

# **PRE-REHABILITATION PLAN FOR SAGO, HOURGLASS, & WIDGEON LAKES, THE HAMPTON LAKE CHAIN, & PARAJUVENILE LAKE IN GRANT COUNTY, WASHINGTON**



Photo Credit: Michael Schmuck, WDFW

**Initiated by Chad Jackson, District 5 Fish Biologist  
Washington Department of Fish and Wildlife  
Fish Program/Management Division/Region 2  
Ephrata, WA**

## **I. PROPOSAL**

### **i. Background:**

Sago, Hourglass, and Widgeon Lakes, the Hampton Lake Chain, and Para-Juvenile Lake are a series of connected waters located within the Columbia National Wildlife Refuge (CNWR) just south of Potholes Reservoirs in Grant County. Sago, Hourglass, and Widgeon Lakes are actually part of a 10 water lake chain (Pillar-Widgeon). Historically, most of the Pillar-Widgeon lakes were surface water connected and eventually drained into Hampton Lake. Succession and sedimentation has isolated all but the lower three lakes (Sago, Hourglass, and Widgeon Lakes). The Hampton Lake Chain consists of Upper and Lower Hampton, the Hampton Slough Complex (Hampton Slough, Hen, Dabbler, and unnamed ponds), and Marie Lakes. Draining Upper and Lower Hampton Lakes to the west is Hen, Dabbler, and Marie Lakes. Draining Upper and Lower Hampton Lakes to the east include Hampton Slough and three unnamed small ponds that ultimately drain into Marie Lake. Marie Lake drains into Para-Juvenile Lake. On Hen and Marie Lakes are water control structures capable of significantly drawing down both waters and isolating them from Para-Juvenile Lake.

Upper and Lower Hampton Lakes are very popular opening day trout fisheries. Sago, Hourglass, and Widgeon Lakes are enjoyed by anglers who prefer hiking into trout waters and avoiding crowds. All of these waters are open seasonally from April 1<sup>st</sup> through September 30<sup>th</sup>. The Washington Department of Fish Wildlife (WDFW) annually stocks rainbow trout fingerlings (3-4 inches) during the spring at a rate of 200-300 fish per surface acre. By the following spring, trout measure 11-13 inches in length and make up the bulk of the catch by anglers. Past WDFW angler creel surveys indicate that 5,000-6,000 angler trips are spent at the Hampton Lakes annually when trout fishing is excellent. Between 10-15% of those trips occur on opening day.

WDFW does not manage the Hampton Slough Complex, Marie, or Para-Juvenile Lakes for trout. These waters are fairly shallow, weedy, and in general are not suitable for trout management. In certain years, these waters can offer fishing opportunities for warmwater fish species like bass and panfish.

### **ii. Justification:**

Lakes managed for rainbow trout offer the greatest fishing opportunity when maintained as monocultures free from competing, predatory, and/or nuisance fish

species (e.g., pumpkinseed sunfish, yellow perch, bullhead catfish, common carp, bass, etc.) that negatively impact their abundance and growth. WDFW keeps lakes free from competing, predatory, and/or nuisance fish species through periodic treatments using the aquatic pesticide rotenone. WDFW has treated lakes within the CNWR since the 1950s.

Angler success at Upper and Lower Hampton Lakes has been poor the past 5-6 years. Opening day angler creel survey results for the Hampton Lakes have averaged less than two trout harvested per angler. Target harvest rates for lakes like the Hamptons should be  $\geq 3.0$  trout per angler. Additionally, high abundances of pumpkinseed sunfish have been observed in Sago, Hourglass, Widgeon, and Upper and Lower Hampton Lakes with the possibility of other nuisance fish species present as well. The presence of pumpkinseed sunfish impacts the survival of stocked rainbow trout fingerlings. Pumpkinseed sunfish directly compete with rainbow trout fingerlings for the same food resources (i.e., zooplankton and aquatic insects). Rehabilitating these lakes will eradicate all nuisance fish species present and restore the trout fisheries.

