

Surveillance Report Lake Hjälmaren pikeperch fish-trap and gillnet fisheries

Certificate No.: MML-FC-012 / MML-FC-013

Moody Marine Ltd. August 2007

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1.0 GENERAL INFORMATION

Scope against which the surveillance is undertaken: MSC Principles and Criteria for Sustainable Fishing as applied to the Lake Hjälmaren pikeperch fish trap and gillnet fisheries.

Species: Pikeperch (Sander lucioperca)

Area: Lake Hjälmaren, Sweden

Method of capture: Fish trap and gillnet

| Date of Surveillance Visit: | 31 July - 1 August 2007 | | | |
|-----------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------|----------------------------------------------------|-----|
| Initial Certification | Date: 7 August 2006 | | Certificate Ref: MML-FC-012 / MML-FC-013 | |
| Surveillance stage | 1st | 2nd | 3rd | 4th |
| Surveillance team: | Lead Assessor: Assessor: | Andrew Hough Stig Tuene | | |
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2.0 RESULTS, CONCLUSIONS AND RECOMMENDATIONS

This report contains the findings of the first surveillance audit in relation to this fishery which took place 31 July and 1 August, 2007. This report concentrates on the compliance of fishery managers with the Conditions of Certification set out in the original certification report. As conditions are closed out (i.e. actions are completed), the assessment focus will concentrate more and more on the overall ongoing operation of the fishery in relation to the MSC Principles and Criteria.

Information has been collected from statistics provided by the Swedish National Board of Fisheries (NBF), and meetings with Per Nyberg and fishermen.

As part of Moody Marine's plan to provide local auditors to fisheries (minimising costs and providing better understanding of language and local issues), the coordinating auditor for this audit was Stig Tuene. Stig's experience in Norway includes the Institute of Marine Research (1988-1998), Møre Research Ålesund (1998-2006) and from 2006 with Moody International as an auditor. His main research field has been the relationship between feeding and growth of fish. He has a Cand. Scient. thesis on feeding ecology of fish in the Norwegian Deeps and a total of about 15 years experience as fishery scientist.

Five conditions were set at the initial certification, identical between the two fisheries (fish trap and gill-net). The response by NBF/ County Administrative Boards (CAB) to Conditions of Certification has been reproduced below as appropriate. For each condition, the report sets out progress to date. This progress has now been evaluated by the Moody Marine assessment team ('Observations' and 'Conclusion') against the commitments made in the Action Plan. This evaluation includes a re-evaluation of the scoring allocated to the relevant Performance Indicators in the original MSC assessment. Where the requirements of a condition are met, the Performance Indicators are re-scored and if the score is 80 or more, then the condition is closed.

The effects of any overall legislative and management changes in the fishery are also taken into consideration.

