

**2023 PRE-REHABILITATION PLAN for June, North-North Windmill, and  
North Windmill Lakes, Grant County, Washington**



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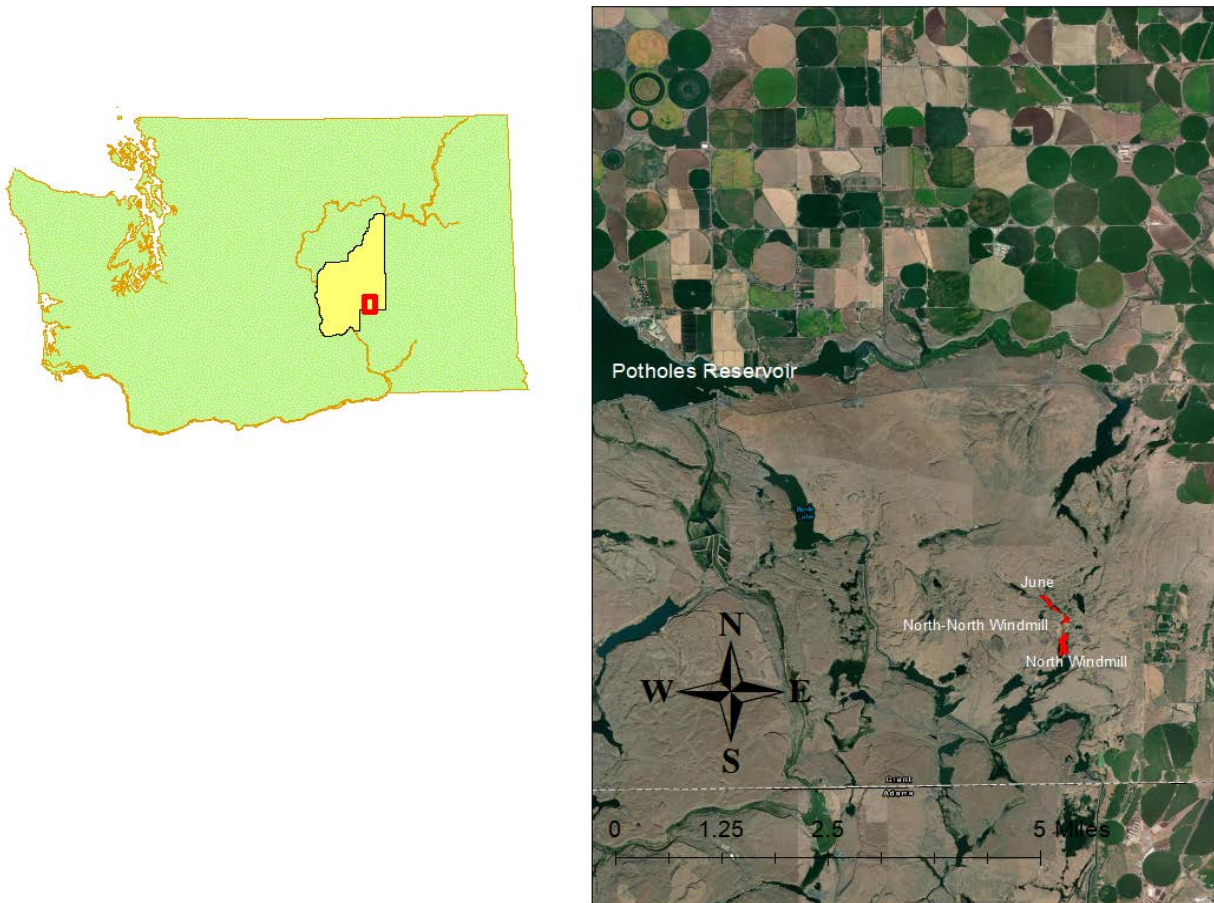
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## 1.0 INTRODUCTION