**iii. Physical Description of Water(s) Proposed for Treatment:**

- a. **Water Name:** Sago Lake
- b. **Location:** T17N-R29E-S19&30
- c. **Size:** 1.5 SA
- d. **Average Depth:** 14.3 feet
- e. **Maximum Depth:** 35.0 feet
- f. **Water Volume:** 21.5 AF
- g. **Inlet Description:** Groundwater seepage originating from the east side of Sago Lake. Unknown and seasonally influenced quantity of water.
- h. **Outlet Description:** Sago Lake drains into Widgeon Lake at two different locations. The two outlets are short and wetland-like in nature.
- i. **Public Access:** Walk-in only. Access managed by CNWR staff.
- j. **Land Ownership:** 100% federal government ownership (USFWS).
- k. **Established Resorts:** None

- a. **Water Name:** Hourglass Lake
- b. **Location:** T17N-R29E-S30
- c. **Size:** 2.0 SA
- d. **Average Depth:** 11.3 feet
- e. **Maximum Depth:** 38.0 feet
- f. **Water Volume:** 22.6 AF
- g. **Inlet Description:** No inlet stream observed.
- h. **Outlet Description:** Permanent flow into Widgeon Lake, but not Sago Lake. Outlet approximately 20 yards in length and wetland-like in nature.
- i. **Public Access:** Walk-in only. Access managed by CNWR staff.
- j. **Land Ownership:** 100% federal government ownership (USFWS).

**k. Established Resorts:** None

**a. Water Name:** Widgeon Lake

**b. Location:** T17N-R29E-S30

**c. Size:** 10.8 SA

**d. Average Depth:** 14.2 feet

**e. Maximum Depth:** 38 feet

**f. Water Volume:** 153.4 AF

**g. Inlet Description:** Perennial flow from Hourglass and Sago Lakes. All three inlets are short and wetland-like in nature.

**h. Outlet Description:** Perennial flow into Upper Hampton Lake. Outlet is approximately 1/6 mile in length and  $\leq 3$  cfs of flow.

**i. Public Access:** Walk-in access only. Access managed by CNWR staff.

**j. Land Ownership:** 100% federal government ownership (USFWS).

**k. Established Resorts:** None

**a. Water Name:** Upper Hampton Lake

**b. Location:** T17N-R29E-S30

**c. Size:** 68.0 SA

**d. Average Depth:** 12.3 feet

**e. Maximum Depth:** 61.0 feet

**f. Water Volume:** 839.0 AF

**g. Inlet Description:** Perennial flow from Widgeon Lake and subterranean flow from Potholes Canal. Perennial inlet approximately 1/6 mile in length and  $\leq 3$  cfs.

**h. Outlet Description:** Perennial flow into Hen Lake and intermittent flow into Lower Hampton Lake. Perennial outlet approximately 200 yards in length and  $\leq 5$  cfs of flow. Intermittent outlet approximately 10 yards in length and  $\leq 1$  cfs of flow.

**i. Public Access:** Walk-in only. Access managed by CNWR staff.

**j. Land Ownership:** 100% federal government ownership (USFWS).

**k. Established Resorts:** None

**a. Water Name:** Lower Hampton Lake

**b. Location:** T17N-R29E-S30

**c. Surface Acres:** 20.0 SA

**d. Average Depth:** 23.6 feet

**e. Maximum Depth:** 46.0 feet

**f. Water Volume:** 472.0 AF

**g. Inlet Description:** Intermittent flow from Upper Hampton Lake. Intermittent outlet approximately 10 yards in length and  $\leq 1$  cfs of flow.

**h. Outlet Description:** Perennial flow into Hen Lake and seepage into the Hampton Slough Complex. The outlet from Lower Hampton Lake into Hen Lake cascades for approximate 10 yards at a "steep" gradient with  $\leq 3$  cfs of flow. This outlet is a potential upstream fish passage barrier. A culvert use to deliver surface flow between Lower Hampton Lake and the Hampton Slough Complex. However, this culvert is completely blocked and covered with sediment with the only water exchange between the two being seepage through the dike. As such, fish can no longer migrate from the Hampton Slough Complex into Lower Hampton Lake.

