are subject to conditions identified under Principles 2 and 3 for the VA-Delta Kamchatka salmon fishery (MRAG 2016b). The 2012 certification

of Ozernaya Sockeye included nine conditions but all were closed during the first assessment (MRAG 2017).

6.4 Recommendations

Annual surveillance of the Ozernaya Sockeye fishery will be conducted as part of the VA-Delta West Kamchatka salmon fishery surveillance. Annual information on Sockeye harvest and escapement as well as any other new information will be assessed at that time to identify any significant changes in status which might affect conclusions of this assessment.

6.5 Determination, Formal Conclusion and Agreement

MRAG Americas has determined that this fishery should be recertified as sustainable according to the Marine Stewardship Council Fishery Standard. This draft determination will be confirmed following the objection period.

REFERENCES[2]

Antonov, N.A., V. F. Bugaev, E. G. Pogodaev. 2007. Biological structure and dynamics of the two schools of Sockeye Salmon *Oncorhynchus nerka* of Western Kamchatka's rivers The Palana and The Bolshaya // Izvestia TINRO. So 150. C. 137-154.

Augerot, X., and D. N. Foley. 2005. Atlas of Pacific Salmon. University of California Press. Berkeley, California, USA.

Birman I. B., and S. M. Konovalov.1968. Distribution and migration in the sea local schools of red *Oncorhynchus nerka* (Walbaum) of the Kuril lake // Voprosy Ikhtiologii. So-8, vol.4(51). 6. 728–736.

Bugaev A. V. 2002. To the question about the possible interception part stud Sockeye Salmon (*Oncorhynchus nerka*) R. Brown and R. Kamchatka by nets in some areas in the coastal zone of the Eastern and Western Kamchatka) / / Research of aquatic biological resources of the Kamchatka and Northern-Western part of the Pacific Ocean. Petropavlovsk-Kamchatsky: KamchatNIRO, Vol.6. 192–202.

Bugaev V. F. Age structure of commercial stocks Asian Sockeye Salmon *Oncorhynchus nerka* (Walbaum) // Studies of biology and abundance of commercial fish Kamchatka shelf // Petropavlovsk-Kamchatsky: KamchatNIRO, 1991. Vol. 1. 'clock 1. C. 46-54.

Bugaev V. F. Asian Sockeye Salmon (freshwater period of life, the structure of local populations, population dynamics) // M: Kolos. 1995. 464 C.

Bugaev V. F. Asian Sockeye-2 (biological structure and dynamics of local populations in the end of XX - beginning of XXI centuries). Petropavlovsk-Kamchatsky: Kamchatpress, 2011. 380 p.

Bugaev V. F. 1983. Spatial structure Asian Sockeye Salmon Oncorhynchus nerka (Walbaum) in the basin of R. Kamchatka. Avtoref. dis. ... Cand. Biol. Sciences. M: MSU. 22 C.

Bugaev, V. F. 2011. Asian Sockeye Salmon (freshwater period of life, biological structure, population dynamics). Petropavlovsk-Kamchatsky Izdatelstvo “Kamchatpress.”

Bugaev V. F., Dubynin V. A. 2000. Factors which influencing biological indices and population dynamics of Sockeye Salmon *Oncorhynchus nerka* of Ozernaya and Kamchatka Rivers. Izvestia TINRO, V. 10, P. II: 679-757.

[2] *Includes related references identified in VA-Delta West Kamchatka salmon certification.*

Bugaev V.F., A.V. Maslov, V.A. Dubynin. 2009. Ozernovskaya nerka [Sockeye salmon of Ozernaya River]. Kamchatpress. Petropavlovsk-Kamchatsky.

Bugaev, V. F., A. G. Ostroumov, K. U. Nepomnyashchy, and A. V. Maslov. 2001. Sockeye Salmon *Oncorhynchus nerka* R. Large (Western Kamchatka) // Conservation of biodiversity of Kamchatka and adjacent seas: Mat. II scientific. proc. On April 9-10, 2001, Petropavlovsk-Kamchatsky: Kamshat. 36-38.

Bugaev, V. F., A. G. Ostroumov, K. U. Nepomnyashchy, and A. V. Maslov. 2002. Some features of biology of Sockeye Salmon Oncorhynchus nerka R. Big (Western Kamchatka) and factors affecting its biological indicators, Izv. TINRO. So 130. H. 2. C. 758-776.

Burgner, R. L. 1991. Life history of Sockeye Salmon (*Oncorhynchus nerka*). Pages 1 to 118 in C. Groot and L. Margolis, editors. Pacific salmon life histories. University of British Columbia Press. Vancouver, British Columbia, Canada.

Burkanov, V. N. 1988. Modern state of the resources of marine mammals in Kamchatka // Rational use of biological resources Kamchatka shelf. Petropavlovsk-Kamchatsky: the far Eastern book. Izd-vo, Kamchatka separa-tion. C. 138-176.

Burkanov, V. N. 1986. The distribution and number of seals off the coast of Kamchatka in August // research on marine mammals of the Northern Pacific in 1984-1985 M: VNIRO. C. 45-50.

Clarke, S. C., M. K. McAllister, and R. C. Kirkpatrick. 2009. Estimating legal and illegal catches of Russian Sockeye Salmon from trade and market data. ICES Journal of Marine Sciences 66:532-545.

Clarke, S., 2007. Trading tails: Russian salmon fisheries and the East Asian markets. TRAFFIC East Asia. http://www.traffic.org/fish

Degtev, A.I., E. A. Shevlyakov, K. M. Small, and V. A. Dubynin. Experience of quantitative assessment of juveniles and manufacturers of Pacific salmon hydro-acoustic method of migration routes in freshwater bodies, " Izvestia TINRO. The so-170. 2012. C. 113-135.

Dronova, N. A., and V. A. Spiridonov. 2008. Illegal, unreported, and unregulated Pacific salmon fishing at Kamchatka. World Wildlife Foundation and Traffic International. www.traffic.org/species-reports/traffic_species_fish32.pdf

Dubynin, V. A., V. F. Bugaev, E. A. Shevlyakov. 2007. To the question of how the by-catch of marine by nets near some minor rivers of Western Kamchatka Sockeye not owned by the flocks of these rivers, Izvestia TINRO. So 149. C. 226-241.

Egorova, T.V. Seasonal dynamics of biological structure and numbers of flocks of Pink Salmon p. Big // Abstracts of the scientific-practical conference «Biological resources of the Kamchatka shelf, their racionalnoe use and protection» (Petropavlovsk-Kamchatsky, October 15-16, 1987). Petropavlovsk-Kamchatsky: Cominro, 1987. C. 44-45.

Esin, E.V., V. Leman, YU. Sorokin, and S. R. Chalov. 2012. Population consequences of abundant approach salmon Oncorhynchus gorbuscha to severovostochnaya coast of Kamchatka in 2009 // Vorposy ichthyologii 52 (4): 446-455.

Essington, T.E., 2009. Trophic cascades in open ocean ecosystems. In: Terborgh, J.W., Estes, J.A. (Eds.), The science of trophic cascades. Island Press.

Gaichas, S. K, and R.C. Francis 2008. Network models for ecosystem-based fishery analysis: a review of concepts and application to the Gulf of Alaska marine food web. Can. J. Fish. Aquat. Sci. 65:1965-1982

Gende, S. M., R. T. Edwards, M. F Willson, and M. S. Wipfli 2002. Pacific Salmon in Aquatic and Terrestrial Ecosystems. BioScience 52:917-928.

Groot, C. and L. Margolis 1991. Pacific Salmon Life Histories. Vancouver, British Columbia (Canada). UBC Press.

Heard, W. T. 1991. Life history of Pink Salmon (*Oncorhynchus gorbuscha*). Pages 119 to 230 in C. Groot and L. Margolis, editors. Pacific salmon life histories. University of British Columbia Press. Vancouver, British Columbia, Canada.

Irvine, J. R., and 9 coauthors. 2009. Pacific salmon status and abundance trends. North Pacific Anadromous Fish Commission Document 1199, rev. 1.

Kaufmann, D., A. Kraay, and M. Mastruzzi. 2013. Worldwide Governance Indicators. The World Bank Group. http://info.worldbank.org/governance/wgi/index.aspx#home

Kizevetter, I. V. Technological and chemical characteristics of commercial fish of the Pacific rim. Vladivostok: Palizdar, 1971. 298 C.

Klovach, N. V. 2003. Environmental impact of large-scale cultivation of Chum Salmon. M: Izd-vo VNIRO, 164 C.

Klovach, N., O. Temnykh, V. Shevlyakov, E. Golub, A. Kanzeparova, E. Shevlyakov, A. Kaev, and V. Volobuev. 2016. Biostatistical information on salmon catches, escapement and enhancement production in Russia in 2014. NPAFC Doc. 1565 Rev. 2. This document has been revised and the revised version will likely be available in mid-2016.

Klyashtorin, L. B. 2000. Pacific salmon: climate and dynamics of reserves (in Russian). no. 4. C. 32-34.

Kolomeytsev, V. V. 2009. The effects of the hydrological conditions in the distribution of juvenile Pacific salmon in the Eastern Okhotsk Sea in early marine period of life. Research of water biological resources of Kamchatka and of the northwest part of Pacific Ocean: Selected Papers. Petropavlovsk-Kamchatski: KamchatNIRO. 14: 5-13. (In Russian with English summary).

