Salmonid Enhancement Program Aquaculture Licence

Licensed for: Aquaculture                  Date Issued: 1 July 2015

LICENCE No. SEP - «DFO_Lic_No» - 2015                  Expiry Date: 30 June 2017

ISSUED to:
Department of Fisheries and Oceans

c/o «SITE_NAME»

«ADDRESS»

«CITY_PROV», «POSTAL_CODE»

Phone «Phone»

Fax «Fax»

This licence is issued under the authority of the Fisheries Act and confers, subject to provisions of the Fisheries Act and Regulations made there under, the authority to carry out aquaculture activities including cultivation and harvest of fish and prescribed activities under the conditions included herein and/or attached hereto.

The above licence holder is authorized by this licence to carry on aquaculture at the following location:

<table>
<thead>
<tr>
<th>Facility Reference Number</th>
<th>Location and Legal Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>«SITE_REF_NUMBER»</td>
<td>Facility: «SITE_NAME»</td>
</tr>
<tr>
<td></td>
<td>Legal Description: «Legal»</td>
</tr>
</tbody>
</table>

Species and Total Maximum Production at the Enhancement Facility: As listed in the annual Department of Fisheries and Oceans Salmonid Enhancement Regional Production Plan

Required Record Keeping and Reporting: Details are contained within the attached conditions of this licence.

Compliance Advisory: Contravening a condition of this licence is an offence under the Fisheries Act.

It is the responsibility of individual licence holder to be informed of, and comply with, the Fisheries Act and the regulations made there under as well comply with all laws, bylaws and orders of any competent government authorities which affect the enhancement facility described herein, in addition to these conditions.
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«Attachments»
**Part A. Definitions**

“Containment Structures” are structures used to contain finfish for the purposes of aquaculture.

“Department” means the Department of Fisheries and Oceans.

“Enhancement Facility” means an aquaculture facility operated by DFO, or under the direction of DFO, culturing Pacific salmon for the purpose of increasing their freshwater survival before their intentional release into fish habitat.

“Facility operator” means the person who oversees the operation of the facility and who is authorized by the Department to act for the Department respecting the operation of the facility.

“Fish” as per the *Fisheries Act* includes parts of fish, shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals, and the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals.

“Fish Habitat” as per the *Fisheries Act* means spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes.

“Fish Health Management Plan (FHMP)” means a document containing all of the facility specific standard operating procedures (SOPs) that are used to manage fish health.

“Fish Health Veterinarian” (FHV) means a veterinarian licensed in the Province of BC, on staff with the Department for the care of fish in aquaculture facilities.

“Major Mortality Event” means a significant number of fish mortalities caused by disease, life support failure, or through intentional destruction.

“Management Plan” means a facility-specific description of the infrastructure and mode of operation for each cultivated species and location specified on the face of the licence.

“Regional Production Plan” means Salmonid Enhancement Program facility production targets that have been developed through the Salmonid Enhancement Program integrated production planning process and approved by the Regional Director of the Ecosystem Management Branch.

“Stock” means a group of fish from one production cycle that are defined by the system of origin, species and run timing.
Part B. Licence conditions specific to the licence

«Provisos»
«SeapenName»
«SeapenCoods»

Part C. General Conditions of Licence

1. Application and Licensed Species

   1.1 These conditions apply to the cultivation of fish in an enhancement facility owned and operated by the Department.

   1.2 This licence authorizes the enhancement facility to cultivate and release species of fish and quantities as set out in the Regional Production Plan.

2. Production

   2.1 The maximum production of cultivated fish from this enhancement facility shall be consistent with the Regional Production Plan.

3. Management Plan

   3.1 No change to the physical structure or mode of operation of the enhancement facility that deviate from the facility-specific Management Plan (Attachment I) shall be made without prior approval of the Department.

4. Transfer of Fish

   4.1 Only fish of the species, stocks and production targets listed on the Regional Production Plan may be introduced to the enhancement facility.

   4.2 Where fish are transferred between enhancement Facilities, the following conditions shall be met prior to transfer from the source enhancement facility:

      (a) mortalities in any stock reared at the source enhancement facility have not exceeded 1% per day due to infectious diseases, for any four consecutive day period during the rearing period;

      (b) no stock at the source enhancement facility has a clinical disease requiring treatment;
(c) no stock at the source enhancement facility is known to have had any significant
diseases (Appendix I - List of Significant Diseases), or other infectious agents of
concern to the Department; and

(d) where conditions 4.2 (a), (b) and (c) cannot be met, written approval from the Fish
Health Veterinarian (FHV) is required following a risk assessment of site records,
review of diagnostic reports, evaluation of stock compartmentalization, and related
biosecurity measures, prior to fish being transferred.

4.3 Biosecurity measures for the transfer of fish shall be consistent with the Fish Health
Management Plan (FHMP).

4.4 Records of transfers and releases into and from the enhancement facility shall be
provided annually to the Minister, as set out in condition 13.1.

4.5 A copy of this licence must accompany all shipments of fish between enhancement
Facilities.

4.6 Only transfers within a Salmonid Transfer Zone (Appendix II) are permitted under this
licence.

4.7 Where fish are moved between Salmonid Transfer Zones (Appendix II), a separate
licence is required under Sections 54-57 of the Fishery (General) Regulations.

5. Fish Health

5.1 The enhancement facility shall have in place and shall follow a Fish Health
Management Plan (FHMP).

5.2 The FHMP shall contain all the Health Concepts and Required Elements for
Enhancement Facilities set out in the Salmonid Health Management Plan (Appendix
III).

5.3 No fish shall be introduced to the enhancement facility except as in accordance with the
targets indicated in the Regional Production Plan.

5.4 The facility operator shall ensure that the fish cultivated in the enhancement facility are
given care and attention consistent with their biological requirements.

5.5 The facility operator shall notify the Departmental FHV if there is a fish health
problem:

(a) there shall be immediate notification if unexplained mortalities in any stock reared at
the enhancement facility have exceeded 1% per day for a four consecutive day
period; and

(b) on suspicion of infectious disease, surveillance shall be increased, the FHV consulted
and samples must be submitted to a FHV-approved diagnostic laboratory for
diagnosis, if required.
5.6 The facility operator shall keep complete and accurate records of fish health and inventory in the enhancement facility, including diagnostic test results, therapeutant use and vaccination records. (Appendices IV & V)

5.7 The facility operator shall make all fish health records available to the FHV or representative of the Department upon request.

6. **Major Mortality Event**

6.1 Fish health emergencies shall be addressed as part of the Fish Health Management Plan.

6.2 Where fish are destroyed, the procedures shall follow the FHMP unless otherwise directed by the FHV.

6.3 The facility operator shall report major mortality events to the FHV within 24 hours to discuss event management, mitigation and disposal of the mortalities. (Appendix IV)

6.4 The disposal of mortalities as well as the cleaning and disinfection of the containers in which the fish were held and the mortality collection equipment shall follow the FHMP bio-security protocols.