**i. Public Access:** Vehicle access at south end of lake. Access managed by CNWR staff.

- j. **Land Ownership:** 100% federal government ownership (USFWS).
- k. **Established Resorts:** None

- a. **Water Name:** Hampton Slough Complex (Hampton Slough, Hen Lake, Dabbler Lake, approximately three small unnamed ponds, and interconnected inlets/outlets)
- b. **Location:** T17N-R29E-S31
- c. **Surface Acres:** Approximately 15.0 SA
- d. **Average Depth:** Variable
- e. **Maximum Depth:** Variable
- f. **Water Volume:** Approximately 100.0 AF
- g. **Inlet Description:** Two inlets into the Hampton Slough Complex from Lower Hampton Lake. The first inlet is seepage through the dike between Lower Hampton Lake and Hampton Slough. A culvert use to deliver surface flow between Lower Hampton Lake and the Hampton Slough. This culvert is completely blocked and covered with sediment. As such, fish can no longer migrate from the Hampton Slough into Lower Hampton Lake. The second inlet is flow from Lower Hampton Lake into Hen Lake.
- h. **Outlet Description:** Two outlets with perennial flow (2-8 cfs) from the Hampton Slough Complex. The first inlet is flow (~2 cfs) from Hampton Slough and through two small (<1.0 SA) unnamed ponds into Marie Lake. The second inlet is flow (~8 cfs) from Hen Lake through a drop culver structure into a small unnamed pond, Dabbler Lake, and then Marie Lake.
- i. **Public Access:** Walk-in only. Access managed by CNWR staff.
- j. **Land Ownership:** 100% federal government ownership (USFWS).
- k. **Established Resorts:** None

- a. **Water Name:** Marie Lake
- b. **Location:** T17N-R29E-S31
- c. **Surface Acres (Estimated after ~6.0 feet lake drawdown):** 3.0 SA
- d. **Average Depth:** No Data
- e. **Maximum Depth:** 8.0 feet
- f. **Water Volume:** 24.0 AF
- g. **Inlet Description:** Two inlets with perennial flow from the Hampton Slough Complex (see above).
- h. **Outlet Description:** Normally, perennial flow (~11 cfs) into Para-Juvenile Lakes, however, with lake drawdown there would be none until detoxification and refill.
- i. **Public Access:** Walk-in only. Access managed by CNWR staff.
- j. **Land Ownership:** 100% federal government ownership (USFWS).
- k. **Established Resorts:** None

- a. **Water Name:** Para-Juvenile Lake
- b. **Location:** T17N-R29E-S31
- c. **Surface Acres:** 12.0 SA
- d. **Average Depth:** 10.0 feet
- e. **Maximum Depth:** 10.0 feet
- f. **Water Volume:** 61.7 AF
- g. **Inlet Description:** Marie Lake drains into Para-Juvenile Lake at the north end. Water cascades down a steep basalt channel. The quantity of water flowing from Marie Lake into Para-Juvenile Lake varies during the year and can range from a ~10 cfs to zero flow. Marie Lake has a water control structure at its outlet that controls outflow.

- h. **Outlet Description:** Normally, perennial flow (~11 cfs) into Para-Juvenile Lakes, however, with lake drawdown there would be none until detoxification and refill.
- i. **Public Access:** Walk-in only. Access managed by CNWR staff.
- j. **Land Ownership:** 100% federal government ownership (USFWS).
- k. **Established Resorts:** None

**iv. Proposed Fish Management Action(s):**

- a. **Water Name:** Sago Lake
- b. **Target Species:** Pumpkinseed sunfish
- c. **Date Last Rehabilitated:** 2004
- d. **Proposed Treatment Date:** October 2014
- e. **Replanting Date:** March-June 2015
- f. **Species:** Rainbow Trout
- g. **Size(s):** ≤100 fpp
- h. **Proposed Planting Rate:** 200 fish/SA
- i. **Proposed Toxicant:** CFT Legumine liquid rotenone
- j. **Amount of Rotenone (5% Active Ingredient):** ≤204.7 pounds powdered and ≤3.5 gallons of liquid rotenone-OR-≤28.3 gallons of liquid rotenone if pumper boats cannot access the lake.
- k. **Method of Application:** Slurry and/or spray (Pumper boat, helicopter, and/or portable sprayer (canoe, ATC, etc.))