| Item | Comments |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Condition of Certification 1: Reference levels and Decision rules |
| Activity assessed | There is an ongoing, implicit, analysis of stock status relative to historical information which allows forecasts to be made for the pikeperch stock and management actions to be taken. However, there are no formalised reference/action points nor a documented, agreed, action plan (decision rules) to be put in place as and when stock levels reach such reference levels. |
| | This is potentially problematic if additional licensed gears, not currently used, were to be activated, thereby increasing total effort. |
| | Management agencies shall formalise appropriate reference level(s) and corresponding actions. Agencies may wish to consider an approach based upon precautionary and limit reference levels. |
| | Timescale : Current data on future recruitment indicates an ongoing healthy pikeperch population for at least 2-3 years. Draft reference levels and corresponding action plans should be prepared within 18 months of certification. These should then be agreed and formalised within 9 months of preparation. Reference levels and corresponding action plans should therefore be available within 27 months of certification, allowing development during a period of healthy stock status. |
| | Relevant Scoring Indicators : 1.1.3.2, 1.1.3.3, 1.1.3.5, 3A.3.1, 3A.3.2, 3A.6.2 |
| NBF/CAB Action Plan | Seven fishermen have counted the catch of 3-summer old pikeperch in fish-traps all over the lake during August since 1993, except for 1996. This gives a recruitment index with small confidence limits. The year class that hatched in 2001 was the richest year class among the year classes 1991-2003. From this index it is possible to forecast the commercial catch 3-5 years later. This index shows no correlation with the spawning stock, as indicated by the commercial catch the year prior to spawning. Until the year class in 2001, there was a positive correlation with water temperature during summer and autumn. The reason why no correlation was found for the year classes 2002 and 2003 probably depends on the fact that the year class 2001 was so rich that cannibalism occurred in the population. This will reduce recruitment. If the recruitment index is below a certain value during a number of years, it is possible to restrict the fishery. The best way of doing so is probably not to replace fishermen who retire. This may take some time, but as the warning signal will appear 3-5 years before the year of catch, a number of fishermen may retire during that period. During the next 12 months we will discuss at what value of the recruitment index and after how many years of low recruitment the fishery should be restricted. The number of licensed gears currently not in use will also be restricted so as to prevent an increased effort if the population decreases. An upper limit for the maximum length of gill-nets in the whole lake will also be set. These measures will be decided in co-operation with CAB, which distributes licenses for all kinds of fishing gear to fishermen who have received their fishing licenses from SBF. |
| | After another two years of monitoring three summer old pikeperch caught in fish-traps, an even better recruitment index and a better correlation with the commercial catch and spawning stock (as indicated by the catch the year prior to spawning) will have been obtained. After that period, decisions of the reference level and corresponding action plans may be taken. This will be done within 18 months of certification. It seems unlikely however that the spawning stock could be reduced by the fishery to such a degree that the recruitment and year class strength will be affected. The minimum allowable size (45 cm) and the fact that pikeperch caught in gill-nets have a length of at least 50 cm, means that most females have had the possibility to spawn twice before they may be caught. |
| | Discussions continue concerning the decision rules. Work progress on this condition appears to be on schedule (or slightly behind schedule). We draw the client's attention to the fact that the draft reference levels and corresponding action plans should be prepared within 18 months of |

| | certification. |
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| Conclusion | Progress is on target (or slightly behind). None of the points in timescale are overdue |
| | Six Performance Indicators (PI) related to this Condition. As this Condition is not yet met, these are not re-scored. |

| Item | Comments |
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| 2 | Condition of Certification 2: Sex ratio and size at age |
| Activity assessed | Age structure of pikeperch is suitably well established but there is no monitoring of sex structure in catches nor of size at age. To determine any shifts in population structure that could affect reproductive capacity, sex composition and size (both weight and length) at age should be established in catches. Size at age is also a good indicator of changes in feeding conditions (ecosystem conditions). Timescale : Data collection should be initiated during the first fishing season post certification and thereafter an ongoing monitoring programme put in place. It may be most appropriate to monitor sex ratios in the gill-net fishery and size at age in the fish-trap fishery. Relevant Scoring Indicators : 1.3.1.1, 1.3.1.2, 2.1.4.5 |
| NBF Action Plan | The sex ratio will be easily monitored by the fishermen in the gill-net fishery during wintertime. Some fishermen clean the pikeperch and make fillets. At that time of the year shortly before spawning it is also very easy to distinguish between males and females. Otoliths for ageing have been sampled and analysed earlier, but not on a regular basis. Normally, size at a certain age will not change very rapidly. Variations in climate (temperature) will, however, affect growth rate, so it may be of interest to measure the length of pikeperch and take samples on a regular and annual basis. It will probably be better to take samples for length, weight and age from pikeperch caught in gill-nets as this fishery catches individuals in the autumn-winter that have finished their annual growth. In addition, samples will be taken from fish caught in gill-nets in the test fishing that will start in August 2006 (see Condition 3 below). These samples will also include young individuals. A large scale tagging experiment performed in 1990 gave no indications of an existence of sub-populations in the lake. Recaptured individuals showed regular seasonal migrations and individuals from different parts of the lake aggregated in the deepest areas during wintertime. |
| Observations | Otoliths have been collected from the August 2006, gillnet test-fishing programme. The NBF collected fish data (sex, size, maturity status and otoliths) from pikeperch that were filleted at the plant of Gøsen Fisk in April. |
| Conclusion | The requirements of Condition 2 have largely been met on target, but the condition is to remain open until it is clear that an ongoing monitoring programme is in place. It is expected that this Condition will be closed following the next surveillance audit and the Performance Indicators re-scored at that time. |

