Ministry of the Environment Erimo Area Kuril Harbor Seal Management Project Implementation Plan, FY 2016

The Ministry of the Environment will establish an "Erimo Area Kuril Harbor Seal Management Project Implementation Plan," (hereafter, "Implementation Plan") every fiscal year in order to appropriately implement the project, in accordance with the "Erimo Area Kuril Harbor Seal Specified Rare Wildlife Management Plan," (hereafter, the "Management Plan") which was established on 18. March 2016.

The goal of the Management Plan is to establish procedures for population management, damage prevention measures, monitoring, etc., in order to work toward present and future coexistence in the Erimo area between Kuril harbor seals and the local community, including the coastal fishing industry; the Ministry of the Environment will establish these procedures through partnership with various organizations, including the Hokkaido Government, Erimo Town, fishing industry associations, members of the fishing industry, local residents, related organizations, and universities and research institutions. Working toward the accomplishment of these goals, the following projects, etc., will be implemented during FY 2016.

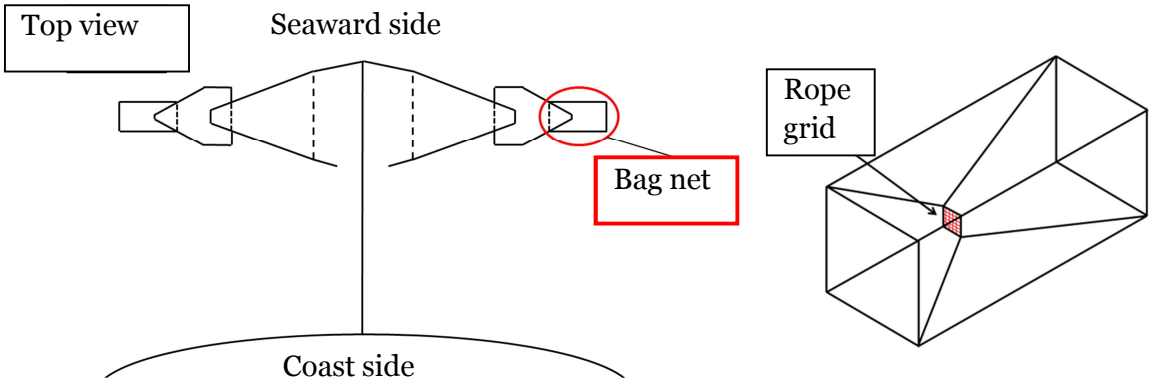
1. Damage prevention measures

The following initiatives, based on results from various inspections and prevention measures which have been implemented in the past, will be implemented to establish new and improved methods for mitigating damage to the fishing industry. Furthermore, these methods will be implemented in collaboration with researchers and other related parties, and with adequate consideration of opinions from local fishermen.

(1) Improvement of fishing nets

Methods proven to mitigate damage by blocking entrance into trap nets (such as the installation of rope grids) will be used to further improve nets that prevent damage. Regarding improvements to nets, the following experiments will be conducted with their goal being the establishment of procedures to mitigate the particularly severe damage done to trap nets.

- During the trap net fishing seasons in spring and autumn, experiments will be conducted on damage preventing trap nets (see figures and photographs below) through the installation of rope grids in trap nets, where damage is particularly severe in the Cape Erimo area.
- Rope grids of two opening sizes (20 cm x 20cm, 25 cm x 25 cm) are to be tested. Further, when they are installed, fasteners such as zippers will be used so that they may be effectively attached and removed according to the status of damage and fishing operations.
- In addition to installing rope grids at the tunnel entrance to the bag net, rope grids will be installed at the entrance to the heart, among other places, to prevent entrance by Kuril harbor seals into the trap nets.



Installation of rope grids (2015)

Attachment and removal of rope grids by zipper (2015)

Through reports and conference meetings, in addition to showing the community the results of experimentation, advice and suggestions will be gathered for more effective damage prevention efforts and these will be reflected in the Implementation Plan the following year.

(2) Improvement of acoustic repellent equipment

Tests will be carried out on how often sound waves should be emitted and over what area, as well as the configuration of the equipment, etc., designed to assist in the development of improved devices which more effectively emit the sound waves that were shown to be effective in repelling Kuril harbor seals in experiments conducted during the previous fiscal year. The following experiments etc. will be conducted, with their goal being the development of improved repellent equipment as a means of mitigating damage which can be sustained long-term and which will have an increased effect in combination with improvements made to fishing nets.