- a. **Water Name:** Hourglass Lake
- b. **Target Species:** Pumpkinseed sunfish
- c. **Date Last Rehabilitated:** 2004
- d. **Proposed Treatment Date:** October 2014
- e. **Replanting Date:** March-June 2015
- f. **Species:** Rainbow Trout
- g. **Size(s):** ≤100 fpp
- h. **Proposed Planting Rate:** 200 fish/SA
- i. **Proposed Toxicant:** CFT Legumine liquid rotenone
- j. **Amount of Rotenone (5% Active Ingredient):** ≤215.2 pounds of powdered and ≤3.7 gallons of liquid rotenone-OR-≤29.8 gallons of liquid rotenone if pumper boats cannot access the lake.
- k. **Method of Application:** Slurry and/or spray (Pumper boat, helicopter, and/or portable sprayer (canoe, ATC, etc.))

- a. **Water Name:** Widgeon Lake
- b. **Target Species:** Pumpkinseed sunfish
- c. **Date Last Rehabilitated:** 2004
- d. **Proposed Treatment Date:** October 2014
- e. **Replanting Date:** March-June 2015
- f. **Species:** Rainbow Trout
- g. **Size(s):** ≤100 fpp
- h. **Proposed Planting Rate:** 200 fish/SA
- i. **Proposed Toxicant:** CFT Legumine liquid rotenone

- j. Amount of Rotenone (5% Active Ingredient):**  $\leq 1,460.4$  pounds of powdered and  $\leq 25.3$  gallons of liquid rotenone-OR- $\leq 202.4$  gallons of liquid rotenone if pumper boats cannot access the lake
  - k. Method of Application:** Slurry and/or spray (Pumper boat, helicopter, and/or portable sprayer (canoe, ATC, etc.)); Outlet (ATV or backpack sprayer)
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- a. Water Name:** Upper Hampton Lake and Inlet
  - b. Target Species:** Pumpkinseed sunfish
  - c. Date Last Rehabilitated:** 2004
  - d. Proposed Treatment Date:** October 2014
  - e. Replanting Date:** March-June 2015
  - f. Species:** Rainbow Trout
  - g. Size(s):**  $\leq 100$  fpp
  - h. Proposed Planting Rate:** 300 fish/SA
  - i. Proposed Toxicant:** Cube Root powdered and CFT Legumine liquid rotenone
  - j. Amount of Rotenone (5% Active Ingredient):**  $\leq 7,987.3$  pounds of powder and  $\leq 138.4$  gallons of liquid
  - k. Method of Application:** Slurry (powdered) and spray (liquid)
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- a. Water Name:** Lower Hampton Lake
  - b. Target Species:** Pumpkinseed sunfish
  - c. Date Last Rehabilitated:** 2004
  - d. Proposed Treatment Date:** October 2014
  - e. Replanting Date:** March-June 2015
  - f. Species:** Rainbow Trout
  - g. Size(s):**  $\leq 100$  fpp
  - h. Proposed Replanting Rate:** 300 fish/SA
  - i. Proposed Toxicant:** Cube Root powdered and CFT Legumine liquid rotenone
  - j. Amount of Rotenone (5% Active Ingredient):**  $\leq 4,493.4$  pounds of powder and  $\leq 77.9$  gallons of liquid
  - k. Method of Application:** Pumper boat-Slurry (powdered) and spray (liquid)
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- a. Water Name:** Hampton Slough Complex (Hampton Slough, Hen Lake, Dabblers Lake, approximately three small unnamed ponds, and interconnected inlets/outlets)
  - b. Target Species:** Pumpkinseed sunfish
  - c. Date Last Rehabilitated:** 2004
  - d. Proposed Treatment Date:** October 2014
  - e. Replanting Date:** N/A
  - f. Species:** N/A
  - g. Size(s):** N/A
  - h. Proposed Replanting Rate:** N/A
  - i. Proposed Toxicant:** Cube Root powdered and CFT Legumine liquid rotenone
  - j. Amount of Rotenone (5% Active Ingredient):** N/A (This system will serve as a receiving and detoxification basin as treated water flows from Sago, Hourglass, Widgeon, and U/L Hampton Lakes)
  - k. Method of Application:** Direct drainage
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- a. Water Name:** Marie Lake
  - b. Target Species:** N/A