The June, North-North Windmill, and North Windmill chain of lakes lie approximately 5 miles southeast of O'Sullivan Dam and Potholes Reservoir in southeastern Grant County, Washington (Figure 1). These lakes have been popular trout fisheries since the 1950s, ranging from 4–10 fish caught per angler when opening day-type seasons were in effect (WDFW unpublished data). The lakes are open to fishing year-round, reducing the opening day crowds in favor of prolonged and steady angling pressure. Populations of Largemouth Bass *Micropterus salmoides*, Pumpkinseed *Lepomis gibbosus*, and Bluegill *Lepomis macrochirus* in these lakes are reducing survival of stocked Rainbow Trout *Oncorhynchus mykiss* fingerlings through competition and predation. Consequently, these lakes do not attract anglers due to the small average size of the sunfish in these unbalanced fish communities and the low abundance of Rainbow Trout.



**Figure 1.** Map of June, North-North Windmill, and North Windmill lakes located in southern Grant County, WA.

These lakes were treated with piscicides in 1975, 1990, 1997, and 2010. The earliest rehabilitations targeted illegally introduced Black Crappie *Pomoxis nigromaculatus*, although Yellow Perch *Perca flavescens*, Pumpkinseed, bullheads *Ameiurus spp.*, and Common Carp *Cyprinus carpio* have also been targeted in the past. Pumpkinseed appeared in all these waters in the early 1980's and the last three chemical rehabilitations have failed to eradicate them.

Lake rehabilitations provide quality trout fishing for 7–12 years. Once undesirable fish species establish or rebound trout fishing diminishes and fewer anglers fish these lakes over time. Alternatives to rehabilitation are costly or impractical. Stocking catchable sized Rainbow Trout costs almost ten times as much as stocking fingerlings. Mechanical removal of nuisance species, either by using gill nets or electrofishing requires a tremendous amount of effort on an annual basis and offers only limited benefits since these efforts only remove a portion of the population being targeted. Liberalizing bag limits on nuisance species has little impact on these populations since these populations are often dominated by small fish, which are not often harvested by anglers. Optimistic estimates of survival of 4–5 inch fingerlings in larger mixed species waters range from 10–20%. Spring fingerling Rainbow Trout survival in lakes free of competing species ranges from 50–80%. It has been 13 years since the last treatment of these lakes, and angler effort has declined significantly, while surrounding waters free from competing species continue to attract anglers throughout the year.

## 2.0 PHYSICAL DESCRIPTION OF THE WATERS PROPOSED FOR TREATMENT

- a. **Water Name:** June Lake
- b. **Location:** Grant County, T17N, R29E, Sec 21,22. Center of lake at: 46.945644 - 119.176550
- c. **Size:** 10.8 Surface Acres
- d. **Average Depth:** 14.4 feet
- e. **Water Volume:** 156 acre-feet
- f. **Inlet Stream:** Subterranean flow.
- g. **Outlet Stream:** Perennial, small creek (200 ft., 2-3 cfs) drains to N.N. Windmill Lake.
- h. **Public Access:** Entire Lake, walk in only, no facilities.
- i. **Land Ownership:** Bureau of Reclamation
- j. **Established Resorts:** None

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- a. **Water Name:** North-North Windmill Lake
  - b. **Location:** Grant County, T17N, R29E, Sec 22. Center of lake at: 46.942192 -119.172026
  - c. **Size:** 3.8 Surface Acres
  - d. **Average Depth:** 11.6 feet
  - e. **Water Volume:** 44 acre-feet
  - f. **Inlet Stream:** Perennial, small creek from June Lake and perennial, small creek from Virgin Lake.
  - g. **Outlet Stream:** Perennial, small creek (600 ft., 2-3 cfs) drains to N. Windmill Lake.
  - h. **Public Access:** Entire Lake, walk in only, no facilities.
  - i. **Land Ownership:** Bureau of Reclamation
  - j. **Established Resorts:** None