Konovalov, S. M. 1971. Differentsiatsia lokalnykh stad nerki [Differentiation of local stock of Sockeye Salmon]. (Differentiation of local stocks of Sockeye Salmon). HP: Nauka, Leningradskoe otdelenie, 1971. 229 C.

Kosygin, G. M., A. M. Trukhin, V.N. Burkanov, and A. I. Makhnyr. 1986. Rookeries of seals on the shores of the Okhotsk sea // Scientific research works on marine mammals of the Northern Pacific Ocean in 1984-1985 M: VNIRO, C. 60-70.

Koval, M., E. Lepskaya, V. Dubynin, and E. Shevlyakov. 2014. Biological monitoring of a key salmon population: Ozernaya River Sockeye Salmon of West Kamchatka. NPAFC Newsletter 35:15-20.

Krokhin, E.M., and F. W. Krogius. Essay basin R. Big and salmon spawning habitat, located in it, Izv. TINRO. So 9. 1937. 158 S.

Lagerev, S.R. Results aviation studies of coastal rookeries of seals in the sea of Okhotsk in 1986. / / Scientific research works on marine mammals of the Northern Pacific Ocean in 1986-1987 M: VNIRO, 1988. C. 80-89.

Leman, V.N. Esin E.V. 2008. Illustrated key of salmonid fishes of Kamchatka. Moscow, Izdatelstvo VNIRO.

Mahnken, C., G. Ruggerone, W. Waknitz, and T. Flagg. 1998. A historical perspective on salmonid production from Pacific Rim hatcheries. North Pacific Anadromous Fish Commission Bulletin 1:38-53.

Maksimov, S.V. and V.N Leman (eds.). 2008. Regional concept of reduction of illegal salmon fishing in Kamchatka region. 2008. Expert version submitted for public discussion. Izdatelstvo VNIRO.

Markovtsev, V. G. 2008. Status and prospective of artificial propagation of Pacific salmon in the Russian Far East. "Dalnevostochny region – rybnoe khoziaistvo" 4(13) p. 4-19.

MRAG Americas. 2012. Ozernaya Sockeye Salmon Fishery. Marine Stewardship Council Final Report and Determination. https://cert.msc.org/FileLoader/FileLinkDownload.asmx/GetFile?encryptedKey=KiLbhlV1bU3cmPVoH42r7EzHdJW0icsQfF8S2yC9Rq84sAR3AvqIuL0Bt6RWHxB4

MRAG Americas. 2013. Ozernaya Sockeye Salmon Fishery. Marine Stewardship Council 1st Surveillance Report. https://cert.msc.org/FileLoader/FileLinkDownload.asmx/GetFile?encryptedKey=tYcjgp05MhD2djO1HB2bAt+mrboU/0J0N4SL5Bprk0o+Tnu4fH+3wzLNOSpavWfb

MRAG Americas. 2015. Ozernaya Sockeye Salmon Fishery. Marine Stewardship Council 2nd Surveillance Report. https://cert.msc.org/FileLoader/FileLinkDownload.asmx/GetFile?encryptedKey=DXW9yCoXl1zgPTgAPZSaQcr98U34BIHTDIuxhf6k3tPWEY0VzWHkHhl1Q6lC7Edr

MRAG Americas. 2016a. Ozernaya Sockeye Salmon Fishery. Marine Stewardship Council 3rd Surveillance Report. https://cert.msc.org/FileLoader/FileLinkDownload.asmx/GetFile?encryptedKey=hMpuZFrya1g7YbNUJK8llgq1MbZH2a8oZalvzAsduqFIgEkkmbB/C8dKDCZnSJF/

MRAG Americas. 2016b. VA-Delta Kamchatka Salmon Fisheries. Marine Stewardship Council Final Report and Determination. https://cert.msc.org/FileLoader/FileLinkDownload.asmx/GetFile?encryptedKey=YeWWH/er//PCSDLWHzY3c7hW9wpgNrMDFKAdZuDIP5/9SaCp6LDEweJ6jHQOg2df

MRAG Americas. 2017. Ozernaya Sockeye Salmon Fishery. MSC 4th Surveillance Report. https://cert.msc.org/FileLoader/FileLinkDownload.asmx/GetFile?encryptedKey=Mrqqejs8vCx7Y0naOAbxzdHkwug5DcDtv2w7lrha+BL7HlKQo891ANWlhOu5lsUQ

Myers, K. W., R. V. Walker, N. D. Davis, J. L. Armstrong, and M. Kaeriyama. 2009. High seas distribution, biology, and ecology of Arctic–Yukon–Kuskokwim salmon: direct information from high seas tagging experiments, 1954–2006. Pages 201–239 in C. C. Krueger and C. E. Zimmerman, editors. Pacific Salmon: ecology and management of western Alaska's populations. American Fisheries Society, Symposium 70, Bethesda, Maryland.

Naidenko, S. V. 2009. The role of Pacific salmon in the trophic structure of the upper epipelagic layer of the western Bering Sea during summer–autumn 2002–2006. N. Pac. Anadr. Fish Comm. Bull. 5: 231–241.

Nikolaev, A.T. About population dynamics of large herds of Chum Salmon Oncorhynchus keta (Walbaum) in Kamchatka // Voprosy Ikhthyologii. 1980. So 20. Vol. 3. C. 452-463.

Ostroumov, A.G. 1964. Application of aerial survey methods for asseesment of salmon spawning escapement. Lososevoe khoziaistvo Dalnego Vostoka. M. Nauka, pp. 90-99.

Pachkevich, R. I. 1996. Kamchatka geothermal resources development: problems and perspectives. Proceedings of the twenty first workshop on geothermal reservoir engineering. Stanford University, California. (http://www.geothermal-energy.org/pdf/IGAstandard/SGW/1996/Pashkevich.pdf)

Peterman, R. M. 1991. Density-dependent marine processes in North Pacific salmonids: Lessons for experimental design of large-scale manipulations of fish stocks. ICES Marine Science Symposium 192:69-77.

Radchenko, V. I. 1998. Historical trends of fisheries and stock condition of Pacific salmon in Russia. North Pacific Anadromous Fish Commission Bulletin 1:28-37.

Rassadnikov, O. A. 2006. Forecasted and actual catch of salmon in the Far eastern basin in 1993-2006. Bulleten N 1 Realizatsii "KontseptsiiDdalnevostochnoi Basseinovoie programmy izuchenia tikhookeanskikh lososei". Izdatelstvo TINRO-Tsentr. Vladivostok.

Red data book of Kamchatka. 2006. Petropavlovsk-Kamchatka: Kamchatka printing house. Book publishing house. So 1. 272 C.

Ruggerone, G. T., and F. A. Goetz 2004. Survival of Puget Sound Chinook Salmon (Oncorhynchus tshawytscha) in response to climate-induced competition with Pink Salmon (Oncorhynchus gorbuscha). Canadian Journal of Fisheries and Aquatic Sciences 61:1756-1770.

Ruggerone, G. T., and J. L. Nielsen 2004. Evidence for competitive dominance of Pink Salmon (*Oncorhynchus gorbuscha*) over other salmonids in the North Pacific Ocean. Reviews in Fish Biology and Fisheries 14:371-390.

Ruggerone, G. T., E. Farley, J. Nielsen, and P. Hagen 2005. Seasonal marine growth of Bristol Bay Sockeye Salmon (Oncorhynchus nerka) in relation to competition with Asian Pink Salmon (*O. gorbuscha*) and the 1977 ocean regime shift. Fish. Bull. 103:355-370.

Ruggerone, G. T., R. M. Peterman, B. Dorner, and K. W. Myers. 2010. Magnitude and trends in abundance of hatchery and wild Pink, Chum, and Sockeye Salmon in the North Pacific Ocean. Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science 2:306-328.

Ruggerone, G. T., M. Zimmermann, K. W. Myers, J. L. Nielsen, D. E. Rogers. 2003. Competition between Asian Pink Salmon (Oncorhynchus gorbuscha) and Alaskan Sockeye Salmon (O. nerka) in the North Pacific Ocean. Fisheries Oceanography. 12 (3): 209–219,

Salo, E. O. 1991. Life history of Chum Salmon (*Oncorhynchus keta*). Pages 231 to 310 in C. Groot and L. Margolis, editors. Pacific salmon life histories. University of British Columbia Press. Vancouver, British Columbia, Canada.

Sandercock, F. K. 1991. Life history of Coho Salmon (*Oncorhynchus kistuch*). Pages 395 to 446 in C. Groot and L. Margolis, editors. Pacific salmon life histories. University of British Columbia Press. Vancouver, British Columbia, Canada.

Savvaitova, K. A., K. V. Kuzishchin, and S. V. Maximov. 2000. Kamchatka steelhead: population trends and life history variation. Pages 195-203 in E. E. Knudsen, et al. editors. Sustainable fisheries management Pacific salmon. Lewis, Boca Raton LA USA.

Semenov D., Yanislavsky V., Markov P. 2015. Independent Observers Vitiaz-Avto and Delta Fishery Report. Kamchatka Fish Fund. Petropavlovsk-Kamchatsky.

Semko, R. S. 1939. Kamchatka salmon // Izvestia TINRO. T.16. C. 1-111.

Semko, R. S. 1954. Resources of the Western Kamchatka salmon and their commercial use // Izvestia TINRO. The so-41. C. 3-109.

