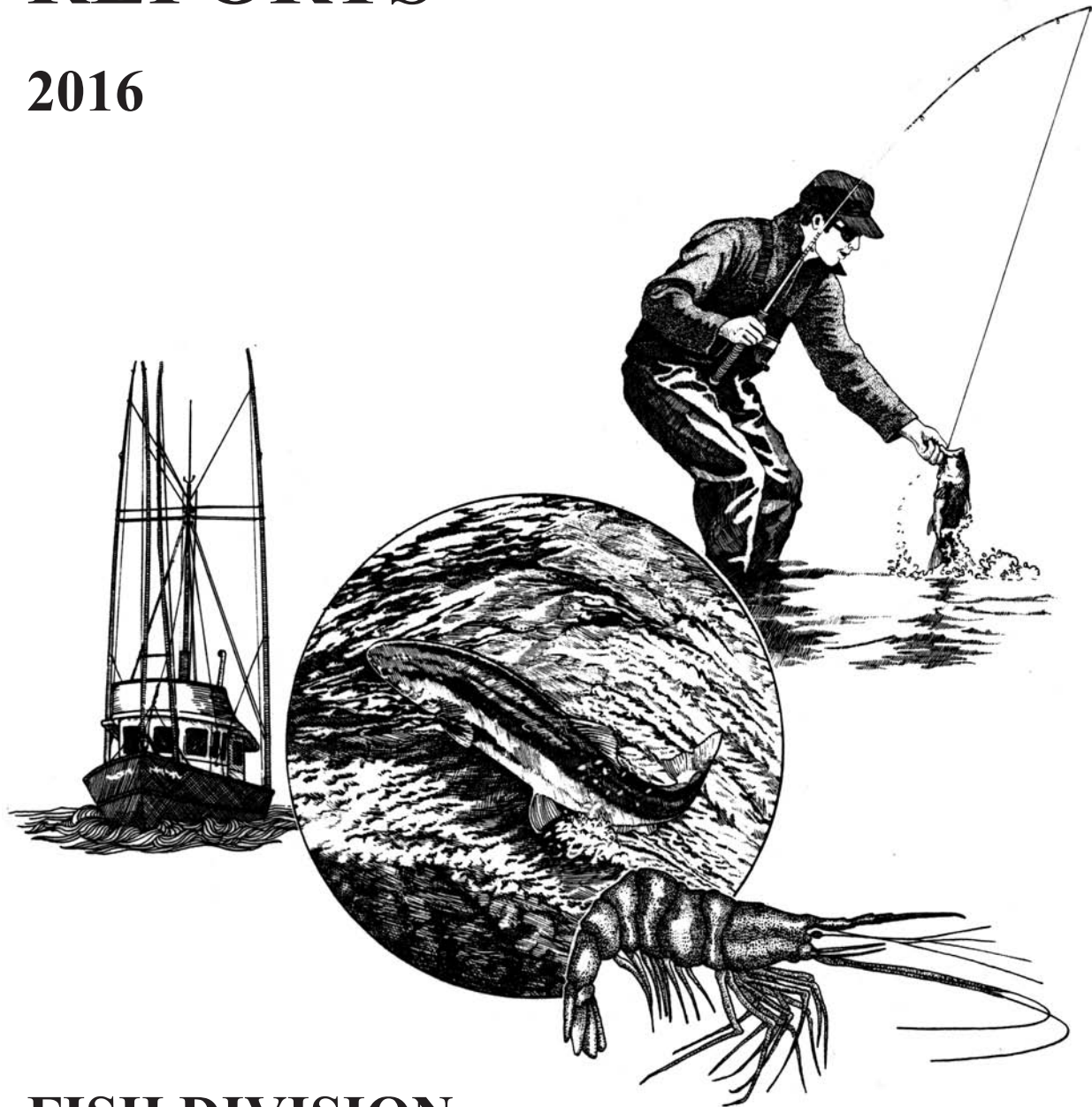


# PROGRESS REPORTS

2016



**FISH DIVISION**  
**Oregon Department of Fish and Wildlife**

2015 Oregon Chub Investigations

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ANNUAL PROGRESS REPORT

FISH RESEARCH PROJECT  
OREGON

PROJECT TITLE: 2015 Oregon Chub Investigations

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Prepared by: Brian L. Bangs  
W. Travis Neal  
Shaun Clements