7. **Escape Prevention**

7.1 The facility operator shall take all reasonable precautions to prevent the escape of cultivated fish:

(a) while transporting fish on, over or through fresh or tidal waters;

(b) while transporting fish to or from the enhancement facility; and

(c) while transferring fish between containment structures within the enhancement facility.

7.2 The facility operator shall ensure that no person deliberately releases cultivated fish from the enhancement facility except as permitted under this licence.

8. **Release of Fish**

8.1 Fish shall only be released in accordance with the Regional Production Plan.

8.2 Fish shall only be released if:

(a) there is no suspicion of infectious disease; and

(b) in the last 3 months there was less than 5% cumulative mortality, after hatching, in that stock.
8.3 If either of the conditions set out in condition 8.2 cannot be met, written approval by the FHV is required prior to release.

8.4 The release of fish which have had a disease outbreak requiring antibiotic therapy shall be based on a risk assessment of site records, diagnostic reports, evaluation of stock compartmentalization and related biosecurity measures.

8.5 A copy of this licence shall accompany the fish to the site of release.

8.6 Records of all releases shall be kept and reported as set out in condition 13.1.

9. **Adult Carcass Disposal**

9.1 Where fish carcasses are placed in streams for stream nutrification, the placement must follow the Departmental Guidelines (Appendix VII – In-Stream Placement of Salmon Carcasses for Nutrient Enrichment).

9.2 A carcass placement plan shall be prepared and shall be approved by DFO prior to placing carcasses in or near fish habitat.

9.3 The written approval shall accompany all carcasses being transported for placement.

9.4 Fish that have been spawned or are in excess to spawning, not used in clause 9(1), shall be disposed of in a manner that does not impact the health of fish in fish habitat.

10. **Predator Control**

10.1 The enhancement facility shall have in place and shall follow an up-to-date Predator Control Plan.

11. **Net Pen Rearing**

11.1 If net pens are used for marine or freshwater temporary rearing, the facility operator shall follow the conditions set out in Appendix VIII - Licence Conditions for Net Pens operated by Enhancement Facilities.

12. **Records**

12.1 An up-to-date copy of all records listed below relating to the enhancement facility shall be kept at the enhancement facility for a period of 6 years and shall be produced upon request to a Fishery Officer or other representative of the Department.

12.2 Records shall be kept in accessible and legible format, protected from damage. They may be kept either electronically or in a paper version.

12.3 Using Appendix V - Brood Summary Information as a guideline, the facility operator shall maintain records of:
(a) the fish entering or introduced to the enhancement facility as well as all releases and transfers from the enhancement facility by

(i) species;

(ii) age/developmental stage;

(iii) quantity; and

(iv) date of transfer to or from the source facility or water body.

12.4 Using Appendix IV - Fish Health Information as a guideline, the facility operator shall maintain records of:

(i) the number on site, by species and age/developmental stage;

(ii) the number, by species and age/developmental stage of fish mortalities;

(iii) the reason for losses, diagnosis (where applicable);

(iv) any treatment applied; and

(v) vaccination.

13. Reporting

13.1 The facility operator must report all transfers to and from the facility, as well as all releases from the facility to the

Salmonid Enhancement Program Planning and Assessment Unit
200-401 Burrard Street
Vancouver, BC, V6C 3S4
Fax: 604-666-0417

(a) All information listed in the Transfer and Release Summary Information as set out in Appendix VII shall be collected and reported. Records may be submitted in hard copy or electronically.

(b) Reports shall be submitted by June 30 of each year for the information on spring releases and transfers.

(c) Reports shall be submitted by October 31 of each year for information on summer and fall releases.
Appendix I - List of Significant Diseases

The diseases and infectious pathogens listed below are considered either exotic to British Columbia (BC) or, such as IHN that is known to exist in BC, have the potential to emerge from the Pacific marine ecosystem. These diseases can severely impact fisheries and affect regional and national trade so they warrant urgent notification and immediate attention.

<table>
<thead>
<tr>
<th>Disease</th>
<th>(causative agent:)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infectious Hematopoietic Necrosis (IHN)</strong></td>
<td>Infectious hematopoietic necrosis virus (rhabdovirus)</td>
</tr>
<tr>
<td><strong>Infectious Pancreatic Necrosis (IPN)</strong></td>
<td>Infectious pancreatic necrosis virus (birnavirus)</td>
</tr>
<tr>
<td><strong>Viral Hemorrhagic Septicemia (VHS) – European Strain</strong></td>
<td>Viral hemorrhagic septicemia virus (rhabdovirus)</td>
</tr>
<tr>
<td><strong>Infectious Salmon Anemia (ISA)</strong></td>
<td>Infectious salmon anemia virus (orthomyxovirus)</td>
</tr>
<tr>
<td><strong>Oncorhynchus masou Virus Disease (OMV)</strong></td>
<td>Oncorhynchus masou virus (herpes virus)</td>
</tr>
<tr>
<td>Any filterable agent causing cytopathic effects in tissue culture other than the above.</td>
<td></td>
</tr>
<tr>
<td>Whirling disease</td>
<td>Myxobolus cerebralis</td>
</tr>
<tr>
<td>Cold Water Vibriosis (Hitra disease)</td>
<td>Vibrio salmonicida</td>
</tr>
</tbody>
</table>
Appendix II - Map of Salmonid Transfer Zones

Figure 1
Salmonid Transfer Zones for British Columbia

1. Trans Boundary
2. Liard
3. Peace
4. Skeena
5. Central Coast
6. Queen Charlotte Islands
7. Southern Coast
8. Fraser
9. Columbia
Appendix III - Salmonid Health Management Plan (HMP) for «SITE_NAME»

1. Objectives, Personnel, & Executive Summary

The Health Management Plan (HMP), submitted to Fisheries and Oceans Canada as part of the Enhancement Facilities (hatcheries) Aquaculture Licences, serves three purposes: i) to outline good health conditions for cultured salmonids and may apply to both freshwater and short-term marine rearing; ii) to reflect a commitment to comply with the principles, concepts, and required elements of fish health management when culturing salmonids or gametes thereof, and; iii) to be used by facility staff for training and for day-to-day interaction with the fish, and by other fish health staff who are responsible for maintaining and monitoring good health status of the fish, and by the Licence Holder’s Health Management Team who makes decisions related to fish health.

This document forms one of two components of «SITE_NAME»’s overall Health Management Plan (HMP): i) Concepts; and ii) FHMP Standard Operating Procedures (SOPs). This HMP concept document forms Appendix III of the current Enhancement Facilities Aquaculture Licence under the Pacific Aquaculture Regulations (PAR, 2010). As an appendix of the Enhancement Facilities Aquaculture Licence, this document is the publicly available component and commits «SITE_NAME» to ensure and maintain the health of its cultured fish. It also commits «SITE_NAME» to abide by four key principles of the management of health:

1. Characterizing the health status of the animal population
2. Identifying and managing risks
3. Reducing exposure to disease-causing agents
4. Judicious application of chemicals and drugs

A number of health concepts herein may refer to an SOP that coincides with other health concepts (e.g. both biosecurity and fish handling may refer to the same SOP, common to both concepts).