Shevlyakov, E. A. 2006. Resource management of Pacific salmon Oncorhynchus in the Kamchatka region taking into account specificity of multi-species fishery // Voprosy rybolovstva. So 7. №1(25). C. 22-41.

Shevlyakov, E. A. 2013a “Structure and dynamics of illegal coastal fishing of Pacific salmon in Kamchatka region in the modern period”, Rybnoe khoziaistvo 2: 58-64, Internet publication: (http://www.fishkamchatka.ru/?cont=long&id=46534&year=2013&today=31&month=10).

Shevlyakov, E. A. 2013b. Report on grant WWF RU007023-FY13/3/2/ FM/FIP consultant (Stock status of Pacific salmon in the Bolshaya River basin in the modern period). http://www.fishkamchatka.ru/?cont=long&id=46534&year=2013&today=31&month=10.

Shevlyakov E. A., Dubynin V.A. 2004. Effect of abundance of Sea of Okhotsk Alaska Pollock on stocks of Western Kamchatka Pacific salmon. Tezisy dokladov IX Vserossiiskoi konferentsii po problemam rybopromyslovogo prognozirovania. 19-21 oktiabria 2004 g. Murmansk, PINRO. P. 140-141.

Shevlyakov, E. A., Dubynin, V. A., and A. Bugaev. 2011. Improving environmental responsibility of the resource: practical recommendations for implementing principles of sustainable fishery based on voluntary environmental standards for MSC certification. Federal Agency for Fisheries, Kamchatka Research Institute of Fisheries and Oceanography. Report to the World Wildlife Federation (Project WWF19/RU007020/GLM). Petropavlovsk-Kamchatsky.

Shevlyakov, E. A., V. A. Dubynin, M. G. Feldman, L. O. Zavarina, I. V. Tiller, S.V. Shubkin, O. A. Zakharova, O. V. Zikunova N. B. Artyukhina, and V. N. Baeva. 2016. Report under Contract No. 04/15-НИР dated 23.06.2015 Subject: Pacific salmon (Humpback, chum, red, Coho, Chinook) population characteristics, target indexes and harvest management system in certain rivers (Vorovskaya, Kol, Opala, Golygina, Koshegochek, Ozernaya) in West Kamchatka (scientific justification of Pacific salmon harvest certification to MSC standards for Vityaz-Avto LLC and Delta LLC). KamchatNiro, Petropavlosk.

Shevlyakov E. A., Dubynin V.A., Zaporozhets O.M., Golobokova V.N. 2013. Report on the Contract N28/13-BO on topic: scientific support of certification MSC of Bolsheretsk LTD”. KamchatNIRO.

Shevlyakov, E.A., and A. V. Maslov. 2011. Critical rivers for the reproduction of Pacific salmon in Kamchatka, as reference rivers for estimating spawning escapemnt. Izvestia TINRO. T. C. 114-139.

Shevlyakov, E. A., and L. O. Zavarina. 2004. TO the question about the features of population dynamics and methods of forecasting Chum Salmon stocks (*Oncorchynchus keta*) Western Kamchatka) / / Research of aquatic biological resources of the Kamchatka and Northern-Western part of the Pacific Ocean: Sat. scientific papers. Petropavlovsk-Kamchatsky: KamchatNIRO, Vol. 7. C. 181-186.

Shevlyakov, E. A., S. F. Zolotukhin, A. V. Bugaev, A. V. Vinnikov, V. A. Shevlyakov, and S. A. Travin S.A. 2006. Determinant of the main sources of injury of Pacific salmon. - M: Izdatelstvo VNIRO, - 79 C.

Sovremennye problemy lososevykh rybovodnykh zavodov Dalnego Vostoka. Proceedings of international scientific-practical seminar, 30 November – 1 December 2006. Petropavlovsk-Kamchatsky Kamchatrsky Pechatnyi Dvor, p. 237-245.

Temnykh, O. S., A. V. Zavolokin, and M. V. Koval. 2010. Russian Research under the NPAFC Research Plan 2006-2010: A Review and Future Issues. Pacific Research Fisheries Center (TINRO-Center), Vladivostok, Russia. NPAFC Doc. 1238. 23 pp. (Available at www.npafc.org).

Urawa, S., S. Sato, P.A. Crane, B. Agler, R. Josephson, and T. Azumaya. 2009. Stock-specific ocean distribution and migration of Chum Salmon in the Bering Sea and North Pacific Ocean. N. Pac. Anadr. Fish Comm. Bull. 5: 131-146.

Vilenskaya NI, Markevich NB Dynamics of prespawning migration and weight of the eggs of Pacific salmon (Salmonidae) in the system of the Bolshaya-Bystraya Rivers (Western Kamchatka) // Research of aquatic biological resources of the Kamchatka and Northern-Western part of the Pacific Ocean. Collection of scientific works. Vol. 7. Petropavlovsk-Kamchatsky: KamchatNIRO, 2004. C. 142-148.

Vinnikov, A.V., E. A. Shevlyakov, Grohotov, Chrenyshova, E. V. Vinnikov, Y. Denisov, and A. V. Tatarinov. Peculiarities of application of the Olympic system fishing of Pacific salmon on the basin principle in the Kamchatka region in 2010 // Research on water biological resources of the Kamchatka and Northern-Western part of the Pacific Ocean. Sat. nauch. Trudy inst. Kamchatskiy. Research Institute of fish. ec. and Oceanography. Vol. 26. Part 2. 2012. C. 43-46.

Zaporozhets, O. M, E. A. Shevlyakov, and V. Zaporozhets. Population dynamics of Kamchatka salmon with regard to their legal and illegal fishing, Izv. TINRO. 2008. So 153. C. 109-134.

Zaporozhets, O. M, E. A. Shevlyakov, and V. Zaporozhets. Analysis of the population dynamics of Kamchatka salmon in the 20-21 centuries with regard to their legal and illegal seizure // Bulletin №2 (implementation of the «Concept of the far Eastern basin program for the study of Pacific salmon». Publisher: Vladivostok, 2007.

Zaporozhets, O. M, E. A. Shevlyakov, V. Zaporozhets, and N. A. Antonov. 2007. The use of data on illegal catch of Pacific salmon for more exact assessment of their stocks // Voprosy Ikhtiologii Vol. 8, 3(31). C. 471-483.

Zavarina, L.O. About the dynamics of biological indicators and trends of changes in the number of Chum Salmon (*Oncorhynchus keta*) of the Bolshaya River (South-Western Kamchatka) // Research of aquatic biological resources of the Kamchatka and Northern-Western part of the Pacific Ocean. 2010. Vol. 18. C. 38-57.

Zaporozhets G. V., and O. M. Zaporozets. 2011. Lososevye rybovodnye zavody Dalnego Vostoka v ekosistemakh Severnoi Pacifiki. Petropsvlovsk-Kamchatsjy: Kamchatpress, 268 p.

Zavarina, L. O. On the state of stocks of Chum Salmon of the Bolshaya River // Biomonitoring and rat. use of hydrobionts: abstracts. Dokl. Proc. Young scientists. Vladivostok: TINRO-center, 1997. C. 106-107.

Zorbidi, Zh.Kh. Asian stocks of Coho Salmon. Petropavlovsk-Kamchatsky: KamchatNIRO, 2010. 306 S.

Zorbidi, ZH.KH. Commercial value and dynamics of some biological indicators of Coho Salmon Oncorhynchus kisutch Walbaum (Salmonidae) of Kamchatka // Environmental management and management of the marine bioresources: the ecosystem approach: abstracts. Dokl. INTL. proc. Vladivostok: TINRO-Centre, 2003. C. 125-127.

Zorbidi, ZH.KH., N. B. Artyukhina, T. H. Sorokina, and V. A. Peshkurova. Fishing Asian Coho and modern state of the stocks // Research on water biological resources of the Kamchatka and Northern-Western part of the Pacific Ocean. Sat. nauch. Trudy inst. Vol. 9. Petropavlovsk-Kamchatsky: KamchatNIRO, 2007. C. 143-163.