Oregon Department of Fish and Wildlife  
4034 Fairview Industrial Drive SE  
Salem, Oregon 97302

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## SUMMARY

Oregon chub *Oregonichthys crameri*, a small minnow endemic to the Willamette Valley, was listed as endangered under the federal Endangered Species Act (ESA) in 1993. Factors implicated in the decline of this species included changes in flow regimes and habitat characteristics resulting from the construction of flood control dams, revetments, channelization, diking, and the drainage of wetlands. The Oregon chub was further affected by predation and competition by nonnative species such as largemouth bass *Micropterus salmoides*, crappies *Pomoxis* sp., sunfishes *Lepomis* sp., bullheads *Ameiurus* sp., and western mosquitofish *Gambusia affinis*. In February 2015, Oregon chub became the first fish removed (delisted) from the ESA due to recovery (Federal Register 2015).

Prior to the delisting, the U.S. Fish and Wildlife Service (USFWS) led a multiagency group that developed the Post-Delisting Monitoring Plan (PDM) for the Oregon Chub (U.S. Fish and Wildlife Service 2014). This document provides monitoring guidance for Oregon chub to track changes in distribution, abundance, habitat conditions, and threats after delisting. Monitoring through the PDM will extend, at a minimum, for 9 years. The PDM identifies three Recovery Areas that cover the range of Oregon chub populations: Santiam, Mainstem Willamette, and Middle Fork Willamette. One Recovery Area will be sampled each year and each Recovery Area will be sampled three times during the PDM period. This monitoring program will consist of the following three components: 1) population abundance and distribution monitoring, 2) monitoring the distribution of co-occurring nonnative species, and 3) habitat monitoring. The PDM identifies circumstances that will trigger increased monitoring or potentially lead to a status review under the ESA, and circumstances when there are no longer concerns for Oregon chub and the PDM requirements have been fulfilled. The PDM continues the monitoring program that was initiated in 1991 to evaluate the status and implement the research and recovery objectives listed in the Oregon Chub Recovery Plan (U.S. Fish and Wildlife Service 1998). In addition, we sampled locations in other basins included in our ongoing floodplain study or that were of management or conservation interest.

In 2015, we sampled a total of 118 locations, 29 of which we visited for the first time. We discovered five new populations of Oregon chub; three in the Santiam Recovery Area and two in the Middle Fork Willamette Recovery Area. We confirmed the continued existence of Oregon chub at 60 locations, including 48 naturally occurring and 12 introduced populations. We obtained abundance estimates for 35 naturally occurring populations and 9 introduced populations of Oregon chub that were located throughout the Willamette Basin. We documented 35 populations of Oregon chub  $\geq 500$  individuals; 15 of these populations were in the Santiam Recovery Area, 8 in the Mainstem Willamette Recovery Area, and 12 in the Middle Fork Willamette Recovery Area. We documented nonnative fish at 51% of all occupied Oregon chub habitats sampled in 2015, and discovered that green sunfish *Lepomis cyanellus* had colonized one population in the Mainstem Willamette Recovery Area and two in the Middle Fork Willamette Recovery Area. Our results confirm that habitat conditions continue to support populations of Oregon chub in habitats hydrologically connected to mainstem rivers in

each Recovery Area. Our results suggest that Oregon chub remain secure in the areas sampled without the protection of the ESA based on criteria established by the PDM.