- a. **Water Name:** North Windmill Lake
  - b. **Location:** Grant County, T17N, R29E, Sec 27. Center of lake at: 46.937121 -119.173059
  - c. **Size:** 20.2 Surface Acres
  - d. **Average Depth:** 16.8 feet
  - e. **Water Volume:** 341 acre-feet
  - f. **Inlet Stream:** Perennial, small creek from North North Windmill.
  - g. **Outlet Stream:** Ephemeral ~1cfs (primarily during spring) seepage partially blocked by beaver dam spanning across channel, then flows approximately 30 feet to a small (30ft.) waterfall into Windmill Lake.
  - h. **Public Access:** Bureau of Reclamation
  - i. **Land Ownership:** Private, Hampton Ranch LLC, walk-in public fishing access allowed via agreement with WDFW.
  - j. **Established Resorts:** None
- 

- a. **Water Name:** Windmill Lake
  - b. **Location:** Grant County, T17N, R29E, Sec 27. Center of lake at: 46.932727 -119.174138
  - c. **Size:** 37.4 Surface Acres
  - d. **Average Depth:** 28.7 feet
  - e. **Water Volume:** 1,073.7 acre-feet
  - f. **Inlet Stream:** Ephemeral ~1cfs (primarily during spring), small (30 ft.) waterfall from North Windmill.
  - g. **Outlet Stream:** Channelized perennial connection to Canal Lake.
  - h. **Public Access:** Bureau of Reclamation
  - i. **Land Ownership:** Private, Hampton Ranch LLC, walk-in public fishing access allowed via agreement with WDFW and Bureau of Reclamation.
  - j. **Established Resorts:** None
- 

- a. **Water Name:** Canal Lake
- b. **Location:** Grant County, T17N, R29E, Sec 33. Center of lake at: 46.92501, -119.18504
- c. **Size:** 92.2 Surface Acres
- d. **Average Depth:** 21.3 feet
- e. **Water Volume:** 1,960 acre-feet
- f. **Inlet Stream:** Perennial surface water connection Windmill Lake.
- g. **Outlet Stream:** None. No surface water connection downstream.
- h. **Public Access:** Bureau of Reclamation
- i. **Land Ownership:** Bureau of Reclamation.
- j. **Established Resorts:** None

### 3.0 PROPOSED FISH MANAGEMENT ACTION

- a. **Water Name:** June Lake
  - b. **Target Species:** Pumpkinseed and Bluegill
  - c. **Date Last Rehabilitated:** Oct. 16, 2010
  - d. **Proposed Treatment Date:** Oct. 9–13, 2023
  - e. **Toxicant:** Rotenone Powder Fish Toxicant (powder formulation; EPA Reg. #89459-32); CFT Legumine Fish Toxicant (liquid formulation; EPA Reg. #655-899) and Prentox Prenfish Fish Toxicant (liquid formulation; EPA Reg. #655-422)
  - f. **Method of Application:** Semi-closed, boat mounted, aspirator system (powder) and a semi-closed probe system (liquid). (Finlayson et al. 2018)
  - g. **Toxicant Concentration (ppb):** up to 200.
  - h. **Toxicant Amount:**
    - a. **POWDER:** 1,656 lbs. Rotenone Fish Toxicant (powder formulation; EPA Reg. #89459-32) at 5% A.I.
    - b. **LIQUID:** 5 gallons CFT Legumine Fish Toxicant (liquid formulation; EPA Reg. #655-899) at 5% A.I. or 5 gallons Prentox Prenfish Fish Toxicant (liquid formulation; EPA Reg. #655-422) at 5% A.I.
  - i. **Crew Description:** Leader(s) Mike Schmuck + 3-5 crew
  - j. **Restocking Date:** Spring 2024
  - k. **Species:** Rainbow Trout
  - l. **Catchables:** 200
  - m. **Fingerlings:** 3,000
- 