The SOPs cited in this salmonid HMP concept document are initially submitted in their entirety to Fisheries and Oceans Canada’s Aquaculture Management Division (DFO-AMD) for review and response. Thereafter, only amendments to the FHMP-SOPs will be submitted annually for Departmental review and response.

1.1 Fish Health Management Team: Personnel duties and responsibilities

The Fish Health Management Team is comprised of the entities as defined below. The authority to alter the SOPs contained within this document, and the associated Fish Health Management Plan, lies with the Fish Health Management Team and should occur in a consultative process. The responsibility for carrying out the procedures defined within this document, correctly and according to the individual protocol, lies with staff trained in the individual procedures.

1.1.1 Veterinarian

A licensed Veterinarian, in conjunction with facility and biological support staff, oversees fish health management for SEP facilities. The Veterinarian, supported by the Pacific Biological Station Fish Pathology Laboratory, is expected to exercise good professional judgment in fish health matters. The Veterinarian is licensed in BC and fosters a lawful Veterinarian-client-patient relationship with the Licence Holder. The Veterinarian is responsible for disease diagnoses, interpretations, and writing prescriptions, and is expected to exercise good medical judgment in matters of fish health. Specific duties include site visits, diagnostic workups for fish, treatment advice, and disease prevention and control recommendations. Where applicable, the Veterinarian will report disease findings to relevant authorities (See list of reportable diseases in Appendix I). Veterinary contact information is posted and available to on-site fish health staff.

1.1.2 Hatchery management
The hatchery managers are responsible for identifying and managing disease-related risk factors to minimize their impacts on fish health. The hatchery managers consult with the Veterinarian and DFO biologists on management of fish health issues, and are responsible for reporting outbreaks of significant diseases to other sites in the geographic vicinity and to the proper authorities.

1.1.3 Hatchery staff

On-site staff are responsible for day-to-day fish health management, according to this Plan and the hatchery manager's directions. As per conditions of licence, all facility staff have read and abide by this HMP concept and relevant operational SOPs, signed-off, and practice appropriate hygienic procedures supportive of fish health. General facility staff may be assigned specific fish health duties from time to time.

1.1.4 Support Biologists

Fisheries and Oceans biological support staff are available for consultation and to serve as a liaison between facility staff and the Enhancement Support and Assessment Unit.

1.1.5 Contact names and numbers

Contact names and numbers for all key fish health personnel, including emergency numbers, are posted in an easily identifiable location at each site.

2. Health Concepts and Required Elements

This section outlines the general principles of fish health management:

- Keeping the fish healthy and maintaining an optimal environment
- Keeping pathogens out
- Keeping disease from spreading
- Maintaining good records of appropriate information
- Minimizing impacts on natural populations
- Minimizing impacts on the receiving environment

The supporting operating procedures referenced in this Health Management Plan may be found in «SITE_NAME»’s FHMP Standard Operating Procedures.

Note: The focus of SEP’s work is the production of juvenile Pacific salmon for stock enhancement and conservation purposes. Netpen holding is limited to a handful of facilities, which have the infrastructure and historical evidence of improved survival following a brief period of acclimation to a semi-natural environment. Additionally, this production strategy allows imprinting to a watershed for the eventual return in support of recreational fisheries in the areas whose natural spawning and rearing habitats are compromised. Netpen SOPs can be found in the facility FHMP-SOP document.

2.1 Biosecurity

Disease-causing agents (pathogens) may be spread by sick fish (wild or cultured) through the water, on shared equipment, other animals, or inadvertently by personnel, visitors or their personal gear. Entrance of potential pathogens is minimized by supporting an effective biosecurity “barrier” at each facility. Biosecurity measures apply to all personnel, visitors, suppliers, regulators, vessels, and all equipment. Biosecurity has three main goals: keeping fish healthy, keeping pathogens out, and keeping disease from spreading. See the heading below: “Keeping Pathogens Out” for operational SOPs.

2.2 Keeping Fish Healthy

Keeping fish as healthy as possible is critical to keeping pathogens from coming on site, reducing incidence of disease attributable to those pathogens already present, and/or minimizing spread of pathogens within or between sites.
Fish must be routinely monitored for signs of health and disease and for this reason all staff should be familiar with normal fish appearance and behaviour. Observations that may indicate a problem with the population include (but are not limited to):

- Physical changes – skin darkening, scale loss, fungal or ulcerative external lesions, increased opercular movements (respiration), protruding eyes
- Behavioural changes - loss of normal swimming and schooling behaviour, flashing, failure to elude capture, diminished response to feeding, gasping at the surface, clustering near water inflows or near airstones

Fish should be kept at reasonable densities as determined by species, size, number, type of rearing unit and water quality/availability. Changes in behaviour and physical condition should be reported to site management as early detection is the key to good disease management.

2.2.1 **Suitable rearing environment**

«SITE_NAME» is responsible for ensuring a suitable rearing environment for the fish so they remain healthy at each life stage. Requirements related to materials used in the construction and maintenance of rearing units provide security and minimize risk of potential escape or harm to fish. Facilities are staffed 24-hours daily or are locked, alarmed, secured, or otherwise monitored to control entry and deter vandalism.

2.2.2 **Normal fish behaviour is observed**

Fish are routinely monitored for signs of normal health and disease. All staff are familiar with normal fish appearance and behaviour. Early detection of altered activity is key to maintaining health and disease management so changes in behaviour and physical condition are recorded and reported to facility managers upon discovery. To minimize stress and mortality, fish are held at species and lifestage-specific densities.

Refer to **Juveniles - health observations** SOPs in «SITE_NAME»’s Fish Health Management Plan.

2.2.3 **Predator exclusion**

Predators include birds, rodents and occasionally mammals such as mink, river otters and bears. Reasonable, due diligent attempts are made to exclude predators from the facility and from interacting with the fish. As detailed and required in the conditions of licence «SITE_NAME» follows mitigation procedures striving toward minimal predator interaction with the cultured fish. Every attempt should be made to exclude predators from the site.

Refer to **Predator exclusion** SOPs in «SITE_NAME»’s Fish Health Management.

2.2.4 **Feed and nutrition**

Feeding is both an art and a science. A site-specific, customized feeding program coupled with appropriately sized, high quality feed will fulfill the nutritional requirements needed for the growth and health maintenance of the fish. The amount fed will be influenced by many factors including: water temperature, species, body size, age, type of feed and different feed delivery methods.

Proper storage of feed is essential to maintain its nutritional value. Feed stored under improper conditions will result in rancidity and degradation of essential nutrients. Feed should be stored in secure buildings such that wildlife is excluded and spillage is prevented.

Refer to **Feed, feed storage, & feeding practices** SOPs in «SITE_NAME»’s Fish Health Management Plan.