## INTRODUCTION

Oregon chub are endemic to the Willamette River drainage of western Oregon (Markle et al. 1991). This species was formerly distributed throughout the Willamette River Valley (Snyder 1908) in off-channel habitats such as beaver ponds, oxbows, backwater sloughs, and flooded marshes. These habitats usually have little or no water flow, have silty and organic substrate, and have an abundance of aquatic vegetation and cover for concealment and spawning. In the past 100 years off-channel habitats have disappeared because of changes in seasonal flows resulting from the construction of dams throughout the basin, channelization of the Willamette River and its tributaries, and agricultural practices. This loss of habitat, combined with the introduction of nonnative fish species to the Willamette Valley, resulted in a restricted distribution and sharp decline in Oregon chub abundance and a determination of "endangered" status under the federal endangered species act in 1993 (Markle and Pearsons 1990; Rhew 1993).

Since 1991, the Oregon Department of Fish and Wildlife - Native Fish Investigations Program (ODFW) has evaluated the status and implemented the research and recovery objectives listed in the Oregon Chub Recovery Plan (U.S. Fish and Wildlife Service 1998; Bangs et al. 2014a). In 2009, ODFW initiated an additional, ongoing study to assess the effects of flow and temperature modifications and proposed reconnection of floodplain habitats on Oregon chub and other floodplain fishes (Bangs et al. 2014b). Through the coordinated efforts of a multiagency working group, with the aid of private landowners and other non-governmental organizations, the status of the Oregon chub has dramatically improved (Scheerer et al. 2007, Bangs et al. 2014a). The USFWS downlisted the Oregon chub to "threatened" status in 2010 (Federal Register 2010), and in February 2015 Oregon chub became the first fish delisted from the ESA due to recovery (Federal Register 2015).

Prior to delisting the Oregon chub, the USFWS led a multiagency group that developed the Post-Delisting Monitoring Plan (PDM) for the Oregon chub (U.S. Fish and Wildlife Service 2015). This document builds upon the success of the Recovery Plan for the Oregon chub by incorporating the information gained while the species was listed. The PDM period will extend, at a minimum, for nine years to 2023. The PDM identifies three Recovery Areas that cover the range of Oregon chub populations: Santiam, Mainstem Willamette, and Middle Fork Willamette. One Recovery Area will be sampled each year and each Recovery Area will be sampled three times during the PDM period (Table 1).

**Table 1.** Frequency of sampling in each Recovery Area.

| Recovery Area          | Year    |      |      |         |      |      |         |      |      |
|------------------------|---------|------|------|---------|------|------|---------|------|------|
|                        | Cycle 1 |      |      | Cycle 2 |      |      | Cycle 3 |      |      |
| Santiam                | 2015    |      |      | 2018    |      |      | 2021    |      |      |
| Mainstem Willamette    |         | 2016 |      |         | 2019 |      |         | 2022 |      |
| Middle Fork Willamette |         |      | 2017 |         |      | 2020 |         |      | 2023 |

The PDM provides monitoring guidance for Oregon chub following delisting to track changes in distribution, abundance, habitat conditions, and threats. Section 5 of the PDM identifies circumstances that will trigger increased monitoring and identifies circumstances when there are no longer concerns for Oregon chub and the PDM requirements have been fulfilled. The triggers for concluding the PDM are:

I. Population Abundance and Distribution Triggers

1. There are at least 25 populations with population abundance  $\geq 500$  individuals each; and
2. At least 5 populations with  $\geq 500$  individuals each exist in each of the three Recovery Areas; and

II. Nonnative Species Triggers

1. Fewer than 80 percent of all habitats occupied by Oregon chub contain competitive or predatory nonnative species; and
2. New competitive or predatory nonnative species are absent or distributed in less than 30 percent of Oregon chub habitat within each individual Recovery Area; and

III. Habitat Status Triggers

1. The U.S. Army Corps of Engineers does not conduct additional complete reservoir drawdowns upstream of Oregon chub populations, or, if complete reservoir drawdowns occur, no significant adverse changes to the fish community or habitat are caused; and
2. At least 50 percent of the hydrologically connected Oregon chub habitats in a subbasin continue to have sufficient habitat quality to support Oregon chub populations; and

3. A 50-year interval flood event does not occur in the basins containing Oregon chub or a 50-year interval flood event does occur, but does not cause a decline in Oregon chub populations or habitat, or a significant increase in the distribution of nonnative fish.