- c. **Date Last Rehabilitated:** 2004
  - d. **Proposed Treatment Date:** October 2014
  - e. **Replanting Date:** N/A
  - f. **Species:** N/A
  - g. **Sizes:** N/A
  - h. **Proposed Planting Rate:** N/A
  - i. **Proposed Toxicant:** N/A
  - j. **Amount of Rotenone (5% Active Ingredient):** N/A (This lake will serve as a receiving and detoxification basin as treated water flows from Sago, Hourglass, Widgeon, U/L Hampton Lakes, and Hampton Slough Complex.)
  - k. **Method of Application:** Direct drainage
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- l. **Water Name:** Para-Juvenile Lake
  - m. **Target Species:** Pumpkinseed sunfish
  - n. **Date Last Rehabilitated:** 1998
  - o. **Proposed Treatment Date:** October 2014
  - p. **Replanting Date:** N/A
  - q. **Species:** N/A
  - r. **Sizes:** N/A
  - s. **Proposed Replanting Rate:** N/A
  - t. **Proposed Toxicant:** Cube Root powdered and CFT Legumine liquid rotenone
  - u. **Amount of Rotenone (5% Active Ingredient):** None (This lake will serve as a backup receiving and detoxification basin if any treated water, none expected, trickles out of Marie Lake. Marie Lake will be drawn down by 6-8 feet which is expected to completely eliminate any outflow. However, a small “trickle” that amounts to fractions of a cfs could leak from Marie Lake potentially sending minute amounts of treated water into Para-Juvenile Lake.)
  - v. **Method of Application:** Direct drainage
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- v. **Proposed Maximum Concentration and Total Amount of Toxicant Used:**
    - a. **Sago Lake, Hourglass, and Widgeon Lakes:**
      - i. Option 1 (All three lakes treated with powder and liquid):  $\leq 4.0$  ppm and  $\leq 1,880$  pounds of powdered and  $\leq 32.5$  gallons of liquid rotenone.
      - ii. Option 2 (Widgeon treated with powder and liquid; Sago and Hourglass treated with liquid):  $\leq 4.0$  ppm and  $\leq 1,460.4$  pounds of powdered and  $\leq 83.5$  gallons of liquid rotenone.
      - iii. Option 3 (All three lakes treated with liquid):  $\leq 4.0$  ppm and  $\leq 260.5$  gallons of liquid rotenone.
    - b. **U/L Hampton Lakes:**  $\leq 4.0$  ppm and 12,483.7 pounds of powdered and  $\leq 216.3$  gallons (includes Upper Hampton Lake inlet) of liquid rotenone.
    - c. **Hampton Slough Complex:** N/A (Not directly treated. Receiving and detoxification basins only.)
    - d. **Marie Lake:** N/A (Not directly treated. Receiving and detoxification basins only.)
    - e. **Para-Juvenile:** N/A (Not directly treated. Backup receiving and detoxification basins if a small “trickle” flows from Marie Lake.)

**vi. Crew Description:**

A work crew of approximately 12-15 staff will be required to complete Sago, Hourglass, Widgeon, and U/L Hampton Lakes rehabilitations within one week. Specifically, the District 5 Fish Biologist (Chad Jackson) will act as the project lead overseeing all aspects of the treatment. Chad Jackson possesses a valid Washington pesticide application license. Other WDFW staff possess valid pesticide application licenses and will assist the project lead with certain aspects of the treatment.