- Examinations of behavior etc. of Kuril harbor seals will be carried out using floating cages, and considerations will be made of how often sound waves should be emitted by repellent equipment, and over what area, etc., along with effective installation methods, and so on.

- Experiments in the vicinity of the trap nets will also be considered once equipment has been developed with configuration, weight, battery life, etc., appropriate for installation in vicinity of the trap nets.


A floating cage installed in a fishing port (2015)


A Kuril harbor seal in a floating cage (2015)

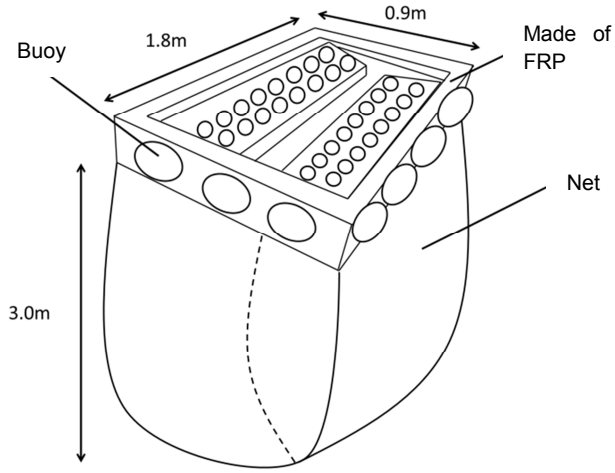
Furthermore, because damage is being caused not only to the salmon trap net fishing industry (the damage that is being caused to the octopus fishing industry is particularly severe), an interview-based survey aimed at future damage mitigation will be conducted in cooperation with researchers and others, regarding the status of damage and fishing operations (fisheries and seasons with the most damage, the amount of damage to catches, the cost of the damage, etc.).

2. Population management

The following initiatives will be implemented in order to perform population management aimed at both mitigating the damage done to the fishing industry and maintaining a sustainable Kuril harbor seal population level.

Because damage prevention alone is not enough to avoid increases in the scope of the damage, capture of Kuril harbor seals will be carried out with the aim of mitigating the damage done to the fishing industry (preventing increases in the scope of the damage, reducing the severe damage done to trap nets, etc.), while also preserving the sustainability of the seal population. Furthermore, because it has been made clear in the research performed to date that it is not so much the easily bycaught juvenile seals, but particular subadults and adults that cause damage in salmon trap nets, the following methods will be employed, aimed at establishing techniques to selectively capture subadult and adult individuals that persistently attack trap nets, and to avoid juvenile bycatch.

- Seals will be captured in a one-month period during each of the fishing seasons in spring and autumn, with the cooperation of members of the fishing industry who operate trap nets with particularly severe damage and trap nets in the area, using methods (trap nets, traps designed to capture seals (figure and photograph below), etc.) that selectively capture individuals that come into or near to trap nets.



Structure of a trap used for capturing seals

A captured Kuril harbor seal (2015)

Regarding capture, the maximum number of individuals to be captured will be determined based on the following considerations.

Current habitat situation

- In recent years, the largest number of individual Kuril harbor seals hauling out in the Erimo area has been on a growing trend, rising from 400 individuals to around 600 individuals (see chart below). The estimated population size, taken from the largest number of individuals hauling out corrected using the haul-out frequency and discovery rate, is approximately 1 000 individuals. Further, the average population growth rate over the past 30 years has been 5% (Matsuda et al. 2015).