APPENDIX 1 – SCORING AND RATIONALES

Evaluation Table for PI 1.1.1 – Stock status

PI 1.1.1		**The stock management unit (SMU) is at a level which maintains high production and has a low probability of falling below its limit reference point (LRP)**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Stock status**			
	Guidepost	It is **likely** that the SMU is above the limit reference point (LRP).	It is **highly likely** that the SMU is above the LRP.	There is a **high degree of certainty** that the SMU is above the LRP.
	Met?	Yes	Yes	Yes
	Justification	Data on annual escapement and stock productivity demonstrate a high degree of certainty that the wild stock is above the point where recruitment would be impaired by fishing. Current stock-recruitment data demonstrate that escapements of 1 million Sockeye or greater consistently produce high levels of recruitment. The fishery is managed for escapement goals of 1 to 2.3 million specifically in order to avoid recruitment overfishing due to low escapements and density-related reductions in freshwater productivity due to exceeding spawning or rearing habitat capacities. These goals have been met or exceeded for the last 18 years. In this fishery, target reference points based on escapement goals serve as effective operational equivalents of limit reference points. Limit reference points, defined as a point below which all fishing stops, are not specifically established for this fishery but rarely are for salmon except in the case of depleted stocks in mixed stock fisheries. A true limit reference point for salmon, below which reproductive capacity is at risk of impairment, would occur at escapements substantially less than target goal ranges established to produce maximum sustained yield. In the Ozernaya fishery, fishing has been effectively curtailed to meet target goal ranges. Hence, there has been no need to define specific lower thresholds. Similar interpretations of this indicator have been previously applied in other assessments of other salmon fisheries in Alaska and Russia. In summary, SC2.2.3.2 defines a "high degree of certainty" at the SG100 level to mean that the SMU has met its target reference point ≥80% of the last 15 years. Data presented in Table 3 shows that the minimum escapement goal of 1 million sockeye has been exceeded for the last 18 consecutive years which easily meets the SG100 criteria. In one of those, the upper escapement goal of 2.3 million was also exceeded.		
b	**Stock status in relation to target reference point (TRP, e.g. target escapement goal or target harvest rate)**			
	Guidepost		The SMU is at or fluctuating around its TRP.	There is a **high degree of certainty** that the SMU has been fluctuating around its TRP, or has been above its target reference point over recent years.
	Met?		Yes	Yes
	Justification	There is a high degree of certainty that the wild stock has been fluctuating around its target reference point. Target reference points are clearly defined as escapement goals based on weir counts. Escapements consistently meet or exceed goals. Annual escapement is estimated with a high degree of certainty with the counting weir. This method of stock assessment is extremely effective in the Ozernaya system because of the mediating effect of the large lake on streamflow in the Ozernaya River. The lake dampens the effect of daily and seasonal flow patterns which can limit the effectiveness of weirs for counting fish. The clear waters of the system also make visual counting methods effective. Use of the same location and counting methods at the weir over a long period of time also provides a		

PI 1.1.1		The stock management unit (SMU) is at a level which maintains high production and has a low probability of falling below its limit reference point (LRP)		
Scoring Issue		SG 60	SG 80	SG 100
		consistent basis for escapement estimation. The target reference point, defined as an escapement goal range, is specifically designed to produce maximum sustained yield based on the spawner stock-recruitment function. The stock-recruitment analysis uses historical data on run size and age composition to reconstruct brood tables showing the total number of adult progeny produced by a given spawning escapement. MSY escapement levels are identified based on statistical fits of standard nonlinear functions to the available data. The shape of the stock-recruitment, and corresponding estimates of escapements that produce MSY, are related to the biological characteristics of the stock, productivity and capacity of the available spawning and rearing habitat, and survival rates related to conditions during migration and marine portions of the life cycle. Habitat and marine conditions vary from year to year but also vary in broad patterns extending over a decade or more. Therefore, production functions and escapement goals are periodically reviewed and revised as new data becomes available. This has been the case for Ozernaya Sockeye and current goals reflect conditions prevalent for 1995-2009 brood years. Current goals appear to be generally consistent with MSY escapement levels under current conditions based on the available data.		
c	**Status of component populations**			
	Guidepost			The **majority** of component populations in the SMU are within the range of expected variability
	Met?			Yes
	Justification	Discrete populations of Sockeye have not been identified in the Ozernaya system but extensive research and monitoring has demonstrated that this stock is extremely diverse, consisting a variety of subcomponents returning at different times and spawning in different areas and conditions. Early and late stock components are recognized by the management system and there may even be finer distinctions within those, particularly in the late component which comprises the majority of the run (e.g. lake vs. river spawners). Escapement goals have been established for the aggregate run and it is not practical to establish and monitor separate goals for different subcomponents given overlap and annual variability in run timing. However, the importance of protecting all run components is recognized by the management system and current practices are designed to avoid overfishing any specific run component. Guidelines are established and followed for the proportion of the escapements that should be achieved at different points in the run. Progress toward meeting daily and annual targets is monitored and regulated in season based on daily harvest and escapement information. The leading and ending portions of the run are not subject to fishing which also ensures conservation of fish at the ends of the spectrum of diversity. Intensive management to avoid large escapements also protects some early run components from being overspawned by later run components. Passing days are established periodically throughout the run to provide escapement windows for various run components. Escapement estimates throughout the duration of the Sockeye run indicate that the subpopulations of the Ozernaya Sockeye stock are within the range of expected variability. Therefore, the SG100 standard is met.		
References		See Section 3.3. Antonov et al. 2007, Bugaev 1991, 1995, 2011; Bugaev et al. 2001, 2009; Dubynin et al. 2007		

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	Not applicable	Not applicable	Not applicable

PI 1.1.1	The stock management unit (SMU) is at a level which maintains high production and has a low probability of falling below its limit reference point (LRP)		
Scoring Issue	SG 60	SG 80	SG 100
relative to LRP (SI a)			
Reference point used in scoring relative to TRP (SI b)	Escapement Goal	1.0-2.3 million spawners	Goal met or exceeded for 18 consecutive years
OVERALL PERFORMANCE INDICATOR SCORE:			**100**
CONDITION NUMBER (if relevant):			**--**

Evaluation Table for PI 1.1.2 – Stock rebuilding

PI 1.1.2		Where the stock management unit (SMU) 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 SMU **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 SMU.
	Met?	Not applicable		Not applicable
	Justification	The Ozernaya Sockeye SMU is not reduced. This PI is not applicable. In fact, numbers are at near-record highs. Further, a strong stock rebound from a historical period of low escapements, associated with high interception rates in marine drift net fisheries and below-average ocean productivity in the 1960s and 1970s, has demonstrated the high productivity and resilience of this stock.		
b	**Rebuilding evaluation**			
	Guidepost	Monitoring is in place to determine whether the fishery-based rebuilding strategies are effective in rebuilding the SMU within the specified timeframe.	There is **evidence** that the fishery-based rebuilding strategies are being implemented effectively, or it is likely based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the SMU within the specified timeframe.	There is **strong evidence** that the rebuilding strategies are being implemented effectively, or it is highly likely based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the SMU within the specified timeframe.
	Met?	Not applicable	Not applicable	Not applicable
	Justification	See above		
c	**Use of enhancement in stock rebuilding**			
	Guidepost	Enhancement activities are **not routinely used** as a stock rebuilding strategy but may be temporarily in place	Enhancement activities are **very seldom used** as a stock rebuilding strategy.	Enhancement activities are **not used** as a stock rebuilding strategy.

PI 1.1.2		Where the stock management unit (SMU) is reduced, there is evidence of stock rebuilding within a specified timeframe		
		as a conservation measure to preserve or restore wild diversity threatened by human or natural impacts.		
	Met?	Not applicable	Not applicable	Not applicable
	Justification	See above		
References		See Section 3.3		
OVERALL PERFORMANCE INDICATOR SCORE:				**na**
CONDITION NUMBER (if relevant):				**--**

Evaluation Table for 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 SMU management objectives reflected in PI 1.1.1 SG80 including measures that address component population status issues.	The harvest strategy is responsive to the state of the SMU and the elements of the harvest strategy **work together** towards achieving SMU management objectives reflected in PI 1.1.1 SG80 including measures that address component population status issues.	The harvest strategy is responsive to the state of the SMU and is **designed** to achieve SMU management objectives reflected in PI 1.1.1 SG80 including measures that address component population status issues.
	Met?	Yes	Yes	Yes
	Justification	The harvest strategy is responsive to the state of the wild stock and is designed to achieve stock management objectives reflected in wild escapement goals. Annual run size of salmon is often highly variable due to normal variation in environmental conditions which affect reproduction and survival. As a consequence, annual run size is notoriously difficult to forecast which can result in recruitment overfishing or unnecessarily foregone harvest. The harvest strategy for this fishery involves daily assessments of run strength, timing and escapement during the fishing season and closure periods (pass days) for in-river fisheries to ensure that escapement goals are met. Ozernaya sockeye include a less-numerous, early-returning component which spawns in headwater tributaries of Kuril Lake and an abundant later-returning component which spawns in littoral areas of the lake and its outlet. Components overlap somewhat in run timing but daily fish counts at the weir downstream from the lake provide inseason information on the spawning escapement of each component. Separate escapement goals are not specifically identified for each run component but management recognizes the need to provide significant escapements across the breadth of the run and adjusts fishing days inseason to ensure that this occurs. Management, in the form of passing days is always conservative in the early season until run strength can be assessed and escapement goals assured. This affords a high degree of protection of the early-returning tributary spanwers which is by far the smaller of the two major stock components.		

