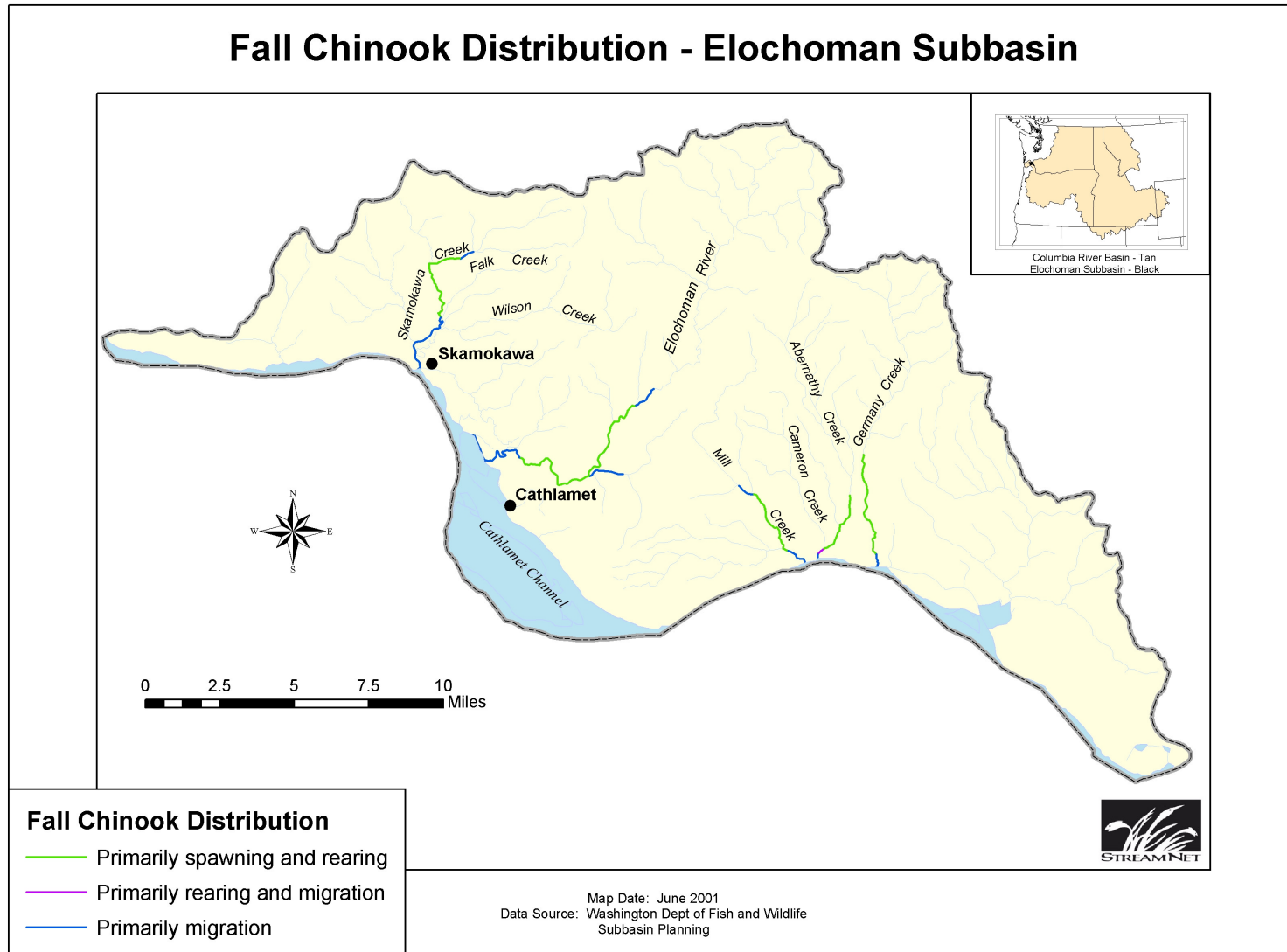
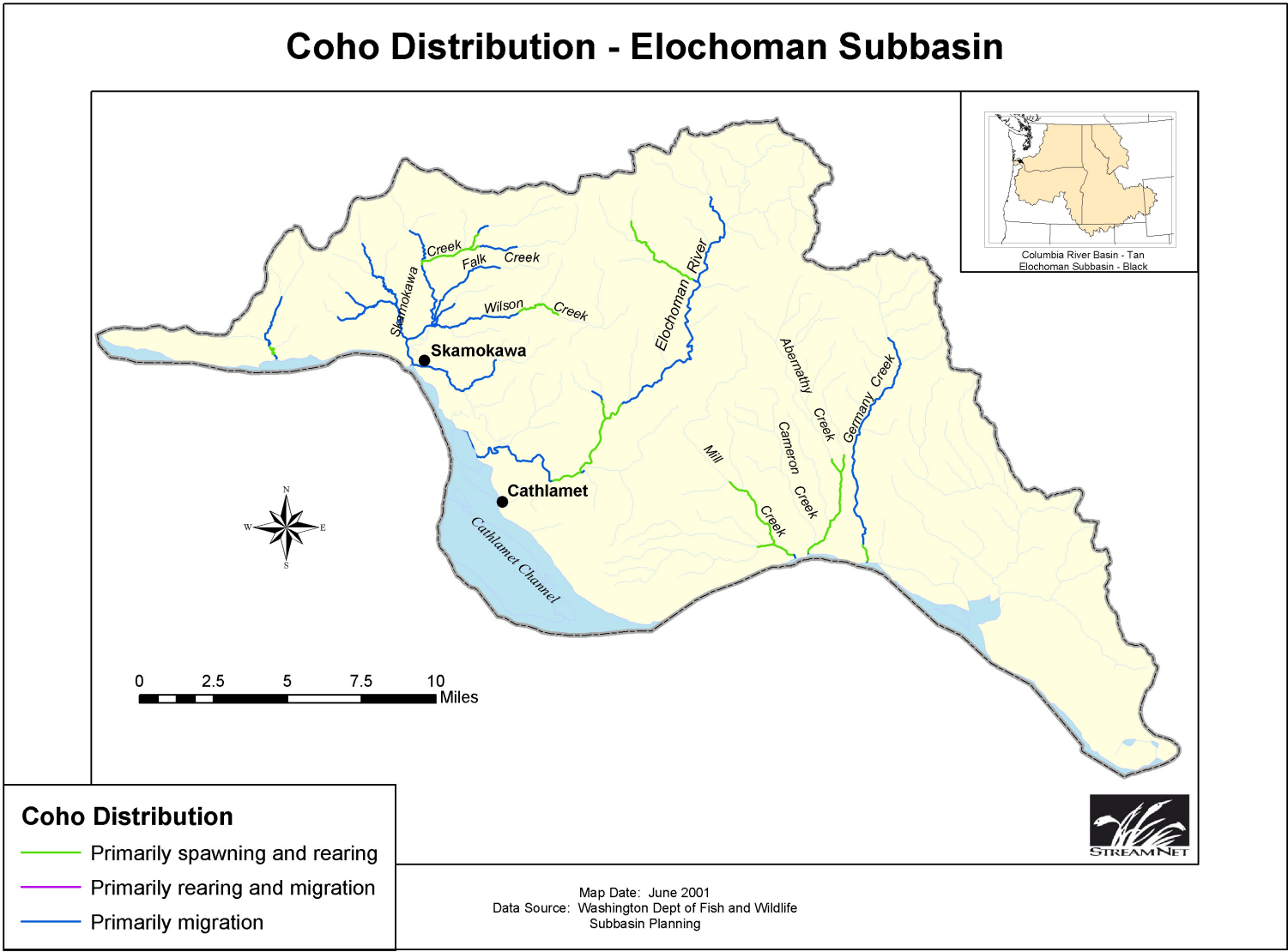