| Item | Comments |
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| 3 | Condition of Certification 3: Ecosystem objectives |
| Activity assessed | As for the pikeperch stock, there is an ongoing analysis of commercial species stock status relative to historical data which would allow management actions to be taken as appropriate to modify fishing pressure. However, management objectives are not explicitly stated. It is not obvious that ecosystem shifts would arise from current fishing activity. However, as a number of species are taken in the fishery, and pikeperch (the main target species) is a top predator in the system, this is possible. Monitoring of target and by-catch species in catches, and scientific monitoring of key prey species such as smelt and roach, should therefore be undertaken. A plan of possible scenarios and corresponding responses should then be developed. |
| | This work should integrate with any other wider ecosystem monitoring (e.g. water quality, plankton) undertaken in the lake, as appropriate. |
| | Timescale: Data collection of catches should be initiated during the first fishing season post certification and thereafter an ongoing monitoring programme put in place. A plan for additional scientific monitoring should be in place within 18 months of certification and implemented within 1 year afterwards (i.e. within 30 months of certification). Development of scenarios and corresponding actions should be in place within the term of the current certification (i.e. within 5 years of certification) by which time an appropriate dataset should be available. |
| | Relevant scoring indicators: 2.1.4.5, 3.A.3.1 and 3.A.3.2 |
| NBF Action | A test fishing program according to the European standard with multi mesh gill-nets will start in August 2006 in a part of Lake Hjälmaren (Mellanfjärden), which probably is the most important nursery area for pikeperch in the lake. This test fishing will also yield good data concerning the whole fish community and additional data concerning the recruitment of pikeperch. The gill-net catch will give a measure of the recruitment of pikeperch at least one year before the same year class will be caught in the fish-traps (see Condition 1 above). Otoliths for ageing will be sampled from the pikeperch. During August two persons will accompany four fishermen distributed over the lake and record all species of fish caught, count all specimens and measure the length of all fish caught in the fish-traps. As these fish-traps have fairly small mesh size, a number of other fish species will be caught. This will, in the long run, give results concerning the status of the populations of most species in the lake. Species not caught in these gears are mainly smelt (<i>Osmerus</i> <i>eperlanus</i>), ruffe (<i>Acerina cernua</i>) and rudd (<i>Scardinius erythrophthalmus</i>). Smelt and ruffe will, however, be caught in the test fishing gill-nets. Rudd occur very close to shore, mostly among reeds, and is unimportant as a prey species. The water management organisation of the lake is monitoring water quality, phytoplankton, zooplankton and benthic invertebrates and it is easy to integrate these data. Water quality data, in particular nitrogen and phosphorus, are important as indicators of lake productivity. |
| Observations | The two test fishing programmes started in August 2006 as planned. A report (in Swedish) has been made based on the visiting of commercial fish-traps. Length-frequency distribution charts are presented for the different species. |
| Conclusion | The requirements of this Condition are being met on-target. Future surveillance audits will review the results of ongoing monitoring and the development of possible scenarios and corresponding responses in response to monitoring results. |

| Item | Comments |
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| 4 | Condition of Certification 4: Recording of any bird by-catch |
| Activity assessed | There is some incidental catch of piscivorous birds in fish traps and possibly also in gill-nets under open water conditions. Numbers of birds caught should be recorded and this data evaluated by relevant organisations in terms of its significance for affected populations. If significant, appropriate mitigation measured should be put in place. Timescale: Data collection of catches should be initiated during the first fishing season post certification and thereafter an ongoing monitoring programme put in place. Presentation of data to the appropriate organisation should take place within 12 months of certification and annually thereafter if necessary. Any mitigation actions should be implemented as soon as practically possible thereafter. |
| | Relevant scoring indicators: 2.2.1.2 |
| NBF Action | As most of the gill-net fishery takes place during ice covered conditions, by-catches of birds are of minor importance in this fishery. Catch of birds in gill-nets will be recorded by fishermen during late autumn and after ice break. Results so far show that birds are caught in fish-traps only rarely. It will be very simple to count birds caught in the trap-nets belonging to the four fishermen mentioned above during August. In this month the number of birds in the lake will probably be at a maximum as all yearlings are ready to fly and no birds have yet left the lake at that time of the year. The dataset will be evaluated by CAB. |
| Observations | Fishermen interviewed claimed that they caught few birds in traps. Monitoring results showed that three birds were caught, in a total of between 600 and 700 haulings of traps (observed by NBF). The caught birds were all cormorants, probably hunting for the trapped fish inside the traps. The cormorant stock in the lake is regarded as too large, and hunting from engine boats is performed each year to cull 1500 birds. |
| Conclusion | Numbers of birds have been recorded, the results confirm expectations that captures are of cormorants and are recognised not to be a threat to local populations of this species. Accordingly, it is not necessary for this data set to be evaluated by CAB. However, as the Condition also requires annual monitoring, it shall remain open to verify further data before rescoring of indicators. |