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
		Therefore, the SG100 standard is met.		
b	**Harvest strategy evaluation**			
	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 SMUs at target levels.
	Met?	Yes	Yes	No
	Justification	A consistent pattern of reaching escapement objectives under current conditions of high marine productivity provides evidence that the strategy is achieving objectives. However, the current strategy has not been fully evaluated under a comprehensive suite of conditions including an extended period of reduced marine survival. High productivity and large runs under favorable ocean regimes can compensate for management systems limitations which can create challenges under less favorable ocean productivity regimes. Large numbers also feed high expectations of the fishers. Current high exploitation rates, reductions in escapement goals relative to historical levels, escapements tending toward the lower end of the range, and expansions of processing capacity may all be regarded as symptoms of a narrow safety factor in the management of this fishery.		
c	**Harvest strategy monitoring**			
	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Yes		
	Justification	The fishery and the stock is intensively monitored by catch sampling, escapement assessments and a long-term research program.		
d	**Harvest strategy review**			
	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			Yes
	Justification	The harvest strategy is periodically reviewed and improved as necessary. This work is a joint effort of the government regulatory and scientific agencies and the fishing companies whose long-term leases provide a strong incentive for sustainable management for maximum yield. Recent improvements have included increased local control and authority, increased funding of enforcement and decreased economic incentives for illegal harvest associated with an improving regional economy.		
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	Sharks are not harvested or encountered in this fishery		
f	**Review of alternative measures**			

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
	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?	Not relevant	Not relevant	Not relevant
	Justification	There is no unwanted catch of the target stock.		
References		See Section 3.3. Shevlyakov et al. 2013, 2016		
OVERALL PERFORMANCE INDICATOR SCORE:				**95**
CONDITION NUMBER (if relevant):				**--**

Evaluation Table for 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 which are expected to reduce the exploitation rate as the SMU LRP is approached.	**Well defined** HCRs are in place that ensure that the exploitation rate is reduced as the LRP is approached, are expected to keep the SMU fluctuating around a target level consistent with MSY.	The HCRs are expected to keep the SMU 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?	Yes	Yes	Yes
	Justification	Well defined harvest control rules are in place. Fishing effort is regulated according to escapement to ensure that the stock achieves or exceeds target levels consistent with MSY. Management for MSY escapements ensure that the exploitation rate is reduced long before limit reference points are approached. HCRs include licensing for exclusive use of fishing areas, limitations on numbers and spacing of trap nets in marine waters, and fishery closure days in the river based on real time escapement monitoring data in conjunction with other indicators of run strength and timing based on harvest and biological composition of the harvest. Catch per effort, fish size, and sex ratio are all utilized as indicators. The fishery is managed on a daily basis to regulate harvest consistent with escapement targets. The largely terminal nature of this fishery provides a high degree of control of exploitation in response to actual rather than forecast run strength. The ecological role of the stock is well recognized with extensive historical research on the aquatic and terrestrial ecosystems of Kuril Lake where the large majority of Ozernaya Sockeye spawn and rear.		
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 SMU, and there is evidence that the HCRs are robust to the main uncertainties.
	Met?		Yes	Yes
	Justification	The selection of the harvest control rules takes into account the main uncertainties. These are primarily related to run strength and timing. While run forecasts are made based on brood year escapements and recent production patterns, recommended harvest levels based on these forecasts are utilized primarily as preseason planning tools. Once the fishing season begins, management to control exploitation rates is based on in-season data. Data is referenced to seasonal patterns in previous years to distinguish run timing and strength. Forecasts are typically uncertain and run timing may also vary from year to year. In-season management utilizes indicators based on biological characteristics of the harvest to avoid this potential problem. The previous assessment identified uncertainties related to potential uneven patterns of patterns of exploitation of different portions of the run due in part to the lack of specific escapement objectives for stock subcomponents, trends and variability in interception of Ozernaya Sockeye in marine trap nets north of the Ozernaya area, and trends and variability in the high seas drift net fishery. However, all of these questions were satisfactorily addressed by information provided by KamchatNIRO in subsequent		

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
		surveillances.		
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?	Yes	Yes	Yes
	Justification	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules. Consistent achievement of escapement goals indicates that harvest control rules are generally effective in achieving sustainable exploitation rates defined by the current stock-recruitment data.		
d	**Maintenance of wild population components**			
	Guidepost	It is **likely** that the HCRs and tools are consistent with maintaining the diversity and productivity of the wild component population(s).	It is **highly likely**, that the HCRs and tools are consistent with maintaining the diversity and productivity of the wild component population(s).	There is a **high degree of certainty** that the HCRs and tools are consistent with maintaining the diversity and productivity of the wild component population(s).
	Met?	Yes	Yes	No
	Justification	Discrete populations of Sockeye have not been identified in the Ozernaya system but extensive research and monitoring has demonstrated that this stock is extremely diverse, consisting a variety of subcomponents returning at different times and spawning in different areas and conditions. Early and late stock components are recognized by the management system and there may even be finer distinctions within those, particularly in the late component which comprises the majority of the run (e.g. lake vs. river spawners). The importance of protecting all run components is recognized by the management system and current practices are designed to avoid overfishing any specific run component. Guidelines are established and followed for the proportion of the escapements that should be achieved at different points in the run. Progress toward meeting daily and annual targets is monitored and regulated in season based on daily harvest and escapement information. The leading and ending portions of the run are not subject to fishing which also ensures conservation of fish at the ends of the spectrum of diversity. Intensive management to avoid large escapements also protects some early run components from being overspawned by later run components. Passing days are established periodically throughout the run to provide escapement windows for various run components. Therefore, HCRs and tools based on intensive inseason assessment and management met the SG80 standard. However, the SG100 standard is not met because explicit escapement goals have not been established for different components of the run. Escapement goals have been established for the aggregate run and the KamchatNIRO has indicated that it is not practical to establish and monitor separate goals for different subcomponents given overlap and annual variability in run timing.		
References		See Section 3.3. Shevlyakov et al. 2013, 2016		
OVERALL PERFORMANCE INDICATOR SCORE:				**95**
CONDITION NUMBER (if relevant):				**--**

Evaluation Table for 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 SMU structure, SMU production and fleet composition is available to support the harvest strategy. Indirect or direct information is available on some component populations.	**Sufficient** relevant information related to SMU structure, SMU production, fleet composition and other data is available to support the harvest strategy, including harvests and spawning escapements for a representative range of wild component populations.	A **comprehensive range** of information (on SMU structure, SMU production, fleet composition, SMU abundance, fishery removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available, including estimates of the impacts of fishery harvests on the SMU and the majority of wild component populations.
	Met?	Yes	Yes	Yes
	Justification	A comprehensive range of information including stock structure, productivity, fleet composition and other data is available to support the harvest strategy. Due to their fishery significance and the long-term operation of a research station at Kuril Lake, Ozernaya Sockeye are among the most intensively monitored and studied salmon stocks in the world. Annual harvest of this stock is estimated in the offshore drift net fishery in the Pacific Ocean and Sea of Okhotsk, marine trap net fishery on the west coast of Kamchatka, and the freshwater fishery in the Ozernaya River. Biological data (age, sex, size) is collected from samples of the catch. Spawning escapement is estimated based on weir counts which provide a very high level of accuracy. Biological data is also collected from the escapement. Run timing and spawner distribution are assessed annually. Escapement and run size information is used to derive stock-recruitment production functions which provide of sound basis for establishing escapement targets and exploitation rates consistent with maximum sustained yield. Extensive information is collected on the juvenile life history, abundance, population dynamics, and environmental conditions in Lake Kuril which provides a very strong basis for understanding factors limiting and regulating productivity. Extensive data is also collected on the fishery sector including in-river seine, coastal trap net and high seas drift gillnet fisheries. The available information has been very thoroughly documented in the scientific literature (Bugaev et al. 2009; Bugaev 2011).		
b	Monitoring			
	Guidepost	SMU wild abundance and UoA removals are monitored and at **least one indicator** is available and monitored with sufficient frequency to support the harvest control rule.	SMU wild 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 available and monitored with sufficient frequency to support the harvest control rule.	**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 the information [data] and the robustness of assessment and management to this uncertainty.

PI 1.2.3		Relevant information is collected to support the harvest strategy		
	Met?	Yes	Yes	No
	Justification	Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule. Harvest, data, and biological data are collected daily and have been collected in a standardized manner for many years. This long-term data series provides a very robust basis for evaluation of status and limiting factors of this stock, as well as appropriate fishing strategies. There is good information on commercial fishery removals of this stock in the freshwater in the Ozernaya River fishery, the marine trapnet fishery along the west coast of Kamchatka, and in the offshore drift net fishery operating in the Russian EEZ. Historical data in offshore drift net fishery and illegal harvest in freshwater was likely incomplete but current numbers are reported by KamchatNIRO to be accurate with respect to Ozernaya Sockeye. Shevlyakov 2013a reported that illegal harvest has been reduced to low levels in the last decade. The offshore drift gillnet fishery has been substantially reduced by regulation in recent years. Therefore, the fishery clearly meets the SG80 criteria for this indicator. However, the SG100 is not achieved due to management uncertainties introduced by the location of the fish counting weir well upstream from the fishery location. KamchatNIRO reports that a travel time of several days between the fishery and the counting weir can introduce uncertainty in fishery management in some years depending on migration patterns. As a result, optimum harvest efficiencies are not always realized. Fishery managers are implementing an Alaska-style sonar counting system immediately upstream from the fishery to provide more real-time data.		
c	**Comprehensiveness of information**			
	Guidepost		There is good information on all other fishery removals from the SMU.	
	Met?		Yes	
	Justification	Data were provided documenting estimates of high seas drift net harvest of Ozernaya Sockeye in the Russian Exclusive Economic Zone fisheries from 2000 through 2014. This fishery is subject to annual assessments by the governmental regulatory agencies. The marine drift net fishery in Russian waters was permanently closed by the government in 2015. Interceptions of Ozernaya Sockeye in marine trapnet fisheries north of the Ozernaya River are also assessed by the management system. Ozernaya Sockeye comprise an increasing percentage of the Sockeye harvest from the Bolshaya River southward. While historical levels of illegal harvest have not been documented, KamchatNIRO has provided more recent estimates. Fishing companies, governmental agencies and environmental stakeholders all report that illegal harvest of Ozernaya Sockeye has been largely controlled by current enforcement efforts. The unique situation of the Ozernaya, including lack of access to this remote area and protection of the spawning grounds by a national park, has made these efforts effective. A consistent supply of salmon from legal fishing companies, current low prices for salmon, high costs of helicopter access, extensive enforcement activities, and penalties have effectively eliminated financial incentives for large scale illegal fishing for salmon in remote areas such as the Ozernaya. An independent observer program is being implemented in cooperation with the fishing companies, the WWF and the Kamchatka State Technical University. A pilot effort was conducted in 2013 and 2014 involving observers under the supervision of Denis Semenov of the WWF. Two student observers participated in the program each year for two weeks during the peak of the fishing season. Students observed effort and catch by river nets, documented observations and prepared a report. The observer program continued in 2015		