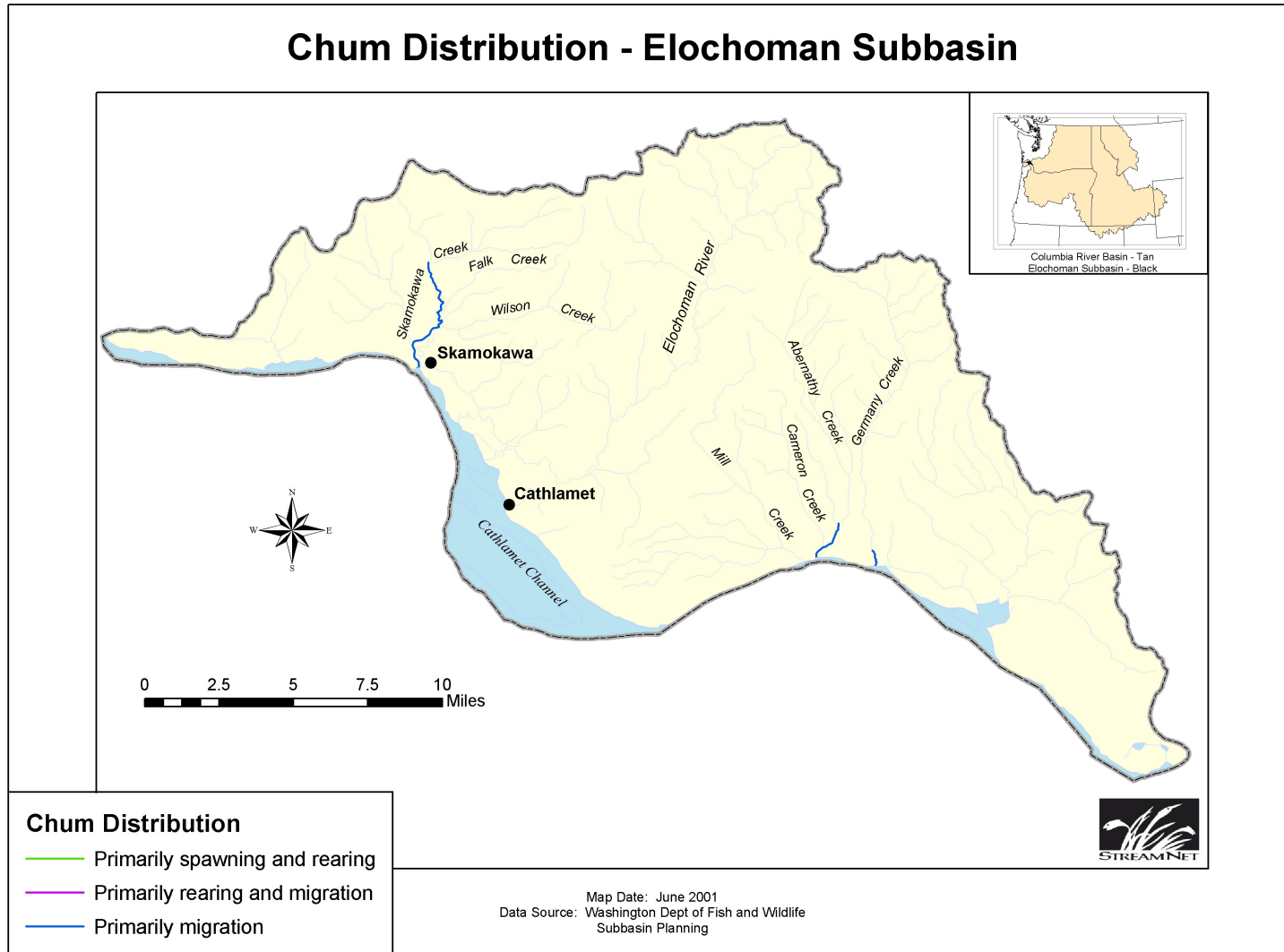
Appendix A

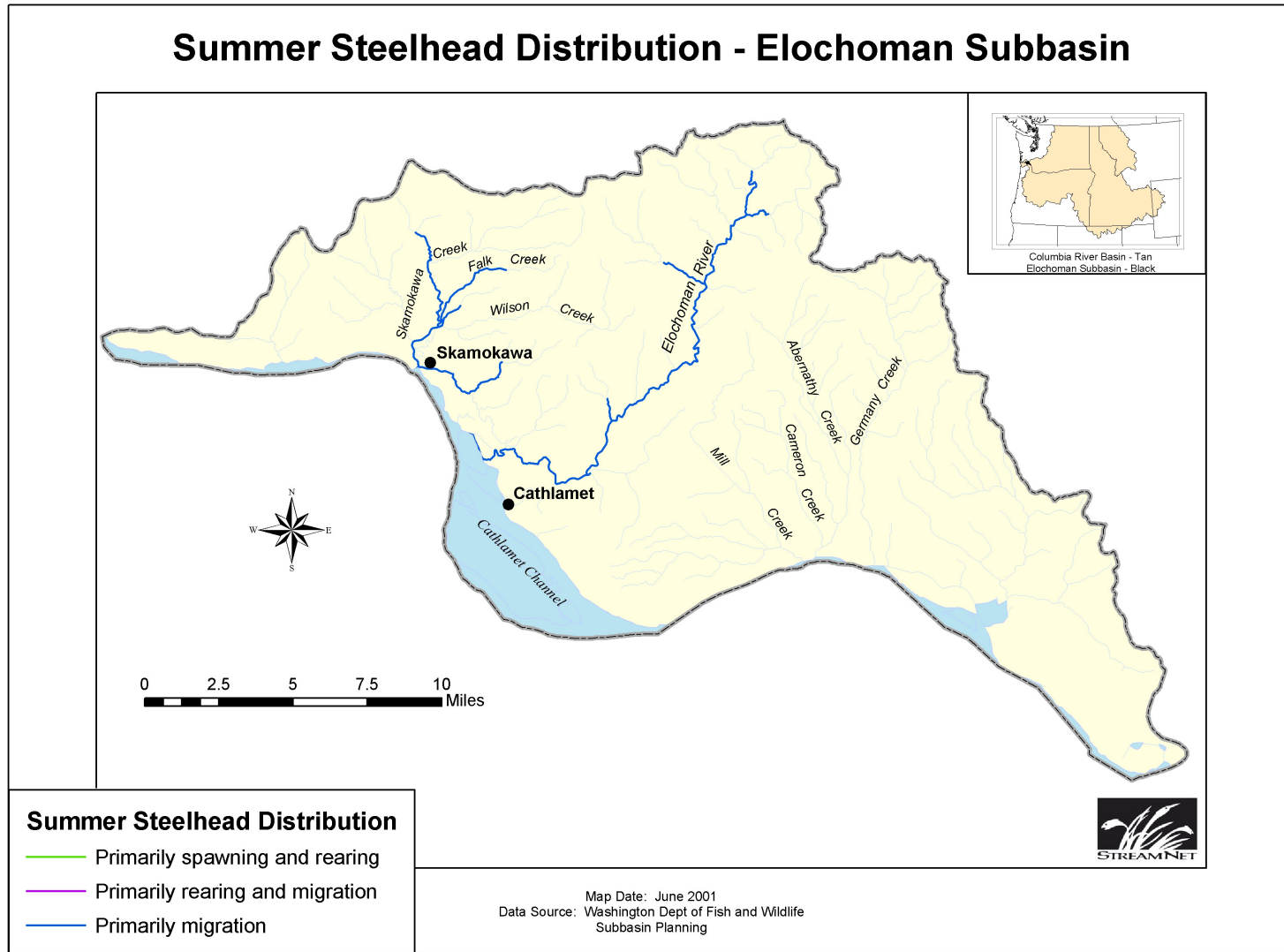
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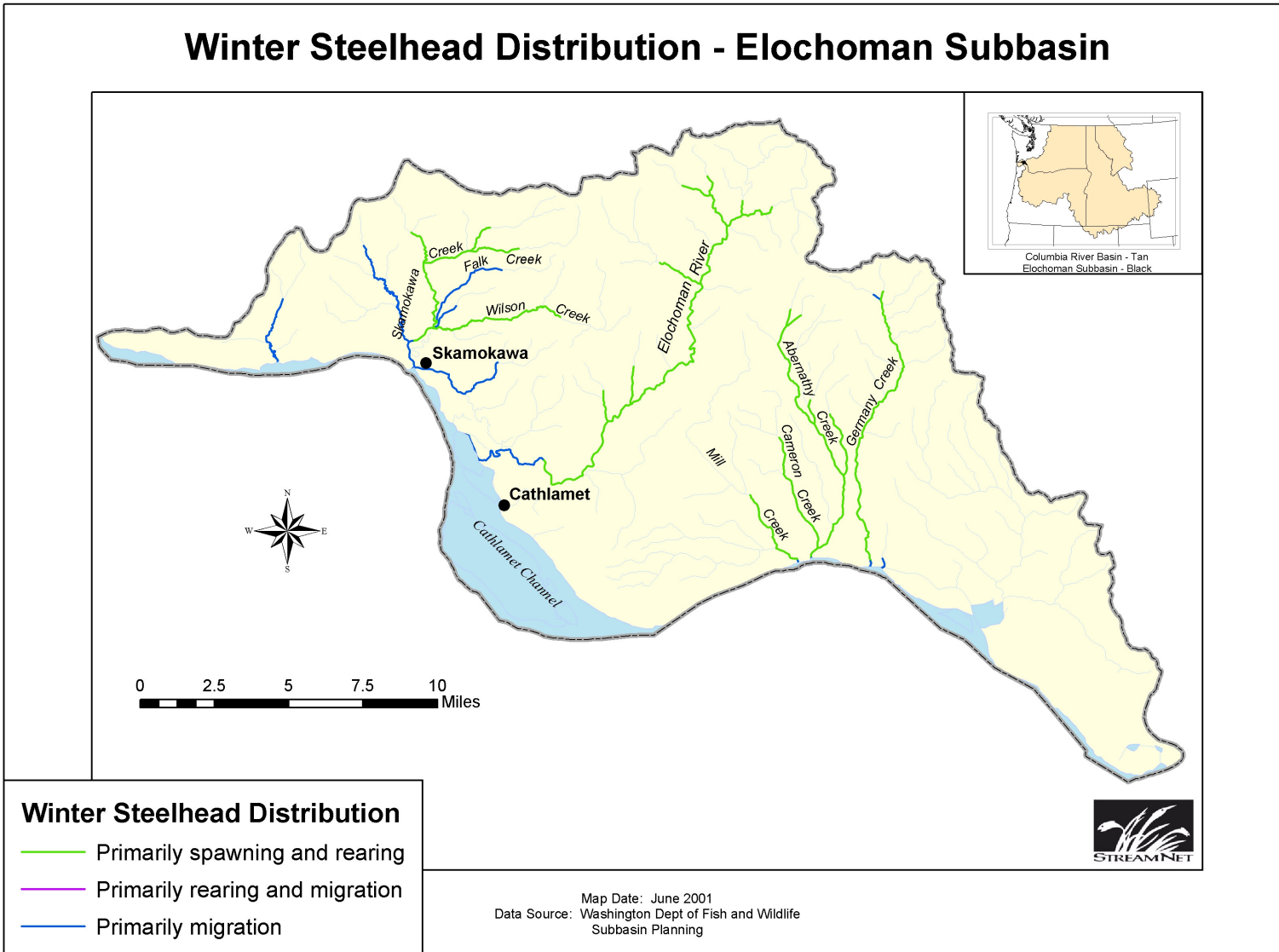
STREAMNET MAPS











Appendix B.

Hatchery and Genetic Management Plan

**HATCHERY AND GENETIC MANAGEMENT PLAN
(HGMP)**

| | |
|-----------------------------------|---|
| Hatchery Program: | Elochoman “Wild” Winter Steelhead Program |
| Species or Hatchery Stock: | “Wild” Winter Steelhead (<i>Onchorynchus mykiss</i>) Elochoman River |
| Agency/Operator: | Washington Department of Fish and Wildlife |
| Watershed and Region: | Elochoman River, tributary to Columbia River Washington state |
| Date Submitted: | July 18, 2001 |
| Date Last Updated: | July 16, 2001 |

SECTION 1. GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.

Elochoman River "Wild" Winter Steelhead Program (Lower Columbia Complex)

1.2) Species and population (or stock) under propagation, and ESA status.

Elochoman "Wild" Winter Steelhead (*Oncorhynchus mykiss*)

1.3) Responsible organization and individuals

Name(and title): Chuck Johnson, Region 5 Hatchery Operations Manager
Mark Johnson, Complex Manager

Organization Washington Department of Fish and Wildlife

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Telephone: (360) 902-2653
(360) 673-2098

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(360) 673-2995

E-mail: johnscwj@dfw.wa.gov
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Also contact: Dan Rawding (360)906-6747
rawdidr@dfw.wa.gov

Fax: (360)906-6776

Other agencies, Tribes, co-operators, or organizations involved, including contractors, and extent of involvement in the program:

The steelhead program is funded through the Mitchell Act via National Marine Fisheries Service (NMFS) for the purpose of mitigation for lost fish production due to development within the Columbia River Basin. The program is authorized under the Columbia River Fisheries Development Program, Columbia River Fish Management Plan and U.S. vs. Oregon and the parties to this program, plan and court case are therefore involved in short and long-term production planning.