2.2.5 **Water quality monitoring**
Maintaining good water quality is vital to good fish health. The operator should maintain a regular program for monitoring and recording water quality at hatchery sites. Monitoring will vary between sites depending on location and the specifics of the aquatic environment and the frequency of monitoring will depend on available equipment and type of facility water use (i.e., flow through or recirculation). In-line monitoring may be applicable.

Refer to Water quality monitoring SOPs in «SITE_NAME»’s Fish Health Management Plan.

2.2.6 Water quality contingency planning

The facility should maintain a contingency plan in the event of acute deterioration of water quality (for example due to loss of flow or contamination of supply). Failure of pumps requires an immediate response. Systems should be suitably alarmed to indicate a water supply failure. The site should have backup systems to ensure water supply is not interrupted and quality is maintained.

Refer to Water quality contingency plan SOPs in «SITE_NAME»’s Fish Health Management Plan.

2.3 Fish Handling Techniques

2.3.1 Routine handling techniques (Marking, tagging, length/weight sampling)

«SITE_NAME»’s fish handling procedures - including types of equipment used and equipment maintenance - are designed to minimize stress, injury, escape, and predisposing fish to disease. Observing fish during handling, and for a period after handling, ensures any negative effects are noted and steps are taken to mitigate impact. Staff minimize the time fish are exposed to stressful events such as crowding and out-of-water events (i.e. moving, sampling, tagging, injecting, etc.).

Marking fish is a valuable tool for accurate stock assessment. The species, number of fish to be marked and method of marking should be reviewed annually during this facility’s production planning meetings. Marking should be done in a manner designed to result in minimal injury and stress to the fish. Appropriate anaesthesia and monitoring for adverse effects, both during the procedure and for several days following, are standard, as the stress of the procedure and resulting wound can compromise the immune response of the fish.

Each handling event is recorded.

Refer to Marking Fish; Fish handling procedures; Individual length/weight and bulk weight sampling protocols SOPs in «SITE_NAME»’s Fish Health Management Plan.

2.3.2 Fish transports

Fry, smolts and other life stages should be handled in as stress-free a manner as possible in preparation for transport. Equipment should be checked to prevent significant injury that could predispose fish to damage and/or disease. Proper hygiene and disinfection are adhered to. Appropriate transfer permits are obtained from DFO.

Refer to Transporting fish; Ponding SOPs in «SITE_NAME»’s Fish Health Management Plan.

2.4 Keeping Pathogens Out

Biosecurity refers to an integrated strategy to assess and manage the risks that threaten animal health, human health, food safety, and the environment. The key components of a biosecurity program involve the exclusion of pathogens from a site and the containment of pathogens within a site if a disease situation does occur. The nature of enhancing wild populations using gametes collected from mature salmon returning from the oceans means that it is impossible to prevent the introduction of pathogens in all cases. Nevertheless, measures are in place to minimize the introduction of pathogens at key fish culture junctions and to minimize the impacts related to the presence of pathogens.
2.4.1 Site physical barriers

Management is responsible for providing a suitable, secure rearing environment. Additionally, physical barriers to prevent uncontrolled or undesirable human and animal entry, the risks involved with movement of all personnel (staff, management, volunteers, Fish Health Management Team), visitors and equipment are assessed and managed.

2.4.2 Personnel/visitor/supplier movement

Staff will adhere to biosecurity procedures for the site. Where possible, personnel and visitors do not travel between different facilities. If such travel is unavoidable, personnel should not return to a clean facility after visiting a disease-suspect one, or will adhere to all biosecurity procedures at each facility to minimize the risk of inadvertently spreading disease between sites. Each site shall have posted procedures for all visitors, and visitors are expected to follow these procedures. Visitor access will exclude any areas containing sensitive life stages, i.e. incubation rooms. Suppliers should be advised of operator and site procedures in advance. Suppliers who visit multiple sites shall be subject to strict biosecurity measures and may be requested not to come on site.

Refer to Site and staff disinfection and biosecurity SOPs in «SITE_NAME»’s Fish Health Management Plan.

2.4.3 Equipment/vehicle movement

Where possible, equipment will not be shared between sites. This includes pumps, vehicles and fish handling equipment. Where this is not possible, equipment that must be used at multiple sites should be subject to strict biosecurity and disinfection measures between uses.

2.4.4 Equipment maintenance

To reduce the possible spread of pathogens by fish, personnel or via a waterborne route, equipment should be kept clean at all times. Equipment should be properly disinfected after each use and put away in its proper location.

Refer to Equipment disinfection SOPs in «SITE_NAME»’s Fish Health Management Plan.

2.4.5 Moving fish within and between sites

Fish movement between sites is kept to a minimum. A disease risk assessment should be performed in conjunction with the Fish Health Management Team prior to moving fish and necessary transfer permits should be obtained. Clinically ill fish will not be moved between sites. The move should be planned in advance to be as stress-free and short as possible. Particular care should be paid to the fish during transportation to avoid undue stress or possibility of escape. Water quality should be maintained and frequently monitored during transport.

The receiving sites will make arrangements for isolating the newly arriving fish. Once on site, measures should be used to limit the potential transmission of any previously undetected pathogens to the facility’s original population.

Refer to Ponding; Pre-release or transfer disease risk assessment; Egg and milt transport; Quarantine/isolation procedures for suspected disease outbreaks SOPs in «SITE_NAME»’s Fish Health Management Plan.

2.4.6 Monitoring Fish Health

Fish should be monitored at least once daily for any unusual behaviour, visible lesions or other sign of disease. Changes in behaviour and physical condition should be reported to site management. Additionally, routine scheduled length/weight sampling during rearing allows a more detailed
examination of the fish, as well as comparisons of actual versus expected gains and tracking of biomass per tank for appropriate density management.

Where unexplained mortalities in any stock have exceeded 1% per day for four consecutive days, the veterinarian must be immediately notified.

Refer to **Juveniles-health observations** SOPs in «SITE_NAME»’s Fish Health Management Plan.

### 2.4.6.1 Mortality classification

Mortalities should be examined for external signs of disease, as per the operator procedure, suspect mortalities may be examined internally. Suspected causes of mortality must be recorded and fish health management should be notified of any unusual numbers or types of mortalities.

Refer to **Mortality classification** SOPs in «SITE_NAME»’s Fish Health Management Plan.

### 2.4.6.2 Mortality collection and disposal

Mortalities should be collected on a routine and frequent basis to minimize the potential spread of disease, to minimize attractiveness to predators and to allow rapid identification of a health issue. The mortality storage area should be an appropriate distance away from any rearing units and outside usual travel corridors to minimize inadvertent spread of disease. Proper disinfection procedures should be adhered to after each mortality collection.

Refer to **Mortality collection and disposal** SOPs in «SITE_NAME»’s Fish Health Management Plan.