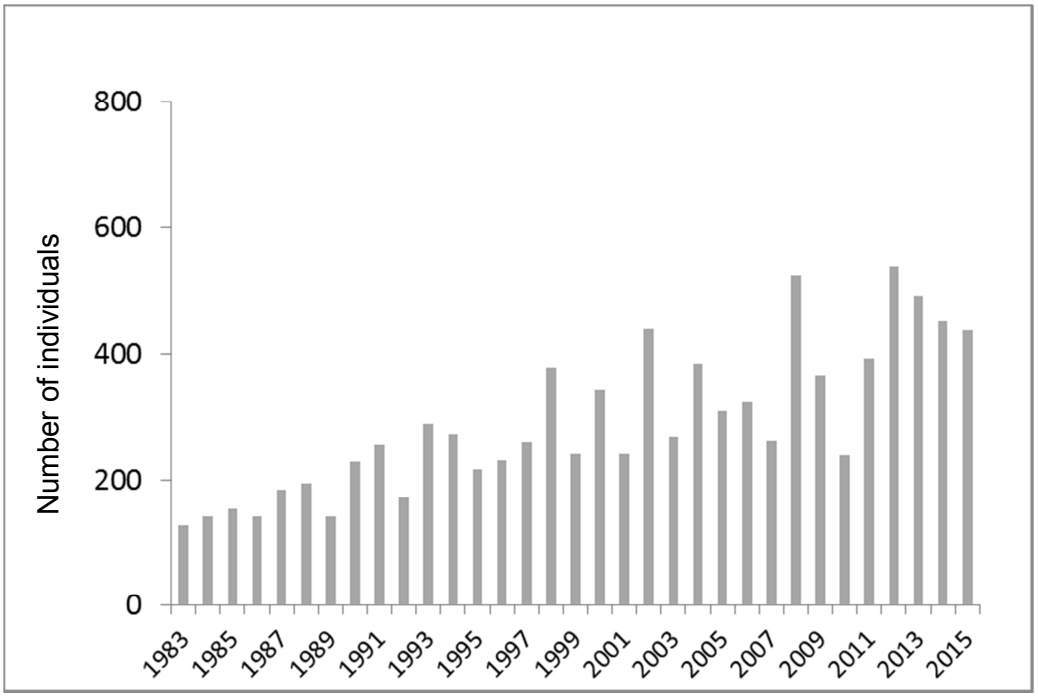


Figure. The largest number of individuals hauling out in the Cape Erimo area
*1983-2010: results of one-week surveys in molting season (Kobayashi et al., 2013)
2011-2015: results of long term surveys from July to November (Kobayashi, unpublished)

Considerations essential for determining the maximum number of individuals to be captured

- Examinations will be conducted over the course of three years from 2016 to 2018, and the maximum number of individuals to be captured will be determmined.
- The following will be considered when determining the maximum number of individuals to be captured: mitigating damage to the fishing industry, while also guaranteeing population sustainability such that the Kuril harbor seal does not once again become threatened, and keeping the probability of extinction within the next 100 years to under 10%, all with continuing management beyond FY 2019 as a necessary condition.
- In light of the reality that the Kuril harbor seal was only recently reassessed from the status of Threatened to Near Threatened, that the Erimo population is highly occlusive, and that there are a number of uncertain elements in the estimates of population size, population structure, and ecology, it is necessary to sufficiently account for the safe sustainability of the population.
- The maximum number of individuals to be captured must be adjusted freely to fit the number of bycaught individuals and imbalances in sex and age among captured individuals (for example, in cases when a high number of adult females, who strongly influence population trends, have been captured, or in cases when the number of juvenile bycatch deaths has decreased).

Determining the maximum number of individuals to be captured

- In the current resource management simulation, which takes the number of bycaught individuals, outbreaks of infectious disease, etc., into account, the probability of extinction within the next 100 years is nearly 0% if the population in 2018 is managed at a level that is 80% of the current population, and if this level is maintained from 2019 onward.
- Therefore, the Ministry of the Environment will determine the maximum number of individuals to be caught such that the population in 2018 will come down to about 80% of the current population size, and by estimating population dynamics taking the population growth rate, etc., into account, approximately 100 seals (excluding the number of bycaught individuals) are to be captured in 2016.
- At the same time, because there have been very few successful captures made to date, there is no data showing the effectiveness of damage reduction through seal capture. The Ministry of the Environment aims to use this as an opportunity to work toward establishing seal capture techniques, as well as to gather the information necessary to establish monitoring procedures in order to gain a grasp of the effects of capture on the Kuril harbor seal population and of the effectiveness of damage reduction through seal capture.

Adjustments and changes to the maximum number of individuals to be captured, etc., and procedures for determining the number in future years

- The number of individuals to be captured from next year onward will be determined flexibly in a manner that takes into account the actual capture results and monitoring

results from 2016.
The maximum number of individuals to be captured each year will be reexamined after hearing the opinion of the Science Committee.