1.4) Funding source, staffing level, and annual hatchery program operational costs.

Funding for this program is provided through the Mitchell Act via National Marine Fisheries Service (NMFS).

1.5) Location(s) of hatchery and associated facilities.

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Broodstock are captured at the hatchery site trap on the Elochoman River (25.0236) at approximately RM 12. The ladder and trap are located at the upstream end of the hatchery compound adjacent to a permanent barrier. Incubation, rearing and release take place at same site.

1.6) Type of program.

Integrated harvest.

1.7) Purpose (Goal) of program.

The goal of this program is to mitigate for the loss of "wild" winter steelhead due to the development in the Columbia River basin and to replace the ongoing program with the indigenous stock..

1.8) Justification for the program.

This hatchery program will be operated to provide fish for harvest while minimizing adverse effects on listed fish. This will be accomplished in the following manner:

1. Hatchery fish will be released as smolts at a time to minimize or eliminate adverse interactions with listed fish.
2. Only appropriate stocks will be propagated.
3. Hatchery fish will be externally marked to distinguish them from wild fish.
4. Fish will be acclimated before release when possible.
5. Hatchery fish will be propagated using appropriate fish culture methods and consistent with the Co-Managers' Disease Policy, spawning and genetic guidelines and state and federal water quality standards.
6. These hatchery fish will be harvested at a rate that does not adversely effect wild fish.
7. Juvenile fish produced in excess to production goals will be dealt with appropriately.

1.9) List of program [Performance Standards].

1.10) List of program [Performance Indicators], designated by "benefits" and "risks."

Performance Standards and Indicators for lower Columbia River **Integrated Harvest** Steelhead programs.

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| Performance Standard | Performance Indicator | Monitoring and Evaluation Plan |
|--------------------------------|---|---|
| Produce adult fish for harvest | Survival and contribution rates | Monitor catch and measuring survivals by periodical CWT data |
| Meet hatchery production goals | Number of juvenile fish released | Estimating number of fish planted (weighing / counting fish), monitoring proximity to hatchery production goals, number released recorded on hatchery divisions "plant reports", data available on WDFW data base. Future Brood Document (FBD). |
| Manage for adequate escapement | Hatchery and wild return rates Catch rates | Monitoring hatchery/wild return rates through trapping (at the hatchery or at weir), spawning ground surveys plus catch records. |

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| | | |
|---|---|--|
| Minimize interactions with listed fish through proper broodstock management | Total number of broodstock collected | Measuring number of fish actually spawned and killed to meet egg take goal at the hatchery. Hatchery records. |
| | Sex ratios | Hatchery records |
| | Timing of adult collection | |
| | Number of listed fish passed upstream | Start trapping prior to historical start of the run, continue trapping throughout the run, dates and times are recorded on hatchery divisions "adult reports", data available on WDFW data base. |
| | Hatchery stray rate | |
| | Number wild fish used in broodstock | |
| | Return timing of hatchery / wild adults | Hatchery records. |
| | Adherence to spawning guidelines | CWT data and spawning ground surveys Hatchery records Hatchery records Spawning guidelines |

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| | | |
|--|--|---|
| Minimize interactions with listed fish through proper rearing and release strategies | Juveniles released as smolts | FBD and hatchery records |
| | Outmigration timing of listed fish / hatchery fish | Hatchery records and historical natural out-migrant data |
| | Size, time and area of release | |
| | Hatchery stray rates | FBD and hatchery records CWT data and mark / unmarked ratios of adults |
| Maintain stock integrity and genetic diversity | Effective population size | Spawning guidelines |
| | Hatchery-Origin Recruit spawners | Spawner surveys |

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| | | |
|--|--|---|
| <p>Maximize in-hatchery survival of broodstock and their progeny; and</p> <p>Limit the impact of pathogens associated with hatchery stocks, on listed fish</p> | <p>Fish pathologists will monitor the health of hatchery stocks on a monthly basis and recommend preventative actions / strategies to maintain fish health</p> | <p>Co-Managers Disease Policy</p> <p>Fish Health Exam Reports</p> |
| | <p>Fish pathologists will diagnose fish health problems and minimize their impact</p> | |
| | <p>Vaccines will be administered when appropriate to protect fish health</p> | |
| | <p>A fish health database will be maintained to identify trends in fish health and disease and implement fish health management plans based on findings</p> | |
| | <p>Fish health staff will present workshops on fish health issues to provide continuing education to hatchery staff.</p> | |
| <p>Ensure hatchery operations comply with state and federal water quality standards through proper environmental monitoring</p> | <p>NPDES compliance</p> | <p>Monthly NPDES records</p> |

1.11) Expected size of program.

1.11.1) Proposed annual broodstock collection level (maximum number of adult fish).

20 adults (10 males and 10 females).

1.11.2) Proposed annual fish release levels (maximum number) by life stage and location.

| Life Stage | Release Location | Annual Release Level |
|------------|-------------------------------------|----------------------|
| Eyed Eggs | | |
| Unfed Fry | | |
| Fry | | |
| Fingerling | | |
| Smolts | Elochoman River (25.0236), RM 12 | 30,000 |

1.12) Current program performance, including estimated smolt-to-adult survival rates, adult production levels, and escapement levels. Indicate the source of these data.

No adult returns yet.

1.13) Date program started (years in operation), or is expected to start.

2000 brood year.

1.14) Expected duration of program.

Ongoing.

1.15) Watersheds targeted by program.

Elochoman River (25.0236).

1.16) Indicate alternative actions considered for attaining program goals, and reasons why those actions are not being proposed.

None applicable.

SECTION 2. PROGRAM EFFECTS ON ESA-LISTED SALMONID POPULATIONS.

2.1) List all ESA permits or authorizations in hand for the hatchery program.

None.

2.2) Provide descriptions, status, and projected take actions and levels for ESA-listed natural populations in the target area.

2.2.1) Description of ESA-listed salmonid population(s) affected by the program.

The National Marine Fisheries Service has designated Evolutionary Significant Units (ESU) for steelhead populations in Washington. Steelhead from the mouth of the Columbia to Coal Creek are part of the Southwest Washington ESU. While WDFW considers these populations depressed, these fish are not listed under the Endangered Species Act.

Wild winter steelhead in the lower Columbia River tributaries enter tributaries from November through June with peak entry in April. Spawning take place from February through June with peak spawning from late April though mid-May depending on environmental conditions. Peak spawning time for hatchery steelhead is in mid-January, at least three months earlier than these wild stocks.

In general wild steelhead spawn in the middle to upper mainstem and tributaries. Release sites for hatchery steelhead are at hatchery/acclimation site with collection facilities, or unacclimated releases occur in the lower mainstem or lower tributaries away from primary wild steelhead spawning areas.

- Identify the ESA-listed population(s) that will be directly affected by the program.

None.

- Identify the ESA-listed population(s) that may be incidentally affected by the program.

Lower Columbia Chinook and Chum; Mid Columbia Steelhead; Upper Columbia Steelhead and Spring Chinook; Snake River Sockeye, Chinook and Steelhead; Willamette Steelhead and Chinook; Columbia River Bull Trout.