**II. INTENDED OUTCOME AND MEASURE(S) OF SUCCESS**

The intended outcome of the rehabilitation is to completely eradicate nuisance fish species present and restore the quality rainbow trout fisheries in the waters identified above. Treatment success will be measured primarily through angler success during opening day creel surveys. Trout harvest rates should average  $\geq 3.0$  fish per angler on opening day. Additionally, periodic fish community surveys using electrofishing and gillnetting will be used to determine the percent kill of nuisance fish species and/or their reestablishment in any of the treated waters identified above.

**III. NATURAL RESOURCE IMPACTS**

Impacts to natural resources at treated lakes include the eradication of targeted nuisance fish species and any remaining rainbow trout. There are no native or endemic fish species concerns for these waters because most of them were artificially created through irrigation seepage and thus originally fishless. Varying levels of mortality will be suffered by other aquatic biota including phytoplankton, zooplankton, and benthos (e.g., insects, crayfish, snails, clams, etc.). However, according to the literature these species recover to at least pre-treatment levels and in several cases recovery exceeds pre-treatment levels. Recover of these species is so immediate because a 100% kill is never achieved, abundances of some species (e.g., phytoplankton and zooplankton) is normally low during the fall, the eggs of some species are already deposited in the sediment and are not affected by rotenone, and/or they reside in the sediment that naturally detoxifies rotenone. Additionally, amphibians that metamorphose during the fall and/or species that overwinter with gills could be impacted during treatment. The most common amphibian species within the CNWR and surrounding area impacted by lake rehabilitations is the non-native bullfrog.

**IV. RECREATIONAL IMPACTS**

Recreational fishing in Sago, Hourglass, Widgeon, and Upper/Lower Hampton Lakes will be severely impacted because there will be no yearling size rainbow trout (11-13 inches) present for anglers on opening day 2015. Normally, WDFW stocks rehabilitated lakes with catchable-size (11-13 inches) rainbow trout the following spring to ensure there is no interruption in angling opportunity. As mentioned above, all of these waters proposed for rehabilitation are located within a national wildlife refuge. USFWS national wildlife refuge policy states that catchable-size sport fish cannot be stocked into refuge waters for the sole purpose of creating and/or maintaining recreational fisheries. As such, fishing in 2015 will be postponed to allow rainbow trout fingerlings time to grow to catchable size. Recreational fishing will resume in 2016.

## **V. ECONOMIC IMPACTS**

Potential economic impacts to local economies are possible when Sago, Hourglass, Widgeon, and Upper/Lower Hampton Lakes are unfishable in 2015 (see Section IV above). The degree of impact to local economies is unknown. However, from 2016 and throughout the lifespan (6-10 years) of the rehabilitation, these lakes should provide excellent fishing for trout. This increase in fishing quality should increase angler participation that in turn provides a boost to local economies.

## **VI. MITIGATION FOR ADVERSE IMPACTS**

Since catchable rainbow trout cannot be stocked into CNWR lakes, the only mitigation WDFW will engage in is to alert recreational anglers Sago, Hourglass, Widgeon, and Upper/Lower Hampton Lakes will not be fishable in 2015. Through various media outlets, WDFW will alert anglers that these lakes will not be fishable in 2015.

## **VII. OTHER RELATED FISH MANAGEMENT ACTION(S)**

At this time no other fish management related action(s) will be undertaken by WDFW.

## **VIII. PUBLIC NOTIFICATION**

WDFW will hold public meetings at the Region 2 Office in Ephrata and at the Natural Resources Building in Olympia in July (exact dates TBD). The purpose of these meetings is to alert the general public of the proposed treatments, collect public comments, and assess public opinion of the proposed project. Notice of the public meeting will be made through a WDFW press release and ads in pertinent local newspapers.

Additionally, all adjacent landowners within ¼ mile of the project will receive two notification letters about the proposed treatments. During treatment and until the lakes detoxify, WDFW will sign all points of access alerting the public about the treatment.

In early 2014, WDFW will alert recreational anglers through various media outlets that Sago, Hourglass, Widgeon, and Upper/Lower Hampton Lakes will be unfishable in 2015.