- a. **Water Name:** North-North Windmill Lake
- b. **Target Species:** Pumpkinseed and Bluegill
- c. **Date Last Rehabbed:** Oct. 16, 2010
- d. **Proposed Treatment Date:** Oct. 9–13, 2023
- e. **Toxicant:** Rotenone Powder Fish Toxicant (powder formulation; EPA Reg. #89459-32); CFT Legumine Fish Toxicant (liquid formulation; EPA Reg. #655-899) and Prentox Prenfish Fish Toxicant (liquid formulation; EPA Reg. #655-422)
- f. **Method of Application:** Slurry (powder) and Spray (liquid)
- g. **Toxicant Concentration (ppb):** up to 200.
- h. **Toxicant Amount:**
  - a. **POWDER:** 458 lbs. Rotenone Fish Toxicant (powder formulation; EPA Reg. #89459-32) at 5% A.I.
  - b. **LIQUID:** 3 gallons CFT Legumine Fish Toxicant (liquid formulation; EPA Reg. #655-899) at 5% A.I. or 3 gallons Prentox Prenfish Fish Toxicant (liquid formulation; EPA Reg. #655-422) at 5% A.I.
- i. **Crew Description:** Leader(s) Mike Schmuck + 3-5 crew
- j. **Restocking Date:** Spring 2024
- k. **Species:** Rainbow Trout
- l. **Catchables:** 100
- m. **Fingerlings:** 1,140

- a. **Water Name:** North Windmill Lake
  - b. **Target Species:** Pumpkinseed, Bluegill and Largemouth Bass
  - c. **Date Last Rehabbed:** Oct. 16, 2010
  - d. **Proposed Treatment Date:** Oct. 9–13, 2023
  - e. **Toxicant:** Rotenone Powder Fish Toxicant (powder formulation; EPA Reg. #89459-32); CFT Legumine Fish Toxicant (liquid formulation; EPA Reg. #655-899) and Prentox Prenfish Fish Toxicant (liquid formulation; EPA Reg. #655-422)
  - f. **Method of Application:** Slurry (powder) and Spray (liquid)
  - g. **Toxicant Concentration (ppb):** up to 200.
  - h. **Toxicant Amount:**
    - a. **POWDER:** 3,634 lbs. Rotenone Fish Toxicant (powder formulation; EPA Reg. #89459-32) at 5% A.I.
    - b. **LIQUID:** 10 gallons CFT Legumine Fish Toxicant (liquid formulation; EPA Reg. #655-899) at 5% A.I. or 10 gallons Prentox Prenfish Fish Toxicant (liquid formulation; EPA Reg. #655-422) at 5% A.I.
  - i. **Crew Description:** Leader(s) Mike Schmuck + 3-5 crew
  - j. **Restocking Date:** Spring 2024
  - k. **Species:** Rainbow Trout
  - l. **Catchables:** 100
  - m. **Fingerlings:** 1,140
- 

- a. **Water Name:** Windmill Lake
- b. **Target Species:** NA
- c. **Date Last Rehabbed:** Oct. 16, 2010
- d. **Proposed Treatment Date:** Oct. 9–13, 2023.
- e. **Toxicant:** NA
- f. **Method of Application:** Natural flow of treated water from North Windmill Lake
- g. **Toxicant Concentration (ppb):** Windmill Lake will not be physically treated but may act as a receiving and detoxification basin. Windmill Lake may receive treated water from North Windmill Lake if a surface connection exists at the time of treatment. Any treated water that enters Windmill Lake will detoxify quickly and not adversely affect the fish community.
- h. **Toxicant Amount:** No toxicant will be applied to Windmill Lake directly.
- i. **Crew Description:** NA
- j. **Restocking Date:** NA
- k. **Species:** NA
- l. **Catchables:** NA
- m. **Fingerlings:** NA

- a. **Water Name:** Canal Lake
- b. **Target Species:** NA
- c. **Date Last Rehabbed:** Oct. 16, 2010
- d. **Proposed Treatment Date:** Oct. 9–13, 2023
- e. **Toxicant:** NA
- f. **Method of Application:** Natural flow of treated water from North Windmill
- g. **Toxicant Concentration (ppb):** Canal Lake will not be physically treated but may act as a receiving and detoxification basin. Canal Lake may receive treated water from Windmill Lake. Any treated water that enters Canal Lake will detoxify quickly and not adversely affect the fish community.
- h. **Toxicant Amount:** No toxicant will be applied to Canal Lake directly.
- i. **Crew Description:** NA
- j. **Restocking Date:** NA
- k. **Species:** NA
- l. **Catchables:** NA
- m. **Fingerlings:** NA

#### 4.0 PURPOSE

The Washington Department of Fish and Wildlife (WDFW) provides many types of fisheries in response to public desires. Public demand for and participation in trout fisheries is very high, since these fisheries are prized as opportunities for families to recreate together as well as providing an appropriate challenge for occasional or novice anglers. Year around trout fisheries provide a relaxed recreational opportunity and are also integral to the state and many local economies.