2.2.2) Status of ESA-listed salmonid population(s) affected by the program.

- Describe the status of the listed natural population(s) relative to “critical” and “viable” population thresholds (see definitions in [Attachment 1]).

Critical and viable population thresholds have not been established for the above ESU's and the populations within them. NMFS has formed a Lower Columbia River/Willamette River Technical Review Team to review population status within these ESU's and develop critical and viable population thresholds.

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The SASSI report (WDFW) describes the status of winter steelhead in the Elochoman as "depressed".

- Provide the most recent 12 year (e.g. 1988-present) progeny-to-parent ratios, survival data by life-stage, or other measures of productivity for the listed population. Indicate the source of these data.

Not available.

- Provide the most recent 12 year (e.g. 1988-1999) annual spawning abundance estimates, or any other abundance information. Indicate the source of these data.

Not available.

- Provide the most recent 12 year (e.g. 1988-1999) estimates of annual proportions of direct hatchery-origin and listed natural-origin fish on natural spawning grounds, if known.

Not available.

2.2.3) Describe hatchery activities, including associated monitoring and evaluation and research programs, that may lead to the take of listed fish in the target area, and provide estimated annual levels of take (see "Attachment 1" for definition of [take]).

- Describe hatchery activities that may lead to the take of listed salmonid populations in the target area, including how, where, and when the takes may occur, the risk potential for their occurrence, and the likely effects of the take.

Wild winter run steelhead for use as broodstock are trapped between March 15th and June 1st. Listed stocks of salmonids are not anticipated to be in this area during this time frame.

Winter run steelhead not used as broodstock are trapped throughout the capture period. Fish volitionally enter the trap via a step and pool ladder at Elochoman Hatchery. The fish are held for a short period, less than 72 hours, at which time counts are taken, and the fish are either returned to the river or sequestered as broodstock to be spawned in spring.

- Provide information regarding past takes associated with the hatchery program, (if known) including numbers taken, and observed injury or mortality levels for listed fish.

The year 2000 is the first year of trapping adult steelhead during their spawning run. No historical data for takes of listed fish exists.

- Provide projected annual take levels for listed fish by life stage (juvenile and adult) quantified (to the extent feasible) by the type of take resulting from the hatchery program (e.g. capture, handling, tagging, injury, or lethal take).

Wild winter run steelhead for use as broodstock are trapped between March 15th and June 1st. Listed stocks of salmonids are not anticipated to be in this area during this time frame.

- Indicate contingency plans for addressing situations where take levels within a given year have exceeded, or are projected to exceed, take levels described in this plan for the program.

Rates of adult collection for broodstock will be reduced (as will program size) if total adult return appears to decline substantially. Hatchery procedures and research protocols are monitored and reviewed so that the work can be adaptively modified to minimize risk to the threatened fish and maximize potential for success of the program.

SECTION 3. RELATIONSHIP OF PROGRAM TO OTHER MANAGEMENT OBJECTIVES

3.1) Describe alignment of the hatchery program with any ESU-wide hatchery plan (e.g. Hood Canal Summer Chum Conservation Initiative) or other regionally accepted policies (e.g. the NPPC Annual Production Review Report and Recommendations - NPPC document 99-15). Explain any proposed deviations from the plan or policies.

The Elochoman wild winter broodstock hatchery program is integrated into the Lower Columbia Steelhead Conservation Initiative.

3.2) List all existing cooperative agreements, memoranda of understanding, memoranda of agreement, or other management plans or court orders under which program operates.

The program is authorized under the Columbia River Fisheries Development Program, and U.S. vs. Oregon.

3.3) Relationship to harvest objectives.

Selective fisheries were initiated for winter steelhead in 1986 in the lower Columbia River tributaries. This regulation requires the release of all wild steelhead. The estimated mortality for wild winter steelhead for these fisheries in lower Columbia River tributaries ranges from 0% to less than 3% per basin depending on the fishing regulations. Harvest rates have been as high as 70% for hatchery steelhead in the Cowlitz River. On the Kalama River harvest rates for hatchery fish are believed to range from 40% to 70% and

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averaged near 50%. Until wild steelhead populations have recovered, wild steelhead release regulations will be in effect with incidental mortality limited to less than 3% on wild stocks. We expect that the harvest rate of hatchery fish will remain greater than 40% for most stocks.

3.3.1) Describe fisheries benefiting from the program, and indicate harvest levels and rates for program-origin fish for the last twelve years (1988-99), if available.

Fisheries benefiting from the program will include sport fisheries in the Elochoman Basin and the lower Columbia mainstem. The program is new and no adults have returned yet. A formal harvest management plan is in development. Pending decisions by NMFS on the harvest of adult offspring of listed wild broodstock, the expectation is that harvest will occur at a level that, (1) ensures natural escapement of at least enough fish to replace broodstock removed from production and (2) avoids a genetic swamping effect of hatchery fish on wild fish.

3.4) Relationship to habitat protection and recovery strategies.

The extended freshwater residency of steelhead and the anadromous forms migratory patterns require specific and varied freshwater and estuary habitat types. These ecosystems have been degraded by past and present human activities that have reduced the habitat quality, quantity, and complexity. The primary land use activities responsible for these include: road building, timber harvesting, agriculture, and rural development. These upslope and riparian activities have increased sediment, altered woody debris availability and recruitment, increased water temperatures, changed runoff patterns, and reduced river flow. A limiting factor analyses for steelhead in the Elochoman watershed (WRIA #25) is currently under development.

Most lands in these watersheds are managed for timber production. The riparian zone is simple and in early successional stages and as a result summer time temperatures are elevated and large woody debris is lacking. North Fork Elochoman River Watershed Analysis indicated that increased fine sediment limits fish production (DNR 1995). Increases in fine sediment decreases survival of trout eggs and alevins, reduces stream productivity and ultimately food availability, and decrease the size and depth of pools. Large pools (> 50 yds. square and > 6 ft. deep) have been reduced by 84% on the Elochoman River since 1945 (USFS et al, 1993). Increases in large woody debris would increase fish productivity by forming and maintaining pools, providing fish cover, and trapping spawning gravel.

Winter steelhead use the Columbia River estuary primarily during the winter and spring. It was estimated that the tidelands, swamps, and wetlands in the Columbia River estuary were reduced by 40% from 1870 to 1970 (Sherwood et al. 1990). The recent changes in ocean current patterns, such as El Nino have reduced smolt to adult survival of all Columbia River salmonids. Smolt to adult survival of hatchery steelhead in the lower

Columbia have decreased since the 1980's. Reduction in estuary habitat and poor ocean conditions have contributed to the recent decline of steelhead trout.

Recent changes in the Forest Practices Act and proposed habitat enhancement and restoration projects by the Cowlitz and Wahkiakum Conservation District, and private groups will improve anadromous production. However, restoring ecosystem function will take decades.

3.5) Ecological interactions.