PI 1.2.3		Relevant information is collected to support the harvest strategy	
		and 2016 with refinements in methodology (Semenov et al. 2016, KFF 2017). Information on current harvest in offshore driftnet and other nearshore coastal trapnet fisheries north of the Ozernaya area is adequate to meet the 80 scoring criteria for this indicator. The independent observer program confirmed a low incidence of unaccounted illegal harvest.	
References		See Section 3.3. Antonov et al. 2007, Bugaev 1991, 1995, 2011; Bugaev et al. 2001, 2009; Dubynin et al. 2007; Shevlyakov et al. 2013, 2016	
OVERALL PERFORMANCE INDICATOR SCORE:			**90**
CONDITION NUMBER (if relevant):			**--**

Evaluation Table for PI 1.2.4 – Assessment of stock status

PI 1.2.4		There is an adequate assessment of the stock status of the SMU		
Scoring Issue		SG 60	SG 80	SG 100
A	**Appropriateness of assessment to stock under consideration**			
	Guidepost		The assessment **is appropriate** for the SMU 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?		Yes	Yes
	Justification	The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery. Status is evaluated based on weir counts which provide very accurate estimates of abundance on the majority of the spawning grounds. Reference points are defined based on escapement goals demonstrated to be appropriate for this stock. Harvest is controlled in-season based on real-time data on spawning escapement as well as numbers and characteristics of fish entering the fishery. Extensive information on life history dynamics, ecological interactions, and ecosystem conditions is also being collected by a long-term research program at Kuril Lake.		
B	**Assessment approach**			
	Guidepost	The assessment estimates stock status relative to generic reference points appropriate to salmon.	The assessment estimates stock status relative to reference points that are appropriate to the SMU and can be estimated.	The assessment estimates with a high level of confidence both stock status and reference points that are appropriate to the SMU and its wild component populations.
	Met?	Yes	Yes	No
	Justification	The assessment estimates stock status relative to target reference points derived from stock-recruitment data collected at a weir between the fishing area and the large majority of the spawning grounds. A long-term dataset is available and escapement goals have been revised based on historical changes in productivity. The fishing weir and terminal harvest strategies afford high confidence in the accuracy of both escapement and removals. Therefore, the fishery meets the 80-scoring standard for this guidepost. Target reference points are defined in terms of escapement goals as measured by fish counts in a weir downstream from the primary spawning grounds in Kuril Lake and its tributaries. Goals are derived from stock-recruitment analysis of recent historical data.		

PI 1.2.4		There is an adequate assessment of the stock status of the SMU
		Goals are represented as a range that will avoid recruitment overfishing due to low escapements and density-related reductions in freshwater productivity due to exceeding spawning or rearing habitat capacities. Stock-recruitment analyses are the standard approach and have proven very effective for estimating target reference points for salmon in single stock terminal fisheries like the Ozernaya. The entire escapement consists of wild fish – no hatcheries are operated in or near the Ozernaya system. Escapements can be estimated with high confidence based on weir counts – this assures that there is relatively little measurement error in derivation of the production function or assessments of whether goals are being met. The target reference point, defined as an escapement goal range, is specifically designed to produce maximum sustained yield based on the spawner stock-recruitment function. The stock-recruitment analysis uses historical data on run size and age composition to reconstruct brood tables showing the total number of adult progeny produced by a given spawning escapement. MSY escapement levels are identified based on statistical fits of standard nonlinear functions to the available data. The shape of the stock-recruitment, and corresponding estimates of escapements that produce MSY, are related to the biological characteristics of the stock, productivity and capacity of the available spawning and rearing habitat, and survival rates related to conditions during migration and marine portions of the life cycle. Habitat and marine conditions vary from year to year but also vary in broad patterns extending over a decade or more. Therefore, production functions and escapement goals are periodically reviewed and revised as new data becomes available. This has been the case for Ozernaya Sockeye and current goals reflect conditions prevalent for 1995-2005 brood years. Current goals appear to be generally consistent with MSY escapement levels under current conditions based on the available data. The SG100 standard is not met due to lingering uncertainty regarding the nature of the production curve under the favorable marine survival regime that currently prevails and some of the highest fishery exploitation rates documented for any Sockeye Salmon stock in the Pacific. Recent high returns from escapements of 2.6 and 4.9 million would appear to corroborate the previous suggestion by the assessment team that the current escapement goals underestimate optimum escapement levels for Ozernaya Sockeye. The 4.9 million escapement in 2007 was associated with record returns in 2011-2013. Lacking evidence of changes in freshwater productivity, this information along with stock-recruitment analysis theory indicate that the current KamchatNIRO analysis produced a lower escapement goal than that which would be produced if additional data were available on larger escapements. The available data were skewed to lower escapement numbers in which moderate to high escapements were not represented in the dataset. This lack of contrast in the range of spawning escapements represents a significant violation of the assumptions of the Ricker analysis. Higher escapement goals would also be consistent with historical data on the stock-recruitment relationship under lower marine survival prevalent before 1994. Recalculation of the stock-recruitment function with current data would clearly result in an increase of estimated escapements that produce maximum yield. However, the KamchatNIRO has deferred an update of this analysis for the reasons given above under 'Evidence.' As a result, it is possible that this fishery appears to be foregoing consistently greater yields that would be expected by managing for higher escapements. The stock is also subject to very high annual exploitation rates (80-88%), particularly in years of large returns. These high rates have the potential to reduce the inherent stock diversity if they are unevenly distributed on component substocks. In light of the decision by the governmental scientific deferring reanalysis of new information on stock-recruitment patterns and goals, the assessment team considered the corresponding risks. A primary concern is for the potential to overfish stock subcomponents to a point where

PI 1.2.4		There is an adequate assessment of the stock status of the SMU		
		they are substantially under-represented to the aggregate return relative to historical levels or, worse, to low levels which might begin to constitute a conservation concern. However, current fishery information obtained following the assessment provides no indication that specific stock subcomponents are being consistently overfished. The primary subcomponent of concern would be the early portion of the run that spawns in tributary streams of Kuril Lake. This subcomponent is estimated to comprise only about 3% of the total return, which is dominated by fish spawning in the lake and river outlet. The early run component is protected by current fishing practices which typically allow for greater escapement on the front of the run to ensure that minimum escapement goals will be met. Fishery liberalization typically occurs on the later part of the run after it is clear that escapement goals will be achieved. In addition, while discrete management objectives are not defined for the early run, the filling of their spawning grounds is monitored each year and considered by the fishery managers. Therefore, we conclude that failure to increase escapement goals based on current information likely does not pose a significant risk to the early run subcomponent. Another significant risk is the potential for failure to meet current minimum escapement goals due to fishery management errors in recognizing and responding to highly variable fish numbers and return timing. Current data shows that minimum escapement goals of 1 million Sockeye have been achieved every year since 1999. However, fishery processing capacity has substantially expanded over the last 10 years in response to consistently high returns and this fishery is extremely valuable. Increasing escapement goals and corresponding yields might result in even greater expansions of the fishery with concomitant expectations and demands to continue to fish at high rates to maintain catches necessary to provide returns for new catching and processing capacity. Productivity of Ozernaya Sockeye is currently at record high levels due to a favorable marine productivity regime and limitations on high seas interception fisheries. At some point, marine conditions will likely cycle back to a lower productivity regime, which might make it even harder to restrict the in-river fisheries if demand was increased to even higher levels than they are currently. The assessment team has concluded that the outcome of the decision not to increase escapement goals based on new data does not constitute a risk to high sustainable yield from either a biological or economic perspective. Foregoing higher yields in the interim will reduce the risk of continuing high demands in the event of a downturn in marine productivity. While lower goals appear to be foregoing higher yields during current conditions, they also avoid additional economic investments in developing even more processing capacity which could be stranded when a downturn in productivity occurs. The surveillance team also considered the potential for incidental impacts of current high fishing rates for Sockeye on other fish species in the Ozernaya. However, no substantial risk was identified because the Sockeye fishery is concentrated during a period outside the return period of other species, including salmon.		
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?	Yes	Yes	No
	Justification	The assessment takes into uncertainty into account uncertainty but does not evaluate stock status relative to reference points in a probabilistic way. Uncertainty in estimates of various biological parameters is regularly represented with statistical confidence intervals or qualified descriptively. However, probabilistic risk analyses of stock status and fishery effects have not been extensively employed to evaluate population risks of measurement		