June, North-North Windmill, and North Windmill Lakes have a long history of being managed as trout fisheries. We intend to return these lakes to trout fisheries consistent with Management Plans established over 20 years ago. Only the complete rehabilitation or the stocking of catchable-sized fish can restore the trout fishery in these waters. Rehabilitation will eliminate or significantly reduce undesirable fish species and allow the trout fisheries to flourish. The cost of annually stocking catchable-sized trout and creating a mixed species fishery would be significantly greater for the larger trout necessary to attract anglers. Without a very significant capital investment, current resources are not available to provide catchable-sized trout on a regular basis without severely impacting hatchery production for many other fisheries. Managing these waters as warmwater fisheries will not create the same amount of recreation, as evidenced by the decline in participation as these trout fisheries ebb.

#### 5.0 DESCRIPTION OF FISH SPECIES TO BE ERADICATED AND HOW DMP ACTION THRESHOLDS ARE MET

The fish species targeted for eradication are Pumpkinseed, Bluegill, and Largemouth Bass (see section 3). The Discharge Management Plan for the State of Washington Department of Ecology (DOE) Fishery Resource Management General National Pollutant Discharge Elimination System (NPDES) Permit No. 0041009 stipulates (Section B, subsection 2, item a and Section C, subsection 1, item a) that demonstrated poor survival of trout and increasing numbers (and high relative



abundance) of panfish and/or predatory fish are each threshold that justify lake rehabilitation (Bolding et al. 2015). Trout survival rates are currently poor and Pumpkinseed, Bluegill, and Largemouth Bass are increasingly abundant (WDFW unpublished data).

## **6.0 INTENDED OUTCOME AND MEASURE(S) OF SUCCESS**

The intended outcome of the rehabilitation is to eradicate or nearly eradicate all undesirable fish species present and restore the quality Rainbow Trout fisheries in June, North-North Windmill, and North Windmill Lakes. Treatment success will be measured primarily through angler success during creel surveys. Catch rates should average 2.5 fish harvested per angler when lakes are free from competing species and fingerling survival is not impacted by intra-specific competition. Additionally, periodic fish community surveys using gill nets will be used to determine the percent kill of undesirable fish species and/or their reestablishment in any of the treated waters listed above. As a result of the improved trout fisheries in these waters, we expect angler-days to increase, which will result in a substantial economic boost to surrounding communities.

## **7.0 NATURAL RESOURCE IMPACTS**

Impacts to natural resources in treated waters include the eradication or near eradication of targeted undesirable fish species and any remaining rainbow trout. 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. Recovery of these species is immediate because a 100% kill is rarely, if ever, achieved, abundances of certain species (e.g., phytoplankton and zooplankton) is naturally low during the fall, the eggs of some species are already deposited in the sediment and are not affected by rotenone, and/or the organisms that reside in the sediment that naturally detoxify rotenone. Amphibians that have not metamorphosed during the fall and/or species and overwinter with gills could be impacted during treatment. The most common amphibian species in the surrounding area impacted by lake rehabilitations is the non-native bullfrog.

## **8.0 RECREATIONAL IMPACTS**

June, North-North Windmill, and North Windmill are open year-round to fishing; therefore, the fall and winter fisheries on these lakes in 2023-24 will be lost. Fortunately, there are numerous lakes managed for year-round trout fishing nearby that will help mitigate against lost opportunities. The WDFW will stock each lake with catchable-size (11–13 inch) Rainbow Trout in spring 2024 to ensure angling opportunity is minimally impacted. In addition, WDFW will resume planting fingerling Rainbow Trout into all three lakes in spring 2024 to provide future fishing opportunities in the most economical and efficient manner.