Northern pikeminnow (*Ptychocheilus oregonensis*) are found in the lower reaches of the mainstem Elochoman and in Elochoman Slough and have been observed preying upon juvenile salmonids. The common merganser (*Mergus merganser*) and Caspian tern (*Sterna carpia*) have been observed preying on juvenile salmonids in the Elochoman River and Columbia Estuary. Twenty one percent of returning Elochoman winter steelhead from 1983 through 1998 were observed with pinniped scarring from California sea lions (*Zalophus californianus*) and Pacific harbor seals (*Phoca vitulina*).

SECTION 4. WATER SOURCE

4.1) Provide a quantitative and narrative description of the water source (spring, well, surface), water quality profile, and natural limitations to production attributable to the water source.

The hatchery water source and "natal" water source used by naturally spawning populations are the same. Water rights for hatchery operations total 45 cubic feet per second (cfs). All water quality parameters are monitored under the NPDES permit number WAG13-1008.

4.2) Indicate risk aversion measures that will be applied to minimize the likelihood for the take of listed natural fish as a result of hatchery water withdrawal, screening, or effluent discharge.

Hatchery intake screens conform with NMFS screening guidelines to minimize the risk of entrainment of juvenile listed fish. Effluent discharge is in compliance with NPDES standards.

SECTION 5. FACILITIES

5.1) Broodstock collection facilities (or methods).

The collection of the wild winter steelhead is done at the Elochoman Hatchery. The steelhead are recruited through a step and pool ladder system and are diverted into a dirt bottom holding pond measuring approximately 5,625 square feet.

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5.2) Fish transportation equipment (description of pen, tank truck, or container used).

No transportation is needed.

5.3) Broodstock holding and spawning facilities.

The broodstock are held in a 70' x 80' x 4 (22,400 cu.ft.) earthen pond. This pond has the capability of 3,000 gallons per minute (gpm) flow (1,000 gallon fresh river water and 2,000 gallon reuse water). Spawning of the wild steelhead takes place inside the hatchery building.

5.4) Incubation facilities.

Incubation is done in vertical style incubators with flows set at 4 gpm.

5.5) Rearing facilities.

The rearing facilities consist of 4 intermediate troughs measuring 3' X 3' X 16' with a maximum flow of 50 gpm for fry and fingerling rearing and 20 ponds measuring 20' X 90' X 2' (3,600 cubic feet) with a max. flow of 250 gpm per pond for continued fingerling and early yearling rearing.

5.6) Acclimation/release facilities.

Smolts are volitionally released from the 90,300 cubic feet asphalt rearing pond, starting the middle of April through the end of May.

5.7) Describe operational difficulties or disasters that led to significant fish mortality.

This is the first year of production on these fish and no significant mortality has occurred. Flood events can lead to inundation of the rearing ponds with flood waters. Fish stocks are generally managed away from these areas during likely times that flooding would occur.

5.8) Indicate available back-up systems, and risk aversion measures that will be applied, that minimize the likelihood for the take of listed natural fish that may result from equipment failure, water loss, flooding, disease transmission, or other events that could lead to injury or mortality.

The hatchery is staffed full time and equipped with low water alarms on all fish rearing vessels and incubation facilities. Fish disease transmission is managed in accordance with the agency fish disease policy.

SECTION 6. BROODSTOCK ORIGIN AND IDENTITY

Describe the origin and identity of broodstock used in the program, its ESA-listing status, annual collection goals, and relationship to wild fish of the same species/population.

6.1) Source.

Broodstock for this program has been obtained from returning wild adults to the Elochoman River.

6.2) Supporting information.

6.2.1) History.

This is the first year of this program.

6.2.2) Annual size.

This program will be comprised of 100% wild stock (10 females and 10 males).

6.2.3) Past and proposed level of natural fish in broodstock.

This program will be comprised of 100% wild stock.

6.2.4) Genetic or ecological differences.

This program will be comprised of 100% wild stock.

6.2.5) Reasons for choosing.

Indigenous stock.

6.3) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish that may occur as a result of broodstock selection practices.

The risk of among population genetic diversity loss will be reduced by selecting the indigenous steelhead population for use as broodstock in the program. Broodstock will be collected randomly during the peak migration timing of the wild stock to minimize potential for altering that characteristics of the wild population.

SECTION 7. BROODSTOCK COLLECTION

7.1) Life-history stage to be collected (adults, eggs, or juveniles).

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Adults.

7.2) Collection or sampling design.

Adult steelhead are collected each year from the run at large reaching Elochoman Hatchery trap between mid-March and the first of June. Capture efficiency is being evaluated at this time. Broodstock is selected randomly throughout the time period of the run at large.

7.3) Identity.

Wild origin fish return at a later timing than hatchery origin fish and are identified by the presence of an adipose fin and lack of erosion of the dorsal fin.

7.4) Proposed number to be collected:

7.4.1) Program goal (assuming 1:1 sex ratio for adults):

20 adults.

7.4.2) Broodstock collection levels for the last twelve years (e.g. 1988-99), or for most recent years available:

| Year | Adults Females | Males | Jacks | Eggs | Juveniles |
|------|-------------------|-------|-------|------|-----------|
| 1988 | | | | | |
| 1989 | | | | | |
| 1990 | | | | | |
| 1991 | | | | | |
| 1992 | | | | | |
| 1993 | | | | | |
| 1994 | | | | | |
| 1995 | | | | | |
| 1996 | | | | | |
| 1997 | | | | | |
| 1998 | | | | | |
| 1999 | | | | | |

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| Year | Adults Females | Males | Jacks | Eggs | Juveniles |
|------|-------------------|-------|-------|--------|-----------|
| | 36 | 38 | | 49,103 | |

Data source: (Link to appended Excel spreadsheet using this structure. Include hyperlink to main database)

7.5) Disposition of hatchery-origin fish collected in surplus of broodstock needs.

Hatchery-origin broodstock are not collected during this time frame.

7.6) Fish transportation and holding methods.

Adult fish are generally captured in ripe or near ripe condition. Fish may be held for a period of 24 to 72 hours prior to handling for spawning and/or returning to the stream.

7.7) Describe fish health maintenance and sanitation procedures applied.

Standard fish health protocols as defined in the Co-managers Fish Health Manual (WDFW 1996) are adhered to.

7.8) Disposition of carcasses.

All fish live-spawned and returned to river. Incidental mortalities are necropsied to determine cause of death and disposed of in a landfill.

7.9) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the broodstock collection program.

The risk of fish disease amplification will be minimized by following Co-manager Fish Health Policy sanitation and fish health maintenance and monitoring guidelines.

SECTION 8. MATING

Describe fish mating procedures that will be used, including those applied to meet performance indicators identified previously.

8.1) Selection method.

Unclipped fish are selected randomly from the returning adults. Ripe fish are spawned in two to three egg takes approximately one week apart at the time of historical peak run time for the stock. Spawners are randomly selected from fish available on those days.

8.2) Males

A back-up male is used.

8.3) Fertilization.

The current fertilization protocol involves a modification of partial factorial crosses (2X2). Eggs from two females were split into two lots each (by weight) yielding four aliquots of eggs. Half of the eggs from each female were fertilized with milt from one male. Fifteen seconds after the initial fertilization, an aliquot of milt from a second male was used to back up the first. The remaining two buckets of eggs were treated similarly except that the second male was used as the primary source of milt and the first male became the backup.