| Item | Comments |
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| 5 | Condition of Certification 5: External review |
| Activity assessed | An external review programme (independent of the current management authorities, contractors etc) of the management system should be implemented. This should be conducted on a periodic basis appropriate to the fishery. This could be undertaken, for example, by the Swedish Fishery Secretariat (Fiskesekretariatet). |
| | Timescale: A plan for the content and timing of a review programme should be developed within 12 months of certification. The first external review should be undertaken within 2 years of certification. Pelevant Scoring Indicators: 3 A 1 4 |
| | Ketvant Storing Indicators. S.A.1.4 |
| NBF Action Plan | The Swedish Fishery Secretariat has very close relations with the client and may therefore be regarded as less suitable as an external reviewer. Instead we suggest that Dr Peter Karås at the Institute of Coastal Research (SBF) should be appointed external reviewer. Dr Karås has a long experience of coastal fisheries and has worked extensively with freshwater fish species, including pikeperch. Another possibility is to look for a reviewer at a County Board outside Lake Hjälmaren. |
| Observations | Appropriate external reviewers have been identified, but a plan for the content and timing of the review programme has not yet been formed. We would note that the review should include plans and procedures developed by the fishery managers to meet Conditions 1-3. |
| Conclusion | Progress against this Condition is behind target, but it is understood that further work is underway. Achieving a review within 2 years of certification therefore remains achievable, which would meet the requirements of the Condition |

| Item | Comments |
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| 6 | Recommendations |
| | In addition to the above Conditions, two recommendations were made. Action of these is optional, but they are suggested as means of improving management of the fishery. |
| | The first recommendation was to aid in understanding of predator/prey relations within lake Hjälmaren. It was recommended that gut content analysis of pikeperch and other key species at different life stages should be considered. Particularly important would be young life stages of pikeperch to understand possible limiting factors for year class strength. This would also assist with the development of Condition 3. However, it was regarded by the client that the effort needed to produce sound results on this simply would be too high. Trophic relations will vary with season, size and area within each species, and gut content analysis is costly and time-consuming. |
| | The second recommendation was for a formal statistical analysis of past data on recruitment year class strength and subsequent catches (including CPUE) in the fishery, to strengthen future predictions based on this information. No such analysis has been conducted so far, but NBF have plans to try to meet this recommendation. |

| 7 | Any complaints against the certified operation; recorded, reviewed and actioned |
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| | There were no reported incidents of any complaints against the fishermen or management bodies relating to the scope of MSC certification. |
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| 8 | Any relevant changes to legislation or management regime. |
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| | There have not been any significant changes in personnel or management, other than those |
| | discussed above, which would alter the certification status of this fishery. |

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| 9 | Overall Conclusions |
| | Fishery managers have taken appropriate measures to address the conditions of certification raised during the MSC certification assessment. This can be summarised as follows: |
| | 1. Conditions where requirements are deemed to have been met on target but which be reviewed at the next surveillance audit prior to closure. |
| | • Condition 2, 4 |
| | 2. Conditions which are considered to be on-target and which will be subject to full review in future surveillance audits |
| | • Conditions 1, 3 |
| | 3. Conditions where work is currently falling behind target and which will be subject to full review at the next surveillance audit Conditions 5 |
| | Outstanding or ongoing action is required prior to closure of conditions and re-scoring of relevant Performance Indicators. |
| | MSC Certification should therefore continue, subject to satisfactory compliance with outstanding conditions, and surveillance audits continue to the same schedule. |

Information Sources:

Meetings

- 1. NBF (Per Nyberg) 31 July and 1 August 2007.
- 2. Local fishermen 1 August 2007.

Reports etc

1. Nyberg, P. 2006. Bottengarnsregistrering i Hjälmaren augusti 2006 (Registrations from gill-net fishery in lake Hjälmaren August 2006). Working report (in swedish).

Standards and Guidelines used:

- 1. MSC Principles and Criteria for Sustainable Fishing
- 2. MSC Fishery Certification Methodology Version 6. September 2006
- 3. TAB Directives all