## **9.0 ECONOMIC IMPACTS**

An estimated 1,000 trips made to these lakes because of the proposed management action would result in an increased economic impact totaling \$36,000 per year (2016 dollars; based on a USFWS estimate of \$36.00 per trip). If used to its full potential, the annual value could be over

\$200,000 to the state's economy. The fishery as it now exists generates perhaps only \$5,000 per year. Chemical rehabilitation would restore these fisheries and associated economic activity. The total annual costs to plant these lakes with fingerling Rainbow Trout is less than \$3,500. The rehabilitation will cost WDFW about \$45,000 (including costs of rotenone, time, travel). The investment will be realized within the first two years after treatment. In addition, over the life of this rehabilitation, which could range from 7–15 years, the economic benefit to surrounding communities could reach over a half-million dollars.

## **10.0 MITIGATION FOR ADVERSE IMPACTS**

No loss of recreational fishing will occur in 2024 for June, North-North Windmill and North Windmill Lakes. Catchable size (10–13 inches) Rainbow Trout will be stocked in early spring 2024. This will be followed up with the stocking of fingerling Rainbow Trout later in spring 2024. Trout fingerling survival and growth will be greatly enhanced, and future trout fisheries will attain their previous status. No removal of dead fish is planned as the nutrient base contained therein is best returned to the lake. Livestock use of the waters to be treated will not be significantly affected. The concentration of rotenone used in the treatment will be far below that considered harmful to mammals. Landowners will be notified of the rehabilitation and consequent exposure of livestock to rotenone.

Fall rehabilitation will not interfere with waterfowl spring nesting. The eradication of spiny-ray fishes would also benefit waterfowl through increased production of invertebrates. Stocked populations of trout will not be anywhere near as numerous as the current spiny-ray population.

No endemic, rare, threatened or otherwise listed species are known to inhabit this area.

## **11.0 RELATED MANAGEMENT ACTION:**

See section 3.0 (PROPOSED FISH MANAGEMENT ACTIONS) for fish stocking information.

Increased penalties and enforcement activities are desirable if WDFW is ever going to dissuade illegal stocking of state managed waters. Educating the public about the costs in Department dollars and time with emphasis on what WDFW might be able to accomplish with those resources would be a very worthwhile activity for O & E. This may result in stemming recruitment to this ill-advised group and turning local opinion against the offenders.

## **12.0 PUBLIC CONTACT:**

A public hearing will be held in July 2023 (date and time TBD) to explain Region 2's rehabilitation proposals, assess public opinion, and address local concerns. The announcement will be provided to area papers and radio stations at least a week in advance of the meeting. With many of the lake's users living outside Grant County, actual percentages pro and con are difficult to obtain. Public support may be best judged by the number of participants in the fishery (vis a vis Recreational Impacts).

### 13.0 PRE-TREATMENT ANALYTICAL METHODS USED FOR MONITORING

The following pre-treatment monitoring is required by DOE (2015).

#### 13.1 Water Chemistry

WDFW must collect pre-treatment measurements of water chemistry, including water temperature, dissolved oxygen, and pH, at a representative location in the treatment water within 24 hours prior to treatment. Pre-treatment water chemistry data will be collected using a YSI multimeter.

#### 13.2 Volatile Organic Compounds (VOC)

If potable water rights/withdrawals are present in the treatment water AND liquid rotenone is applied, WDFW must collect a water sample to test for background levels of VOCs. These samples must be sent to an accredited environmental laboratory within 48 hours for processing. VOC detection levels must be  $\leq 0.5$  ppb.

### 14.0 POST-TREATMENT ANALYTICAL METHODS USED FOR MONITORING

The following post-treatment monitoring is required by DOE (2015).

#### 14.1 Water Chemistry

WDFW must collect post-treatment measurements of water chemistry, including water temperature, dissolved oxygen, and pH, at a representative location within 24 hours following treatment. Post-treatment water chemistry data will be collected using methods described in section 13.0.