Fish health procedures used for disease prevention include water hardening of eggs in an iodophor solution at spawning and biological sampling of spawners. Ovarian fluid samples are collected from female spawners to test for the presence of viral pathogens.

8.4) Cryopreserved gametes.

None.

8.5) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the mating scheme.

Only un-clipped wild-origin fish will be used for this program.

SECTION 9. INCUBATION AND REARING

Specify any management goals (e.g. [egg to smolt survival]) that the hatchery is currently operating under for the hatchery stock in the appropriate sections below. Provide data on the success of meeting the desired hatchery goals.

9.1) Incubation:

9.1.1) Number of eggs taken and survival rates to eye-up and/or ponding.

As of June 2000, the first year of this program, the eggs are not yet eyed and no data is available. Approximately 49,000 eggs have been taken.

9.1.2) Cause for, and disposition of surplus egg takes.

Extra eggs are taken as a measure against expected incubation mortality. If the program level of production is exceeded, adjustments will be made to the hatchery origin portion of the facility production by utilizing local land locked lakes for fry stocking.

9.1.3) Loading densities applied during incubation.

Average size of the eggs for the 2000 brood year has been 3,000 eggs per pound prior to water hardening. Average eggs per female has been estimated at 3,100. The eggs are incubated in vertical incubators with 4gpm of flow. Each individual females eggs are put down in individual incubator trays.

9.1.4) Incubation conditions.

Temperatures are monitored daily and range between 48 and 52 degrees Fahrenheit. Dissolved oxygen is generally at or near saturation at the influent with 7 parts per million (ppm) as the minimum acceptable effluent. Visual monitoring of sediments in the incubators is conducted daily; these are flushed if necessary.

9.1.5) Ponding.

Ponding of this stock has not occurred as of yet (February) and it will be forced.

9.1.6) Fish health maintenance and monitoring.

Current treatment is a 1,667 ppm drip of formalin for 15 minutes daily to control fungus on the eggs. Egg mortality is removed by hand picking. Fry mortality at ponding is generally less than 3%. Monitoring for disease is done on a continuous basis with monthly scheduled visits by the area Fish Health Specialist. Disease treatment varies with the pathogen encountered but generally is antibiotic in nature for bacterial infections and bath or drip treatments with chemotheraputants for external infections.

9.1.7) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish during incubation.

The water source for incubation is regarded as pathogen free and particulate matter is settled out prior to entering incubation units.

9.2) Rearing:

9.2.1) Provide survival rate data (*average program performance*) by hatchery life stage (fry to fingerling; fingerling to smolt) for the most recent twelve years (1988-99), or for years dependable data are available.

No data available

9.2.2) Density and loading criteria (goals and actual levels).

No data available.

9.2.3) Fish rearing conditions

Temperature and dissolved oxygen are monitored and recorded daily during fish rearing. Temperatures during the rearing cycle range from a high of 80 to a low of 32 degrees F. Ponds are vacuum cleaned on an as needed basis although generally weekly. Netting covers the rearing ponds to dissuade predator intrusion.

9.2.4) Indicate biweekly or monthly fish growth information (*average program performance*), including length, weight, and condition factor data collected during rearing, if available.

No data available for this stock.

9.2.5) Indicate monthly fish growth rate and energy reserve data (*average program performance*), if available.

No data available for this stock.

9.2.6) Indicate food type used, daily application schedule, feeding rate range (e.g. % B.W./day and lbs/gpm inflow), and estimates of total food conversion efficiency during rearing (*average program performance*).

Dry diets are/will be used. Feed rate is applied in accordance with program goals not to exceed 0.1 to 0.15 lbs of feed per gallon per minute inflow depending on fish size. Average season feed conversion rates are generally expected to be no greater than 1.3 : 1.

9.2.7) Fish health monitoring, disease treatment, and sanitation procedures.

Fish health is monitored daily. Regularly scheduled monthly visits are conducted by the area Fish Health Specialist. Treatment for disease is conducted under the advisement of the Fish Health Specialist. Sanitation procedures are done in accordance with the Co-managers Fish Health Manual, (WDFW 1996).

9.2.8) Smolt development indices (e.g. gill ATPase activity), if applicable.

NA

9.2.9) Indicate the use of "natural" rearing methods as applied in the program.

None at this time.

9.2.10) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish under propagation.

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Fish will be reared to smolt size in one year to mimic the natural fish emigration strategy.

SECTION 10. RELEASE

Describe fish release levels, and release practices applied through the hatchery program.

10.1) Proposed fish release levels.

| Age Class | Maximum Number | Size (fpp) | Release Date | Location |
|------------|----------------|------------|--------------|-----------------|
| Eggs | | | | |
| Unfed Fry | | | | |
| Fry | | | | |
| Fingerling | | | | |
| Smolts | 30,000 | 5 | 4-5/2001 | Elochoman River |

10.2) Specific location(s) of proposed release(s).

Stream, river, or watercourse: Elochoman River (25.0236)
Release point: RM 12
Major watershed: Elochoman River (25.0236)
Basin or Region: Lower Columbia River

10.3) Actual numbers and sizes of fish released by age class through the program.

| Release year | Eggs/ Unfed Fry | Avg size | Fry | Avg size | Fingerling | Avg size | Yearling | Avg size |
|--------------|-----------------|----------|-----|----------|------------|----------|----------|----------|
| 1988 | | | | | | | | |
| 1989 | | | | | | | | |
| 1990 | | | | | | | | |
| 1991 | | | | | | | | |
| 1992 | | | | | | | | |
| 1993 | | | | | | | | |
| 1994 | | | | | | | | |
| 1995 | | | | | | | | |
| 1996 | | | | | | | | |
| 1997 | | | | | | | | |
| 1998 | | | | | | | | |
| 1999 | | | | | | | 21,000* | |

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| Release year | Eggs/ Unfed Fry | Avg size | Fry | Avg size | Fingerling | Avg size | Yearling | Avg size |
|--------------|-----------------|----------|-----|----------|------------|----------|----------|----------|
| Average | | | | | | | | |

Data source: (Link to appended Excel spreadsheet using this structure. Include hyperlink to main database)

*-Recent information from regional staff (July 16, 2001).

10.4) Actual dates of release and description of release protocols.

Releases will occur in April - May of 2001. Final development of release protocols is pending, but will include a volitional migration.

10.5) Fish transportation procedures, if applicable.

NA

10.6) Acclimation procedures.

Fish will be acclimated on surface water prior to release.

10.7) Marks applied, and proportions of the total hatchery population marked, to identify hatchery adults.

Final determination of exact marks is pending. Fish will be adipose-fin clipped.

10.8) Disposition plans for fish identified at the time of release as surplus to programmed or approved levels.

In the event of surplus fish to the program, total program numbers will be reduced through the reduction of hatchery-origin smolts planted. Hatchery-origin smolts, if in surplus numbers, will be planted in local land-locked ponds and lakes.

10.9) Fish health certification procedures applied pre-release.