#### 2.5 Specific Fish Health Procedures

##### 2.5.1 Anaesthetizing and sedating Fish

A number of fish health procedures require that fish be anaesthetized. Acquiring chemical anaesthetics requires a veterinary prescription. Netting of fish prior to anaesthesia should be done in as stress-free a manner as possible. Exposure to anaesthetic should be minimized while ensuring the anaesthetic level is adequate for the procedure. Anaesthetized fish should be carefully monitored at all times and the water quality of the anaesthetic bath – in particular, oxygen level – should be monitored.

Refer to **Anaesthesia** SOPs in «SITE_NAME»’s Fish Health Management Plan.

##### 2.5.2 Vaccinating fish

Vaccines are used to boost immunity to specific infectious diseases (e.g. Vibriosis) and are part of an integrated fish health management program. Vaccines are biological substances that must be stored (refrigerated) and handled as per manufacturer’s instructions so as to maintain their safety and effectiveness. A product insert for each vaccine that is on site is kept in a safe, readily accessible place. Staff should be appropriately trained prior to undertaking the vaccination procedure to ensure that biologicals are used safely (i.e., wearing appropriate personal protective gear and taking suitable precautions).

Vaccination must be done in accordance with manufacturer’s guidelines to ensure proper results. Since stress reduces the response of fish to a given vaccine, fish should be handled in as stress-free a manner as possible.

Refer to **Vaccine storage, handling, and administration; Fish handling procedures** SOPs in «SITE_NAME»’s Fish Health Management Plan.

##### 2.5.3 Euthanasia

16
In the uncommon situation where fish need to be euthanized (e.g., to facilitate specific fish measurements, sampling, mercy-killing, or culling), it is recorded and done in as humane a manner as possible, facilitating rapid and irreversible loss of consciousness.

Refer to *Euthanasia* SOPs in «SITE_NAME»’s Fish Health Management Plan.

### 2.6 Keeping disease from spreading

#### 2.6.1 Separation of fish groups

Owing to the nature of enhancement, which follows the natural life cycles present in the aquatic ecosystem, SEP facilities often contain multi-year-classes. Different species or stocks are kept separated while on site. Rearing units are kept separate to prevent transmission of disease between groups. It is an important biosecurity measure to ensure that personnel movements are considered from a risk management perspective and all traffic flows from the most sensitive life stages to the least to ensure that the most susceptible fish are not exposed to pathogens that may be carried by older, more resistant, fish.

#### 2.6.2 Minimizing disease within the site

All efforts should be made to minimize disease on a site. All personnel will adhere to the facility hygiene and disinfection procedures. Tank cleaning and moribund/mortality collection is carried out on a routine and frequent basis. This serves to reduce the potential exposure to pathogens and minimize predator attraction.

#### 2.6.3 Juvenile treatments

There is a great deal of physiological stress associated with juvenile growth and smoltification. At the same time, the juvenile salmonid immune system is still developing. Because of this, juveniles represent a particularly susceptible life stage and judicious use of antimicrobial agents may help minimize losses due to infectious agents.

Refer to *Juvenile treatments* SOPs in «SITE_NAME»’s Fish Health Management Plan.

### 2.7 Broodstock Management

#### 2.7.1 Suitable holding environment

«SITE_NAME» is responsible to provide a suitable, safe and secure holding environment. Escape and predation prevention is essential.

#### 2.7.2 Biosecurity

Where possible, designated staff and equipment are selected to interact with broodstock. Strict disinfection and hygiene procedures are in place. Where other age classes are present, biosecurity is particularly vital to prevent the transfer of pathogens from the mature fish to susceptible young fry.

To minimize two-way transmission of disease, mature broodstock are held in a designated portion of the facility, removed from production or hatchery fish. Broodstock may use a separate water supply.

Refer to *Broodstock biosecurity* SOPs in «SITE_NAME»’s Fish Health management Plan.

#### 2.7.3 Broodstock selection and handling

Broodstock are handled individually at least once. Facility personnel sorted broodstock by sex and for “ripeness”, i.e. whether or not they are fully mature. Handling individual brood fish is be done with care and with minimal stress to prevent negative effects on gametes (eggs and milt). Anaesthesia and sedation may be used to provide gentle handling and recovery.

Refer to *Broodstock selection ; Broodstock handling* SOPs in «SITE_NAME»’s Fish Health Management Plan.
2.7.4 Broodstock treatments

Broodstock may be medicated preventatively for specific infections prior to maturation, particularly for those infectious pathogens that may be transmitted “vertically”, i.e. from parent to egg. The type and timing of applied medications is determined by «SITE_NAME»’s Veterinarian and Fish Health Management Team. The medications are used according to prescription and are inventoried and recorded daily. A Material Safety Data Sheet (MSDS) for all medications used at the facility is on-site and readily accessible. «SITE_NAME» ensures that all medications are handled safely by appropriately trained staff, taking suitable precautions.

Refer to Broodstock treatments SOPs in «SITE_NAME»’s Fish Health Management Plan.

2.7.5 Gamete collection (Egg take and milt collection)

At the Veterinarian’s discretion, broodstock may be treated preventatively for specific infectious diseases prior to maturation to reduce the risk of vertical transmission of disease. Egg take and milt collection should be performed in as hygienic a manner as possible to prevent transmission of diseases to other broodstock and/or progeny. Adult fish should be anaesthetized and surface disinfected prior to gamete harvest and spawned adults should be euthanized as humanely as practicable. Carcasses are disposed of in a manner to prevent spread of disease. Males, if used multiple times, should be monitored for recovery from anaesthesia after each procedure.

Refer to Gamete collection ; Fertilization & incubation ; Egg and milt transport SOPs in «SITE_NAME»’s Fish Health Management Plan.

2.7.6 Disease screening

Disease screening procedures may be conducted at the time of spawning to mitigate risk of vertical transmission of pathogens to progeny. Tests performed are at the discretion of the Veterinarian but may include: screening for BKD (female broodstock), and viral screening in some cases. Additional testing may be performed at the discretion of the Veterinarian. Samples for disease screening are collected using aseptic technique. The location of progeny from sampled fish is tracked until such time the screening results are received and reviewed by the Veterinarian and/or Fish Health Management Team.

Refer to Diagnostic sampling protocols ; Pre-release or transfer disease risk assessment SOPs in «SITE_NAME»’s Fish Health Management Plan.

2.7.7 Identifying Progeny

Where screening programs are in effect, egg lots from individual females are clearly labeled.

2.7.8 Egg (and/or milt) transportation

Pre-arranged permits are required when eggs or milt are transported and permits must accompany the gametes during transport. Transport occurs in clean containers with secure lids. Strict disinfection and biosecurity procedures are followed to prevent transmission of pathogens to the hatchery.

Refer to Egg treatments SOPs in «SITE_NAME»’s Fish Health Management Plan.

2.7.9 Egg disinfection

Eggs are safely disinfected following fertilization and during water hardening. This disinfection is conducted when the gametes enter incubation.

Refer to Egg disinfection SOPs in «SITE_NAME»’s Fish Health Management Plan.

2.7.10 Egg treatments
Developing eggs are sensitive to light and shock as well as fungal infections. Eggs are periodically checked for mortality, and presence of infectious diseases or fungus. Affected eggs are treated as necessary.