#### 14.2 Trout Toxicity Bioassay

Beginning 24 hours following rotenone application, again at 7 days following the treatment, and continuing weekly thereafter until all fish survive 48 consecutive hours, caged sentinel fish (Rainbow Trout fingerlings) will be placed in the treated waterbody and monitored for survival. Five sentinel fish will be placed in a cage at each bioassay location, with the number of locations based on whether potable water rights are present for the treated waterbody. If no potable rights are present, a single bioassay is required. If potable rights are present, then bioassay must occur at 3 locations representative of the potable withdrawals or at the number of locations equal to 20% of the number of potable water rights, whichever number is greater.

#### 14.3 Water Withdrawals

##### 1. Potable Water Rights

Potable water withdrawals from the treated water body must cease prior to treatment and cannot resume until ***BOTH*** following conditions are met:

- **Rotenone concentration**

Potable water withdrawals from the treatment water may resume only after rotenone concentration in the treated waterbody falls below 40 ppb (active ingredient). Rotenone concentrations must be analyzed by methods listed in SOP 16 of the Rotenone SOP manual (Finlayson et al. 2018), which includes bioassay with salmonids. Bioassay must be conducted in

locations representative of potable withdrawals from the treated waterbody, and result in 100% survival of bioassay fish at all locations before potable withdrawals may resume. Bioassay must be conducted at a minimum of three locations, or at the number of locations equal to 20% of the number of potable withdrawals from the treatment water, whichever number of locations is greatest. There are no potable water rights on any of the three lakes described in this plan.

- **Volatile Organic Compounds (VOC)**

Potable water withdrawals may not resume until VOC concentrations return to background (pre-treatment) levels or fall below 0.5 ppb. Samples must be sent to an accredited environmental laboratory within 48 hours for processing. VOC detection levels must be  $\leq 0.5$  ppb. WDFW will collect VOC samples within a month following treatment, and as needed thereafter until detection levels are at baseline or are  $\leq 0.5$  ppb.

## **2. Irrigation or Livestock Withdrawals:**

Treatment waters must meet standards applicable to crop irrigation and livestock watering required by the rotenone product labels before water withdrawals can resume. Irrigation is unlikely to occur at the time of treatment, as it will be outside of the growing season (WSUE 2022), and the lake will detoxify naturally prior to spring 2024. However, if irrigators with valid water rights require irrigation water at the time of treatment, WDFW will provide it as necessary. Currently, there are no livestock watering restrictions for the rotenone products proposed for use in this treatment. Thus, no water will be provided for livestock watering.

## **15.0 REFERENCES**

Bolding, B. 2015. Discharge management plan for the Washington Department of Fish and Wildlife Lake and Stream Rehabilitation Program. Washington Department of Fish and Wildlife, Olympia.

Finlayson, B., D. Skaar, J. Anderson, J. Carter, D. Duffield, M. Flammang, C. Jackson, J. Overlock, J. Steinkjer, and R. Wilson. 2018. Planning and standard operating procedures for the use of rotenone in fish management – rotenone SOP manual, 2<sup>nd</sup> edition. American Fisheries Society, Bethesda, Maryland.

Washington State University Extension (WSUE). 2022. Gardening in the Inland Northwest – Washington average first frost date map. <https://extension.wsu.edu/spokane/master-gardener-program/home-lawn-and-garden/inw-gardening/> Accessed 3/29/2022.

Washington Department of Ecology (DOE). 2015. Fishery resource management general permit: national pollutant discharge elimination system and State waste discharge general permit. Washington Department of Ecology, Olympia.

## LAKE MANAGEMENT PLANS

Updated March, 2023 – Mike Schmuck

**Water(s):** June, North North Windmill, North Windmill, Windmill and Canal

**Location:** Seep Lakes Wildlife Area, T17N R29E, S21, 22, 27, 28, and 33; approximately 7 miles north of Othello and 6 miles southeast of the southeast corner of Potholes Reservoir, Grant County, WA

	Size:	Avg. Depth:	Volume
June	11 acres	14 feet	156 acre-feet
N.N.Windmill	4 acres	12 feet	44 acre-feet
N.Windmill	20 acres	17 feet	341 acre-feet
Windmill	37 acres	29 feet	1074 acre-feet
Canal	92 acres	21 feet	1960 acre-feet

**Water Source:** Subsurface seepage springs

**Outflow:** Subsurface

### **Management History:**

The June, North-North Windmill, North Windmill, Windmill, and Canal chain of lakes lie southeast of O'Sullivan Dam and Potholes Reservoir. These waters have been popular trout fisheries since the 1960's when opening day-type seasons were in effect. The three upper lakes, June, North-North Windmill, and North Windmill are protected from upstream migration by an impassable falls below North Windmill Lake.