- In the event that the number of individuals captured in a single year is too low or too high, adjustments will be made in the number of individuals to be captured in the following year.
- From the point of view of adaptive management, the information necessary for reexamining the plan will be gathered, a sustainability assessment performed, and each year from next year onward, a new Implementation Plan will be established and the maximum number of individuals to be captured will be determined.
- During the three-year Management Plan period, a formula for doing management that fits the population's situation will be developed, including a system for incorporating feedback from new data.

The following other considerations will be made regarding population management.

- In the event that an unforeseen circumstance, such as an epidemic outbreak, is discovered in the population, the above may not necessarily apply.
- To the fullest extent possible, the Ministry of the Environment will effectively put captured individuals to practical use, including use for research in order to gather data which will facilitate appropriate population management, and strategically raising individuals and transferring them to zoos and aquariums for educational and other purposes.
- Moreover, in cases when captured individuals are to be euthanized, a method will be employed which limits their suffering to the greatest extent possible.
- Depending on the seal capture situation, other procedures (including the use of firearms) will also be considered as necessity dictates.

3. Monitoring

Surveys covering the following items will be conducted in order to appropriately manage the Kuril harbor seals, verify project implementation effectiveness, and provide feedback about the population's situation to the Management Plan. Moreover, as a part of adaptive management, survey items may be added as necessity dictates.

(1) Population size and structure

- Accurate haul-out numbers will be surveyed by performing counts of the number of individuals hauling out using visual observation from on land and unmanned aerial vehicle (UAV) photographs.
- The omission rate will be calculated from the counts obtained by UAV and visual observation, and attempts will be made to improve the accuracy of these measurements.
- UAV photography will be conducted primarily during molting season, when the number of individuals hauling out is higher, however photography will also be considered during breeding season as necessity dictates.
- UAV photographs will be analyzed (measurements of body length, girth, etc.) and all efforts will be made to ascertain the structure of the population.

(2) Survey of bycaught individuals

- While gathering information about bycatches in trap nets, as many seals as possible will be retrieved, and data will be collected to facilitate survey items (4), (5), and others, which are necessary to ascertain the condition of the population.

(3) Survey of captured individuals

Using captured individuals, data will be acquired to facilitate survey items (4), (5), and others, which are necessary to ascertain the condition of the population.

(4) Survey of damage done to the fishing industry and of the effectiveness of damage prevention measures

- Information will be gathered through means such as questionnaires on the damage situation and shipboard surveys, and the degree and extent of the damage will be ascertained.
- Multiple indices will be used in the assessment of the damage situation, including the damage-to-catch ratio, total catch size, total catch value, and others.
- Surveys will be conducted on the stomach contents of bycaught and captured individuals, and of the general situation of salmon predation by seals.
- The effectiveness of damage preventing nets will be verified through surveys of seal behavior and the situation of salmon entering the nets, using underwater cameras installed at trap nets, and through gathering information about the installation times and duration of installation of rope grids in trap nets.
- Surveys will be conducted on the damage situation in the local fishing industry other than damage done to salmon trap nets, using means such as interviews.

(5) Population trends

- Ecological data which is necessary in order to ascertain population trends (body length, body weight, age, sex, blubber thickness, breeding conditions, etc.) will be obtained from bycaught and captured individuals.
- Surveys will be performed on the animals' range, etc., using EM transmitter tags.
- The Ministry of the Environment will continue to collect specimens necessary for analysis of items such as infectious disease and the population's genetic diversity.

(6) Habitat

- The Ministry of the Environment will gain the cooperation of members of the fishing industry, and consider how to build a system for collecting and analyzing information, which is necessary in order to gain a complete understanding of the coastal ecosystem.

(7) Assessment of sustainability

- Population conditions will be assessed based on quantitative analysis of the results of monitoring.

Literature cited

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・ Kobayashi Y, Kariya T, Chishima J, Fujii K, Wada K, Baba S, Itoo T, Nakaoka T, Kawashima M, Saito S, Aoki N, Hayama S, Osa Y, Osada H, Niizuma A, Suzuki M, Uekane Y, Hayashi K, Kobayashi M, Ohtaishi N, Sakurai Y (2014) Population trends of the Kuril harbour seal Phoca vitulina stejnegeri from 1974 to 2010 in southeastern Hokkaido, Japan. Endangered Species Research24(1): 61-72.