Refer to Egg treatments SOPs in «SITE_NAME»’s Fish Health Management Plan.

2.7.11 Records

Records are kept for egg-take and broodstock pathogen screening. Records accompany each shipment of eggs from the broodstock facility to the hatchery receiving the eggs, whether destined for on-site or off-site incubation.

2.8 Fish Disease Outbreaks/Emergency

A fish health emergency is any situation where the health of a fish population is suddenly at risk. This may be due to disease-causing agents (such as a pathogenic virus) or to abrupt water quality changes (such as plankton blooms, a toxin, or a sudden, severe decline in dissolved oxygen). Vigilant monitoring, recording and early detection is key to good management of health emergencies.

An outbreak is defined as an unexpected occurrence of mortality or disease. Not all outbreaks are infectious or fish health emergencies. Infectious diseases may differ in how contagious they are and therefore how easy or difficult they are to control. Rapid response is essential but will be determined on a case-by-case basis in conjunction with the Veterinarian, the Fish Health Management Team, and/or by regulatory authority. Once an outbreak/emergency has been recognized, specific steps are followed. The objective is to keep the pathogen concentration (or load) as low as possible and to prevent spread of the problem within or off the facility. Biosecurity is enhanced.

2.8.1 System failure/Water quality event

If there is a system failure, all efforts should be directed to restoring sufficient water quality for the fish. Sufficient oxygen levels must be restored to support the fish. The site will immediately activate the Operator’s Water Quality Contingency Plan. In the event of life-threatening poor water quality events, the fish should be taken off feed in order to decrease the oxygen demand and stress.

If an infectious disease problem is suspected, the operator Veterinarian and/or Fish Health Management must be immediately notified. If the problem is not easily discerned, event management and diagnosis will need to be done hand-in-hand.

Refer to Water quality contingency planning SOPs in «SITE_NAME»’s Fish Health Management Plan.

2.8.2 Infectious disease emergencies

An outbreak is defined as an unexpected occurrence of mortality or disease. Not all outbreaks are fish health emergencies. Pathogens differ in many respects including ease of transmission, time until clinical signs of disease are apparent, severity of disease, and range of treatment options.

Accurate husbandry records and diligent monitoring of fish population health are central to the early identification of a disease situation. Rapid response is essential but should be determined on a case-by-case basis in conjunction with the Veterinarian and/or Fish Health Management.

Once an emergency has been recognized, certain steps are followed. The objective is to keep the pathogen “load” as low as possible and to prevent spread of the pathogen both within and off the site.

2.9 Emergency response steps

2.9.1 Quarantine

Quarantine is the enforced physical separation of the healthy population from a (potentially) infected population, their products or items they may have contaminated. At the Veterinarian’s recommendation
the site may be officially quarantined. Quarantine remains in effect until such time as the problem has
been diagnosed and/or managed.

Refer to Quarantine/isolation procedures for suspected disease outbreaks ; Outbreak response SOPs in
«SITE_NAME»’s Fish Health Management Plan.

2.9.2 Stop fish movement and/or handling

The movement of all fish on/off and within the site may cease and fish will not be handled further. No
visitors or non-essential staff are allowed on site unless previously authorized by Management.

Refer to Quarantine/isolation procedures for suspected disease outbreaks ; Outbreak response SOPs in
«SITE_NAME»’s Fish Health Management Plan.

2.9.3 Disinfection and hygiene

Hygiene and disinfection on site, including procedures for personnel and equipment, are strictly enforced.

Refer to Outbreak – disinfection procedures SOPs in «SITE_NAME»’s Fish Health Management Plan.

2.9.4 Suppliers

In the case of an outbreak, suppliers (e.g., feed or oxygen delivery) should be instructed to visit the site
last or to make special arrangements so that pathogen spread does not present risk other facilities.

2.9.5 Mortality collection

The frequency of mortality collection is to be increased during an outbreak. Affected tanks are mort
picked last and staff adheres to disinfection procedures between tanks and rearing units. If possible,
separate gear is designated for the affected unit. All equipment, surfaces and clothing that come in contact
with infected fish or potentially infectious material are thoroughly disinfected after use. Mortality
collection and disposal procedures, are strictly adhered to and provisions made for increased mortality
pick-ups and disposal.

2.9.6 Determining the cause of the outbreak (Outbreak investigation)

The Veterinarian may require records and appropriate sampling to determine the cause of the outbreak
and best course of action. The Veterinarian and/or Fish Health Management will provide instructions for
proper sampling. Water and feed samples may be requested. Samples must be properly handled, properly
stored and promptly shipped as per the Veterinarian’s or Fish Health Management’s instructions to ensure
prompt and effective analysis

Continued monitoring is required after the initial workup to determine the course of the outbreak and to
assess whether treatment and/or management measures are effective. Frequent observations of fish are
essential. Feeding response and water quality is monitored. All treatments and management changes are
noted as they occur. The Veterinarian, Fish Health Management and site management will work together
to review fish health records and make further management decisions. Any repeat sampling, including
results, are duly noted.

Refer to Outbreak response ; Sample shipment to a diagnostic laboratory ; Diagnostic sampling
protocol SOPs in «SITE_NAME»’s Fish Health Management Plan.

2.9.7 Site depopulation

Site depopulation is the total destruction of all animals on site in the event of a catastrophic outbreak. If
site depopulation has been agreed upon, the procedure should be conducted as humanely as possible and
in a manner consistent with principles of hygiene and biosecurity.

2.9.8 Reporting to Authorities
Where appropriate and/or in accordance with existing regulations, operator management will report the outbreak to Provincial or Federal authorities.

2.9.9 Communicating with other operators

The site management office will notify other operators in the geographic area of the outbreak.

2.10 Handling Drugs and Chemicals Properly

The goal of good fish health management is to have healthy and productive fish. However if fish do become sick, they may require treatment with a therapeutant.

2.10.1 Medicated feed: Handling, storage, and inventory

Medicated feed, if used, is stored in clearly marked bags separately from non-medicated feed. The storage area should be clean, dry and free of predators. The label on the medicated feedbag provides details about the feed, medication included, feed rate, name of the Veterinarian, prescription number and date it was milled.

Medicated feed is inventoried separately from regular feed. Daily inventory records are kept as the feed is fed to the fish according to prescription.

Refer to Medicated Feed: Storage, handling, and feeding SOPs in «SITE_NAME»’s Fish Health Management Plan.

2.10.2 Administering medicated feed

Medication mixed into feed has a Material Data Safety Sheet (MSDS) that identifies handling and safety precautions. An MSDS for all medications used on site must be on site in a readily accessible binder. Medicated feed, where used, is administered in accordance with the Veterinarian’s instructions. The appropriate rearing unit(s) receive the prescribed amount of medicated feed for the duration of treatment.

The Veterinarian must be informed if there is a lack of expected response within 5 days of the initiation of treatment.