As set forth in the Co-managers Fish Health Manual (WDFW, 1996)

10.10) Emergency release procedures in response to flooding or water system failure.

Every effort will be made to avoid pre-programmed releases including transfer to alternate facilities. The water system is gravity fed and generally continues to flow during flood events. Emergency releases, if necessary, would be managed by removal of outlet screens and stoplogs of the rearing vessel.

10.11) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from fish releases.

All fish will be released in smolting condition to minimize their retention and interaction with natural and listed fish stocks within the system prior to seaward migration.

SECTION 11. MONITORING AND EVALUATION OF PERFORMANCE INDICATORS

11.1) Monitoring and evaluation of [Performance Indicators] presented in Section 1.10.

11.1.1) Describe plans and methods proposed to collect data necessary to respond to each [Performance Indicator] identified for the program.

See section 1.10.

11.1.2) Indicate whether funding, staffing, and other support logistics are available or committed to allow implementation of the monitoring and evaluation program.

11.2) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from monitoring and evaluation activities.

SECTION 12. RESEARCH

12.1) Objective or purpose.

12.2) Cooperating and funding agencies.

12.3) Principal investigator or project supervisor and staff.

12.4) Status of stock, particularly the group affected by project, if different than the stock(s) described in Section 2.

12.5) Techniques: include capture methods, drugs, samples collected, tags applied.

12.6) Dates or time period in which research activity occurs.

12.7) Care and maintenance of live fish or eggs, holding duration, transport methods.

12.8) Expected type and effects of take and potential for injury or mortality.

12.9) Level of take of listed fish: number or range of fish handled, injured, or killed by sex, age, or size, if not already indicated in Section 2 and the attached [take table] (Table 1).

12.10) Alternative methods to achieve project objectives.

12.11) List species similar or related to the threatened species; provide number and causes of mortality related to this research project.

12.12) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse ecological effects, injury, or mortality to listed fish as a result of the proposed research activities.

SECTION 13. ATTACHMENTS AND CITATIONS

Washington Department of Fish and Wildlife and Western Washington Treaty Indian Tribes. 1998. Co-managers of Washington fish health policy. Fish Health Division, Hatcheries Program. Washington Dept. Fish and Wildlife, Olympia.

IHOT (Integrated Hatchery Operations Team). 1995. Operation plans for anadromous fish production facilities in the Columbia River basin. Volume III-Washington. Annual Report 1995. Bonneville Power Administration, Portland Or. Project Number 92-043. 536 pp.

Piper, R.G. et. al. 1982. Fish Hatchery Management. United States Department of the Interior, Fish and Wildlife Service, Washington D.C. 517 pp.

SECTION 14. CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY

□I hereby certify that the foregoing information is complete, true and correct to the best of my knowledge and belief. I understand that the information provided in this HGMP is submitted for the purpose of receiving limits from take prohibitions specified under the Endangered Species Act of 1973 (16 U.S.C.1531-1543) and regulations promulgated thereafter for the proposed hatchery program, and that any false statement may subject me to the criminal penalties of 18 U.S.C. 1001, or penalties provided under the Endangered Species Act of 1973.□

Name, Title, and Signature of Applicant:

Certified by _____ Date: _____

Appendix B

Table 1. Estimated listed salmonid take levels of by hatchery activity.

| Listed species affected: Chum ESU/Population: Lower Columbia Chum Activity: Hatchery Operations | | | | |
|---|---|----------------|-------|---------|
| Location of hatchery: Elochoman R. Hatchery Dates of activity: March - May Hatchery program operator: WDFW | | | | |
| Type of Take | Annual Take of Listed Fish By Life Stage (<i>Number of Fish</i>) | | | |
| | Egg/Fry | Juvenile/Smolt | Adult | Carcass |
| Observe or harass a) | | | | |
| Collect for transport b) | | | | |
| Capture, handle, and release c) | | | | |
| Capture, handle, tag/mark/tissue sample, and release d) | | | | |
| Removal (e.g. broodstock) e) | | | | |
| Intentional lethal take f) | | | | |
| Unintentional lethal take g) | | Unknown | | |
| Other Take (specify) h) | | | | |

a. Contact with listed fish through stream surveys, carcass and mark recovery projects, or migrational delay at weirs.

b. Take associated with weir or trapping operations where listed fish are captured and transported for release.

c. Take associated with weir or trapping operations where listed fish are captured, handled and released upstream or downstream.

d. Take occurring due to tagging and/or bio-sampling of fish collected through trapping operations prior to upstream or downstream release, or through carcass recovery programs.

e. Listed fish removed from the wild and collected for use as broodstock.

f. Intentional mortality of listed fish, usually as a result of spawning as broodstock.

g. Unintentional mortality of listed fish, including loss of fish during transport or holding prior to spawning or prior to release into the wild, or, for integrated programs, mortalities during incubation and rearing.

h. Other takes not identified above as a category.

Instructions:

1. An entry for a fish to be taken should be in the take category that describes the greatest impact.

2. Each take to be entered in the table should be in one take category only (there should not be more than one entry for the same sampling event).

3. If an individual fish is to be taken more than once on separate occasions, each take must be entered in the take table.

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Table 1. Estimated listed salmonid take levels of by hatchery activity.

| Listed species affected: Chinook ESU/Population: Lower Columbia Chinook Activity: Hatchery Operations | | | | |
|---|---|-----------------------|--------------|----------------|
| Location of hatchery: Elochoman R. Hatchery Dates of activity: March - May Hatchery program operator: WDFW | | | | |
| Type of Take | Annual Take of Listed Fish By Life Stage (<i>Number of Fish</i>) | | | |
| | Egg/Fry | Juvenile/Smolt | Adult | Carcass |
| Observe or harass a) | | | | |
| Collect for transport b) | | | | |
| Capture, handle, and release c) | | | | |
| Capture, handle, tag/mark/tissue sample, and release d) | | | | |
| Removal (e.g. broodstock) e) | | | | |
| Intentional lethal take f) | | | | |
| Unintentional lethal take g) | | Unknown | | |
| Other Take (specify h) | | | | |

- a. Contact with listed fish through stream surveys, carcass and mark recovery projects, or migrational delay at weirs.
- b. Take associated with weir or trapping operations where listed fish are captured and transported for release.
- c. Take associated with weir or trapping operations where listed fish are captured, handled and released upstream or downstream.
- d. Take occurring due to tagging and/or bio-sampling of fish collected through trapping operations prior to upstream or downstream release, or through carcass recovery programs.
- e. Listed fish removed from the wild and collected for use as broodstock.
- f. Intentional mortality of listed fish, usually as a result of spawning as broodstock.
- g. Unintentional mortality of listed fish, including loss of fish during transport or holding prior to spawning or prior to release into the wild, or, for integrated programs, mortalities during incubation and rearing.
- h. Other takes not identified above as a category.

Instructions:

1. An entry for a fish to be taken should be in the take category that describes the greatest impact.
2. Each take to be entered in the table should be in one take category only (there should not be more than one entry for the same sampling event).
3. If an individual fish is to be taken more than once on separate occasions, each take must be entered in the take table.