PI 1.2.4		There is an adequate assessment of the stock status of the SMU		
		error, normal variation in productivity, or long term productivity trends or changes.		
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?			Yes
	Justification	The regional scientific agency has conducted extensive assessments of alternative hypotheses and assessment approaches. Uncertainties regarding effects of increasing productivity under currently-favorable marine survival conditions were assessed based on limnology and juvenile growth, condition and survival in relation to rearing density and environmental conditions. Uncertainties regarding the accuracy of spawning escapement estimates and corresponding production function relationships is being assessed using new sonar estimates of escapement past the fishing areas (Shevlyakov et all 2013, 2016). Therefore, the assessment has been tested and shown to be robust and alternative hypotheses and assessment approaches have been rigorously explored, thus the SG100 is met for this scoring issue.		
E	**Peer review of assessment**			
	Guidepost		The assessment of SMU status, including the choice of indicator populations and methods for evaluating wild salmon in enhanced fisheries is subject to peer review.	The assessment, including design for using indicator populations and methods for evaluating wild salmon in enhanced fisheries, has been **internally and externally** peer reviewed.
	Met?		Yes	Yes
	Justification	Assessments have been subjected to extensive internal and external peer review through the governmental scientific agency and by extensive publication in the technical scientific literature (e.g., Antonov et al. 2007, Bugaev 1991, 1995, 2011; Bugaev et al. 2001, 2009; Dubynin et al. 2007; Shevlyakov et al. 2013, 2016).		
f	**Representativeness of indicator populations**			
	Guidepost	Where indicator stocks are used as the primary source of information for making management decisions on SMUs, there is **some scientific basis** for the indicators selection.	Where indicator stocks are used as the primary source of information for making management decisions on SMUs, there is **some evidence of coherence** between the status of the indicator streams and the status of the other populations they represent within the management unit, including selection of indicator stocks with low productivity (i.e., those with a higher conservation risk) to match those of the representative SMU where	Where indicator stocks are used as the primary source of information for making management decisions on SMUs, the status of the indicator streams are **well correlated** with other populations they represent within the management unit, including stocks with lower productivity (i.e., those with a higher conservation risk).

PI 1.2.4		There is an adequate assessment of the stock status of the SMU		
			applicable.	
	Met?	Yes	Yes	Yes
	Justification	Guideposts related to indicator stocks are not applicable. The entire Ozernaya Sockeye stock is assessed. Indicator stocks are not utilized.		
g	**Definition of Stock Management Units (SMUs)**			
	Guidepost	The majority of SMUs are defined with a clear rationale for conservation, fishery management and stock assessment requirements.	The SMUs are **well-defined** and include definitions of the major populations with a clear rationale for conservation, fishery management and stock assessment requirements.	There is an **unambiguous description** of each SMU that may include the geographic location, run timing, migration patterns, and/or genetics of component populations with a clear rationale for conservation, fishery management and stock assessment requirements.
	Met?	Yes	Yes	Yes
	Justification	There is no ambiguity in the description of this stock. Its geographic location, run timing, and component stocks are thoroughly described and documented. This is a terminal fishery on a single stock of Sockeye originating entirely the Ozernaya River. Clear rationales for conservation, fishery management and stock assessment requirements are very thoroughly described and documented (Bugaev et al. 2009; Bugaev 2011). Therefore, the 100 standard is met for this SG		
References		See Section 3.3. Antonov et al. 2007, Bugaev 1991, 1995, 2011; Bugaev et al. 2001, 2009; Dubynin et al. 2007; Shevlyakov et al. 2013, 2016; Koval et al. 2014; Ostroumov 1964		
OVERALL PERFORMANCE INDICATOR SCORE:				**95**
CONDITION NUMBER (if relevant):				**--**

Evaluation table for PI 1.3.1 – Enhancement outcomes

PI 1.3.1		Enhancement activities do not negatively impact wild stock(s)		
Scoring Issue		SG 60	SG 80	SG 100
a	**Enhancement impacts**			
	Guidepost	It is **likely** that the enhancement activities do not have significant negative impacts on the local adaptation, reproductive performance or productivity and diversity of wild stocks.	It is **highly likely** that the enhancement activities do not have significant negative impacts on the local adaptation, reproductive performance or productivity and diversity of wild stocks.	There is a **high degree of certainty** that the enhancement activities do not have significant negative impacts on the local adaptation, reproductive performance or productivity and diversity of wild stocks.
	Met?	Yes	Yes	Yes
	Justification	No hatchery enhancement of Sockeye Salmon occurs in unit of certification systems.		
References				

PI 1.3.1	Enhancement activities do not negatively impact wild stock(s)
OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER (if relevant):	**--**

Evaluation table for PI 1.3.2 – Enhancement management

PI 1.3.2		Effective enhancement and fishery strategies are in place to address effects of enhancement activities on wild stock(s).		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guidepost	**Practices and protocols** are in place to protect wild stocks from significant negative impacts of enhancement.	There is a **partial strategy** in place to protect wild stocks from significant negative impacts of enhancement.	There is a **comprehensive strategy** in place to protect wild stocks from significant negative impacts of enhancement.
	Met?	Yes	Yes	Yes
	Justification	No hatchery enhancement of Sockeye Salmon occurs in unit of certification systems.		
b	Management strategy evaluation			
	Guidepost	The practices and protocols in place are **considered likely** to be effective based on plausible argument.	There is **some objective basis for confidence** that the strategy is effective, based on evidence that the strategy is achieving the outcome metrics used to define the minimum detrimental impacts.	There is **clear evidence** that the comprehensive strategy is successfully protecting wild stocks from significant detrimental impacts of enhancement.
	Met?	Yes	Yes	Yes
	Justification	No hatchery enhancement of Sockeye Salmon occurs in unit of certification systems.		
References				
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				

Evaluation table for PI 1.3.3 – Enhancement information

PI 1.3.3		Relevant information is collected and assessments are adequate to determine the effect of enhancement activities on wild stock(s).		
Scoring Issue		SG 60	SG 80	SG 100
a	**Information adequacy**			
	Guidepost	**Some** relevant information is available on the contribution of enhanced fish to the fishery harvest, total escapement (wild plus enhanced), and hatchery broodstock.	**Sufficient** relevant qualitative and quantitative information is available on the contribution of enhanced fish to the fishery harvest, total escapement (wild plus enhanced) and hatchery broodstock.	A **comprehensive range** of relevant quantitative information is available on the contribution of enhanced fish to the fishery harvest, total escapement (wild plus enhanced) and hatchery broodstock.
	Met?	Yes	Yes	Yes
	Justification	No hatchery enhancement of Sockeye Salmon occurs in unit of certification systems.		
b	**Use of information in assessment**			
	Guidepost	The effect of enhancement activities on wild stock status, productivity and diversity are taken into account qualitatively.	A **moderate-level analysis** of relevant information is conducted and used by decision makers to quantitatively estimate the impact of enhancement activities on wild-stock status, productivity, and diversity.	A **comprehensive analysis** of relevant information is conducted and routinely used by decision makers to determine, with a high degree of certainty, the quantitative impact of enhancement activities on wild-stock status, productivity, and diversity.
	Met?	Yes	Yes	Yes
	Justification	No hatchery enhancement of Sockeye Salmon occurs in unit of certification systems.		
References				
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				

APPENDIX 2 – PEER REVIEW REPORTS

Overall Opinion

Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?	**Yes**	**Conformity Assessment Body Response**
Justification: Scope was limited to P1 and only applied to Ozernaya sockeye salmon. A number of conditions from the initial assessment have been previously met. In general, the sockeye fishery is well managed, and this management facilitated by the lack of sockeye enhancement that can complicate management of wild salmon. A weir is used to count spawning escapement, and a harvest control rule provides the means for achieving escapement goals. I agree with the assessment team that the spawner recruit relationship may indicate a higher MSY escapement than currently used. This is not a sustainability issue but it is possible that yield could be higher and higher escapements could provide more food for wildlife and more nutrients for zooplankton, a Principle 2 issue. A sonar will be installed to count escapement closer to the fishery. It is important that the weir continue to operate because weir counts are typically much more accurate than sonar counts. However, as noted below, Ozernaya sockeye show an unusually high average return per spawner, which leads me to wonder if the weir may be missing some spawners.		*No revision required. Addition of a sonar counter in the lower river downstream from the weir may provide an opportunity in the future to assess the accuracy of current estimates of spawner abundance downstream from the counting weir at the mouth of Kuril Lake and to assess the accuracy of estimated returns per spawner.*

Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?	**NA**	**Conformity Assessment Body Response**
Justification: No conditions were identified as none are needed.		*None required*

If included:

Do you think the client action plan is sufficient to close the conditions raised?	**NA**	**Conformity Assessment Body Response**
Justification: Client action plan is not needed because there are no conditions. However, I recommend that the managers conduct a comprehensive analysis and synthesis of available adult data, juvenile sockeye data, and limnology to better understand escapement goals that lead to MSY. Furthermore, managers should consider an experimental adaptive management approach whereby they periodically allow higher spawning escapements to test the extent to which greater spawner abundances lead to greater adult returns and harvests, as indicated by one recent large escapement.		*Owing to the high value of this fishery, a comprehensive stock assessment including adults, juveniles and limnology is conducted annually and used to regularly update management information.* *The primary uncertainty concerns how productivity of Kuril Lake might be changing as a result of climate change (e.g., warmer winters, reduced ice cover, corresponding limnological changes).*

General Comments on the Assessment Report (optional)