Refer to Top-coating medicated feed SOPs in «SITE_NAME»’s Fish Health Management Plan.

2.11 Fish Health Records

Fish health records include, but are not limited to:

- Inventory records
- Includes source, number, location and lot of fish at the site
- Fish movement records
- Mortality records including clinical signs and mortality cause if known
- Diagnostic sampling records
- Diagnostic results
- Water quality records
- Therapeutics and medicated feed records
- Records of actions (other than therapeutics) taken to prevent or mitigate disease, e.g. refused shipment of potentially infected eggs
- Records of reporting to Provincial or Federal authorities, in accordance with existing regulations

Many of these records are computerized and form part of the integrated operator record keeping system. The operator will provide adequate system training and documentation to authorized site personnel including data entry and reports, e.g. ENPRO for DFO. Backups should be maintained.

Paper records not entered into a computerized system should be well organized, easily accessible and protected from damage, e.g. kept in binders.
Records should be kept for the duration of time the fish are on site. The operator will keep archived records at a suitable location in head office or securely stored off site. Records should be available for inspection upon request by the Aquaculture Management Division.

Records should be reviewed on a routine basis by the operator Veterinarian and/or Fish Health Management Team to look for patterns in fish health and disease.

2.11.1 Treatment records
As per conditions of licence, specific and detailed records of medicated feed administration are kept on site for the entire time the fish are present. In combination with inventory records, the fish groups that were treated are readily identifiable through treatment and withdrawal times. Staff are responsible for monitoring for any adverse response to treatment (i.e., lack of appetite, lack of anticipated decline in morbidity and/or mortality levels) and reporting this information to the hatchery manager and the prescribing Veterinarian. Medicated feed records should be entered into ENPRO and a hard copy should be kept on site until the fish are released. Records include:

- Location of fish culture facility
- Species and stock identification
- Name of the prescribing Veterinarian
- A log naming the drugs (therapeutants), including
  - How they were administered
  - Treatment schedule including the date treatment commenced
  - Date of last treatment
  - Name and signature of the person responsible for administering each treatment

In combination with inventory records, the fish receiving medication are readily identifiable during treatment and until the completion of the prescribed withdrawal time.

A copy of the treatment history will accompany the fish to another facility if the fish are subsequently moved. «SITE_NAME»’s does not release fish until they have cleared the withdrawal period prescribed by the Veterinarian.

2.11.2 Egg take records
Records should be kept for egg takes and broodstock disease screening. Records must accompany each shipment of eggs from the broodstock location to the hatchery receiving the eggs, whether destined for onsite or off site incubation

2.11.2.1 Disinfectants, chemicals, and biologicals
Disinfectants and chemicals are stored in clearly marked containers. An MSDS for each disinfectant at the facility is on-site and readily accessible. «SITE_NAME»’s ensures that all chemicals are handled safely by appropriately trained staff, taking suitable precautions.

Biologicals include vaccines. Where applicable, these products are stored refrigerated and handled as per manufacturer’s instructions. A product insert for any vaccine at the facility is on-site and readily accessible.

Refer to Chemicals & disinfectants: Supplies and storage SOPs in «SITE_NAME»’s Fish Health Management Plan.

2.12 Impacts on Non-Enhanced Stocks
2.12.1 Fish escape
The Salmonid Enhancement Program intentionally releases cultured fish. Escapes in this context are less of a concern than for commercial producers using non-native or selectively bred stocks. However,
infrastructure is in place to ensure fish escapes are discouraged. In the unlikely event that fish escape into nearby streams or watersheds, fish health records, including relevant diagnoses and treatments, must be made available to the appropriate regulatory authorities as required.

### 2.12.2 Juvenile release

The health and treatment status of fish is considered when planning intentional fish releases. The planned release of enhancement/conservation fish from our facilities will undergo a risk assessment to attempt to prevent undue harm to wild fish populations or public health. Fish are to be released in good health to minimize the transfer of pathogens to wild fish. The timing of release is also important to reduce stress and maximize survival of released fish.

Refer to *Pre-Release or Transfer Disease Risk Assessment and Juvenile Release* SOPs in «SITE_NAME»’s Fish Health Management Plan.
Appendix IV - Monitoring Fish Health, Disease, and Mortality

1. Use of Therapeutants

Records of the use of therapeutants shall include the following:

- Cause or diagnosis for losses
- Affected containers/lots of fish
- Species of fish affected
- Number of affected containers/lots of fish
- Estimated number of mortalities
- Name of drug used and prescription number if available
- Date treatment started
- Date treatment complete
- Withdrawal time
- Method of administration (bath, feed...)
- Amount (kg of treated feed used, weight/volume & concentration administered by bath...)
- Response description

Records of vaccines shall include the following:

- Vaccine administered (trade name)
- Vaccine lot numbers
- Date
- Fish stock/species

2. Major Mortality Event – Accidental Losses &/or Intentional Destruction Reporting

A. Accidental Mortality

In the event of an accidental large scale loss at any life-stage, it is mandatory that the facility operator report the event to the Fish Health Veterinarian within 24 hours to discuss event management, mitigation, and appropriate disposal of mortalities. Under these circumstances, use the “Major Mortality Event – Accidental Mortality Summary” report and submit it electronically to the Veterinarian and your Support Biologist.

This requirement is a condition of the Pacific Aquaculture Regulations.

B. Intentional Destruction

Under certain circumstances (e.g. disease outbreak, excessive to production target inventory), facilities may be required to intentionally destroy a significant number of eggs/fish. Facility operators are required to complete and submit, electronically, the “Major Mortality Event – Intentional Destruction Summary” report to the Veterinarian and your Support Biologist.

The Major Mortality Event reporting forms are available in the following location:

\svbcvanfp01\sep\Operations\ProjectSupport\FishHealth\Forms\
**Appendix V - Brood Summary Information**

The following information must be recorded and made available upon request by departmental staff

<table>
<thead>
<tr>
<th>Facility:</th>
<th>Contact name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of reporting:</td>
<td></td>
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</tbody>
</table>

**Stock name**

**Stock type (Mixed, Wild, Hatchery, Captive)**

**Species**

**Run (Time adults enter fresh water)**

**Brood year**

---

**Broodstock taken:**

<table>
<thead>
<tr>
<th>Females</th>
<th># used:</th>
<th># Prespawn morts:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td># used:</td>
<td># Prespawn morts:</td>
</tr>
</tbody>
</table>

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**Eggs:**

<table>
<thead>
<tr>
<th># taken:</th>
<th># Transferred out/in:</th>
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**Juveniles:**

<table>
<thead>
<tr>
<th># ponded:</th>
<th># transferred out/in:</th>
<th># on hand:</th>
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**Releases:**

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<tr>
<th>Release site:</th>
<th>Release date:</th>
<th>Release stage:</th>
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</thead>
<tbody>
<tr>
<td>Tag code/fin clip type:</td>
<td># tagged/clipped</td>
<td></td>
</tr>
<tr>
<td>Tag retention #:</td>
<td>Tag retention sample days:</td>
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<tr>
<td># unmarked:</td>
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<table>
<thead>
<tr>
<th>Total # released:</th>
<th>weight (g):</th>
<th>length (mm):</th>
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</table>

**Enumeration method:**

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Appendix VI - Fish Transfer and Release Summary Information

To be reported as stated in Section 13.1 of this licence.