Contamination by warmwater fish species is the largest obstacle to managing these waters as trout fisheries. Undesirable species usually appear with a little help from hobby biologists. Six rehabilitations have been done on Windmill and Canal lakes, the largest waters in this system. The smaller surrounding lakes have been treated fewer times. The earlier rehabilitations targeted illegally introduced crappie, although perch, sunfish, catfish (probably bullheads), and even carp were also eradicated at one time or another. Crappie persisted, or were continually and illegally introduced, through four rehabilitations including two with toxophene. They were no longer present after the 1987 rehabilitation. Pumpkinseed sunfish have been persistent since the early 1980's, and the last three rehabilitations have failed to eradicate this species. Perch were also illegally introduced into Heart Lake during the late 1980's. Lake rehabilitation has provided at least 4-6 years of good trout fishing after each treatment.

Stocking levels for June, North North Windmill, North Windmill, Windmill, and Canal lakes have hovered around 47,000 rainbow trout fingerlings. When productive these waters yield 4-10 trout per trip.

*T&E Flora and Fauna:* Professionals from many resource fields have visited this site countless times during the last 40 years. No known report exists of any threatened or endangered species habitually found in or near these lakes. Occasional visits from both bald and golden eagles occur, although no nests of these two species are known in the area. Protected species of waterfowl and other birds frequently are found here at times, as well.

June, North North Windmill, North Windmill, Windmill, and Canal lakes are currently open to angling year-round reducing the opening day crowds in favor of prolonged and steady angling pressure. The catch limit is five fish, and bait is allowed. Boating access is available at Windmill and Canal lakes, while anglers must walk into the remaining smaller lakes. Expanding populations of sunfish, perch, and possibly other illegally introduced species are competing with trout fry and depressing trout survival. Sunfish are rarely pursued by anglers, and the perch fishery is a relatively small affair. The present fishery is a shadow of the former rainbow fisheries which can occur there.

### **Current Management Objectives:**

Year around, production fishery. Five fish limit, no size or gear restrictions. Provide 3 yearling rainbow trout per angler trip for 1-5,000 anglers per season.

#### 1. Fishery Objectives:

<u>Species</u>	<u>Type</u>	<u>Category</u>	<u>Number of Fish</u>		<u>Avg.Size</u>	<u>Exploit.</u>
			<u>/hour</u>	<u>/Angler</u>		<u>Rate</u>
Rainbow	Prod	Year Around	2	3	12 inches	90% 1-yr-olds

2. Angler use objective (# angler days): Season - 1,000-5,000

#### 3. Stocking Objectives:

<u>Lake</u>	<u>Species</u>	<u>Number of Fish Stocked</u>			<u>Planting Month</u>
		<u>Total</u>	<u>/Acre</u>	<u>/pound</u>	
June	Rainbow	2,000	180	<80	April-May
NN Windmill	Rainbow	1,000	250	<80	April-May
N Windmill	Rainbow	10,000	500	<80	April-May
Windmill	Rainbow	15,000	400	<80	April-May
Canal	Rainbow	35,000	380	<80	April-May

#### E. Management Strategy:

- Plant rainbow fingerlings in spring/fall. Depending on growth this could vary.
- Check yearling growth; should be about 13 inches, adjust stocking rate as necessary.
- Maintain about 15-20 percent of the catch at age 2+ years old, 16-20+ inch fish.
- Spot check angling activity randomly as time allows.
- Monitor all fish species periodically by electrofishing or netting.
- Control spiny-ray species when trout survival is inadequate to produce an acceptable fishery.
- Consider the use of sterile, triploid rainbow trout and brown trout.