Performance Indicator Review

Performance Indicator	Has all the relevant information available been used to score this Indicator?	Does the information and/or rationale used to score this Indicator support the given score?	Will the condition(s) raised improve the fishery's performance to the SG80 level?	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.1	Yes	Partially	NA	The text claims that escapement is measured with a high degree of certainty via weir. Weir counts are typically highly accurate unless some fish escape under the weir or pass when counting has ceased. I raise the issue of aqccuracy because the average R/S of this stock is exceptionally high, and higher than most, if not all, sockeye stocks in Alaska. In Alaska, some stocks may have unusually high R/S but this is caused by underestimation of spawning escapement (or mis-allocation of catch). The text also indicates that the TRP is designed to produce MSY based on the stock-recruitment analysis. No analysis is provided but a visual interpretation of the spawner recruit relationship in Fig. 7 indicates spawning escapement leading to MSY is higher than 1-2.3 million fish. Based on the curve shown in the graph, MSY escapement would be closer to about 3	*The current escapement goal is based on KamchatNIRO analysis of the stock-recruitment data presented in Figure 7.* *KamchatNIRO has acknowledged the increase in productivity under current conditions but has also elected not to futher increase escapement goals out of concern for the risk of overseeding the available rearing habitat during a period of climate uncertainty. KamchatNIRO has advised that "Complex analysis of results obtained through hydro-meteorological observations in the basin of*

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				million spawners. This potential goal is higher than all but one escapement in the recent period. The goal prior to the mid-1990s was 2.5-3.5 million sockeye. No reason was stated for the reduction in the escapement goal. The issue raised here is not a sockeye sustainability issue, rather it simply raises the question of whether harvests are as high as the might be. If the true MSY escapement is closer to 3 million spawners, then an ecosystem (Principle 2) concern might be raised because spawners provide important food for wildlife and nutrients for plankton. The text claims that good monitoring of the lake occurs (previous condition 8) but key findings from this monitoring in terms of juvenile sockeye and zooplankton was not presented.	*the Kuril lake showed that the warming has been intensified in the lake basin in the recent decades, beginning from 2000s. It was accompanied by the increase of precipitation and wind. The complex impact of these climate factors caused the increase of temperature and water content in the rivers of this basin, as well as the temperature in the lake pelagic zone. The latter caused hydro-chemical background change and the change in phyto-, micro-, and zooplankton structure and qualitative indicators, ichthyocenosis structure."*
1.1.2	Yes	Yes	NA	No depleted stocks	*None required*

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1.1.3				There is no 1.1.3	*None required*
1.2.1	Yes	Yes	NA	The harvest strategy for this fishery involves daily assessments of run strength, timing and escapement during the fishing season and closure periods (pass days) for in-river fisheries to ensure that escapement goals are met. The text also warns about escapements tending to be near the lower benchmark.	*None required*
1.2.2	Yes	Yes	NA	The fishing season begins with a pattern of 2 days open, then 2 days closed while evaluating daily escapemetn at the weir. Modifications to the fishery are made accordingly in order to meet the aggregate spawning goal. Current escapement goals are typically met. The harvest control rules should be adequate to maintain diversity of component populations, although a reduction in the high exploitation rates would be beneficial as suggested by the assessment team.	*None required*
1.2.3	Mostly	Partial	NA	The text claims *"Ozernaya Sockeye are*	*KamchatNIRO reports*

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				among the most intensively monitored and studied salmon stocks in the world." However, my understanding is that Ozernaya sockeye smolt size at age has declined, there is concern about why this is happening, and yet there is insufficient research to evaluate the juvenile sockeye problem, e.g., see the 4th surveilance audit. Adult salmon monitoring appears to be adequate. The text indicates a sonar will be installed downstream from the weir and closer to the fishery. The weir should NOT be removed because weir counts are typically much more accurate than sonar counts. What methods are used to identify Ozernaya sockeye in the Bolshaya area?	*"Since 2014 there has been a drastic decrease in mass of downstream salmon fries of age 2+ that was accompanied with the decrease of zooplankton biomass down to the low levels that were typical for "cold" 1990s."* *The sonar counter will supplement rather than replace the weir and there have been no plans made to remove the weir.* *Ozernaya sockeye in Bolshaya area marine harvests are distingished from other Bolshaya sockeye based on a combaination of age, size and sex information from the catch and escapement.*
1.2.4	Yes	Yes	NA	The text adequately describes the	*Shevlyakov et al. (2013,*

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				assessment process. As suggested by the text, the managers should comprehensively evaluate spawning escapements leading to MSY while also investigating density dependence during the lake rearing stage. Note: I was not able to access Shevlyakov et al. (2014, 2016); these key report should be made available to the public. I agree with the text, "Recent high returns from escapements of 2.6 and 4.9 million would appear to corroborate the previous suggestion by the assessment team that the current escapement goals underestimate optimum escapement levels for Ozernaya Sockeye. The 4.9 million escapement in 2007 was associated with record returns in 2011-2013. As a result, it is possible that this fishery appears to be foregoing consistently greater yields that would be expected by managing for higher escapements."	*2016) are reports by KamchatNIRO prepared under contract by the fishery client to address questions related to this certification of west Kamchatka fisheries. These reports are available upon request to the CAB.*
1.3.1	Yes	Yes	NA	No hatchery enhancement of Sockeye Salmon occurs in unit of certification	*None required*

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1.3.2	Yes	Yes	NA	No hatchery enhancement of Sockeye Salmon occurs in unit of certification	*None required*
1.3.3	Yes	Yes	NA	No hatchery enhancement of Sockeye Salmon occurs in unit of certification	*None required*

Any Other Comments

Comments	Conformity Assessment Body Response
The text should have explained why an expedited audit of the Ozernaya Sockeye fishery was conducted in 2017 as a scope extension of the West Kamchatka certification, in lieu of a full reassessment. I was initially confused because I knew Ozernaya had been previously certified. Later I found out that the reason for the expedited review was because Ozernaya sockeye needed to be re-certified and the goal was to combine it with pink and chum salmon certification.	*Additional explanation was added to the executive summary to this effect.*

APPENDIX 3 – STAKEHOLDER SUBMISSIONS

The following table comprises the stakeholder comments received from the MSC during the public comment period, and the responses of the assessment team. No other stakeholder submissions were received.

PageReference	Grade	RequirementVersion	OversightDescription	Pi	CABComment
47-48	Minor	FCR-7.10.6.2 v2.0	PI 1.1.1 SI (b). The rationale mentions that escapement consistently meets or exceeds goals. However, it is not clear how there is a high degree of certainty that this is occurring, as required at SG100 and outlined in SC2.2.3.2.	1.1.1	SC2.2.3.2 defines a "high degree of certainty" at the SG100 level to mean that the SMU has met its target reference point ≥80% of the last 15 years. Data presented in Table 3 shows that the minimum escapement goal of 1 million sockeye has been exceeded for the last 18 consecutive years which easily meets the SG100 criteria. In one of those, the upper escapement goal of 2.3 million was also exceeded. However, escapements exceeding the upper goal represent a loss of yield rather than a sustainable production concern. The rationale has been amended to make this more explicit. No score changes have been made.
50	Major	FCR-7.10.6.1 v2.0	PI 1.2.1 SI (a). It is not clear if the assessment team evaluated whether the fishery managers attempt to minimize harvest of any weak component population(s) within the SMU through differential harvest per SC2.4.1.	1.2.1	Ozernaya sockeye include a less-numerous, early-returning component which spawns in headwater tributaries of Kuril Lake and an abundant later-returning component which spawns in littoral areas of the lake and its outlet. Components overlap somewhat in run timing but daily fish counts at the weir downstream from the lake provide inseason information on the spawning escapement of each component. Separate escapement goals are not specifically identified for each run component but management recognizes the need to provide significant escapements across the breadth of the run and adjusts fishing days inseason to ensure that this occurs. Management, in the form of passing days is always conservative in the early season until run strength can be assessed and escapement goals assured. This affords a high degree of protection of the early-returning tributary spanwers which is by far the smaller of the two major stock components. The rationale has been amended to ensure this is now clear. There has been no change to the score.

59	Guidance	FCR-7.10.6.1 v2.0	PI 1.2.4 SI (d). References are provided but the rationale should state how these references address the scoring guidepost and not simply the verbatim language from the scoring guidepost. Please elaborate further to support how SG100 is met.	1.2.4	The regional scientific agency has conducted extensive assessments of alternative hypotheses and assessment approaches. Uncertainties regarding effects of increasing productivity under currently-favorable marine survival conditions were assessed based on limnology and juvenile growth, condition and survival in relation to rearing density and environmental conditions. Uncertainties regarding the accuracy of spawning escapement estimates and corresponding production function relationships is being assessed using new sonar estimates of escapement past the fishing areas. This text has been added to the rationale for this scoring issue. No change to the score has been made.

APPENDIX 4 – SURVEILLANCE FREQUENCY

Annual surveillance of the Ozernaya Sockeye fishery will be conducted as part of the VA-Delta West Kamchatka salmon fishery surveillance (identified below).

Table 12. Timing of surveillance audit

Year	Anniversary date of certificate	Proposed date of surveillance audit	Rationale
1	Sept 2017	May 2017	Previous year's fishery information will be available and precedes current year fishery
2	Sept 2018	May 2018	
3	Sept 2019	May 2019	
4	Sept 2020	May 2020	

Table 13. Fishery Surveillance Program

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