Date of Report:

Facility Name:

Reporting for:  Spring Release_______ Fall Release ______

<table>
<thead>
<tr>
<th>Brood Year</th>
<th>Species</th>
<th>Stock</th>
<th>Release Stage</th>
<th>No. of Transfers In</th>
<th>No. of Transfers Out</th>
<th>Release Site</th>
<th>No. Released</th>
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Appendix VII - In-Stream Placement of Salmon Carcasses for Nutrient Enrichment

The Salmonid Enhancement Program undertakes in-stream placement of spawned salmon carcasses to provide watersheds with nutrients and organic matter derived from the ocean. Salmon carcasses play a key role in maintaining productivity of salmonid systems, benefiting aquatic and terrestrial ecosystems. Rearing juveniles consume salmon eggs, feed directly on spawned-out carcasses, and benefit from increased abundance of invertebrates and algal growth. The presence of carcasses in streams has been related to increased juvenile density, growth rate, body size, improved fish condition, improved overwintering survival and increased marine survival. Riparian vegetation also benefits from nutrients derived from decaying carcasses transported into terrestrial ecosystems by bears and other animals.

Carcass placement programs adhere to the procedures detailed in the SEP Guidelines for In-Stream Placement of Salmon Carcasses for Nutrient Enrichment. Projects that meet the terms of the carcass placement guidelines will be issued an authorization letter from the Department allowing transport for deposition of carcasses. This letter accompanies all carcass movements.

Carcass Placement Plan

The Carcass Placement Plan requires the following information:

- purpose of the carcass placement
- project proponent's name and contact Information
- location of carcass
- proposed dates of carcass placement
- spawning timing of all species in the treatment stream
- length, width and area (square metres) of stream to be treated
- biomass of carcasses to place in the treatment stream
- estimated escapement and natural biomass load in the stream
- cumulative impacts
- carcass mutilation to identify placed carcasses
- approximate stream flow at time of placement
- tethering of carcasses
- record of contact with downstream users (within 500 m) that may be impacted
- dates for post-project monitoring and follow-up report

Carcass placement records and Post-carcass Placement records are maintained for each carcass placement project and contain the following information:

Carcass Placement Records

A Carcass Placement Record is kept for each carcass placement project and contains the following information:

- permit/Authorization number
- proponent name
- donor stock/species
- placement date
- treatment stream name
- location(s) on treatment stream
- number of carcasses placed and biomass/square m of stream area
- fish health records
- type of habitat
- stream flow (low, moderate, high)
- stream temperature
- stream dissolved oxygen level at CP site(s)
- carcass mutilation
- evidence of predators

**Post Carcass Placement Records**

Monitoring of carcass placement locations is conducted two to four weeks after carcass placement and the following information is recorded for each project:

- permit/authorization number
- proponent name
- location
- placement date
- date of monitoring
- number of carcasses remaining (as a % of total placement)
- condition of carcasses (fully degraded, 50% degraded etc...)
- water flow (low, moderate, high)
- water temperature
- dissolved oxygen level
- signs of predators/carcass removal
- distance carcasses have moved downstream

Planning and record forms and associated instructions for entering information are found in the *SEP Guidelines for In-Stream Placement of Salmon Carcasses for Nutrient Enrichment.*


Appendix VIII - Licence Conditions for Net Pens operated by Enhancement Facilities

1. Containment Structures and Net Pen Support Systems

   1.1 Facility operators shall ensure that equipment used at the net pen facility is designed, constructed and maintained to meet generally accepted standards prevalent in the aquaculture industry.

   1.2 Containment structures shall be repaired or replaced with materials that meet or exceed the specifications prevalent in the aquaculture industry.

   1.3 All net pen support system weights, anchoring equipment and other equipment shall be designed, constructed, installed and maintained in a manner as to prevent entanglement, catching, chafing or abrading any component of the containment system.

   1.4 Above-water visual inspections of active net pen support systems including, anchoring-line buoy orientation and the general integrity of the anchoring system shall be conducted at all net pen facilities. Inspections shall be done daily or at a minimum, at every feeding.

   1.5 Any irregularity or damage during the visual inspection must be corrected or repaired immediately.

   1.6 A record of the visual inspection and any repairs carried out under this section must be made and a copy of the record must be retained at enhancement facility for not less than one year.

   1.7 Anchoring equipment design must be compatible with the containment structure equipment and biophysical conditions of the location.

   1.8 Anchoring equipment shall be repaired or replaced as required with materials that meet or exceed specifications generally accepted in the aquaculture industry.

   1.9 Navigation marker buoys shall be deployed as required by Transport Canada.

2. Containment Structure Design, Installation and Maintenance

   2.1 Primary net mesh shall meet or exceed 30 lb breaking strength.

   2.2 Net mesh size shall be of a size to contain smallest fish in each pen.

   2.3 Net pens shall be weighted at sufficient number of points to ensure the tension or weight is distributed evenly.

   2.4 Sufficient weight or pressure shall be used to keep net panels taut.

   2.5 Containment structures shall be stored in a manner that minimizes deterioration of the containment structure material.
2.6 Facility operators shall ensure that all tears found while handling or inspecting net pens in use or intended for use at any time are repaired immediately.

2.7 A complete visual inspection of the entire containment structure shall be completed for signs of abrasions, tears, or holes fish prior to the initial introduction of a new group of fish.

2.8 Any damage to the containment structure shall be repaired as needed.

2.9 After fish are released, nets must be washed, repaired and stored. Records of net use and servicing must be maintained for each net.

2.10 Net washing must be done in a manner that the activity does not damage fish habitat or shed fish pathogens and deleterious substances into fish habitat.

3. **Predator Control**

3.1 Net pens shall be installed and maintained such that the upper edges are secured high enough out of the water to prevent mammalian predators such as seals or otters from coming in over the top edge.

3.2 Avian predator nets (bird netting) should be stretched over the net pens to prevent fish from being taken by birds.

4. **Fish Health**

4.1 No fish shall be introduced to the net pens except in accordance with the Fish Health Management Plan (FHMP).

4.2 The FHMP of the enhancement facility shall be followed for the fish reared in net pens. Measures to control and monitor the presence of pathogens and pests in the net pens must be included in the plan.

4.3 Mortalities must be collected on a regular basis to ensure conditions set out in Section 5.5 to 5.7 of Part C of this licence are met.

4.4 Water quality in the area of the nets must be monitored before fish are transferred to the net pens and while the fish are reared in the pens to ensure the biological requirements of the fish are met.

5. **Antifouling**

5.1 All anti-fouling coatings on net pens must be in compliance with accepted industry standards.