This report summarizes the surveys conducted in 2015 and evaluates the status of Oregon chub relative to the triggers listed for conclusion of the PDM. In addition, we discuss the history of, and additional opportunities for, introductions of Oregon chub into new habitats.

## METHODS

The PDM defines the three Recovery Areas for the Oregon chub: Santiam, Middle Fork Willamette, and Mainstem Willamette. The Santiam and Middle Fork Willamette Recovery Areas include all locations within the Santiam River basin and Middle Fork Willamette River basin, respectively. The Mainstem Willamette Recovery Area includes the remainder of the Willamette River basin, including the Luckiamute River, Mary's River, McKenzie River, and Molalla River tributaries. In 2015, we focused our monitoring on the Santiam Recovery Area. In addition, we sampled locations in other basins included in our ongoing floodplain study or that were of management or conservation interest. We conducted surveys at 118 locations in the Willamette River drainage. We sampled off-channel habitats using baited minnow traps, seines, dip nets, hoop nets, and boat electrofishing. Minnow traps were cylindrical, were 46 cm long and 23 cm in diameter, were constructed of 3.2 mm wire mesh, and were baited with 1/3 slice of wheat bread. Seines were 1 m tall and 5 m long and constructed of 6.4 mm mesh. Dip nets were constructed of 6.4 mm mesh (stretch measure). Hoop nets consisted of 4 hoops measuring 61 cm in diameter, were 3.1 m long, had two 0.6 m tall by 7.6 m long wings, and were constructed of 1.3 cm mesh (stretch measure). Boat electrofishing was conducted using a Smith-Root 5,000 W generator powered pulsator (model 5.0 GPP). The hoop nets had two wings measuring 0.6 m tall by 7.6 m long with 1.3 cm stretched mesh. We identified and enumerated all fish captured. We recorded the presence and life stage of amphibian and reptile species that we encountered.

We recorded biotic and abiotic characteristics at each location including substrate type, genus and percent of wetted surface area with aquatic vegetation, mean and maximum depth, water temperature, and total wetted surface area. Substrate was categorized as percent fines (<1/16<sup>th</sup> mm), sand (1/16<sup>th</sup>-2 mm), gravel (3-64 mm), cobble (65-256 mm), boulder (>256 mm), and bedrock. We photographed and assigned a unique map code to each new location.

We used minnow traps to obtain mark-recapture population estimates for all fish species, when possible. We baited the traps with one third slice of bread and fished them for three to 18 hours. We measured the total length (TL) of a subsample (n=50) of the Oregon chub that we collected in the traps. We marked all fish with a partial caudal fin clip and returned them to the water. On the second day, if the ratio of unmarked to recaptured fish exceeded 10:1, we repeated this procedure and marked all unmarked fish captured on the



second day. We typically marked fish until a minimum of 15 percent of the population was marked, based on previous population estimates. We estimated population abundance using a single-sample mark-recapture model (Ricker 1975). To calculate population abundance, we used the total number of marked fish, and the catch and recaptures from the last sample date. We calculated 95% confidence intervals using a Poisson approximation (Ricker 1975). Our minnow traps were unable to catch fish smaller than  $\approx 30$  mm (TL), and these fish were assumed to be young-of-the-year (Scheerer and McDonald 2003) and were not included in the abundance estimates. In addition, in habitats that have at least periodic open-water connection to adjacent waterbodies, we checked each captured Oregon chub for a VIE tag, which were implanted during previous studies for tracking movement among populations (Bangs et al. 2013).

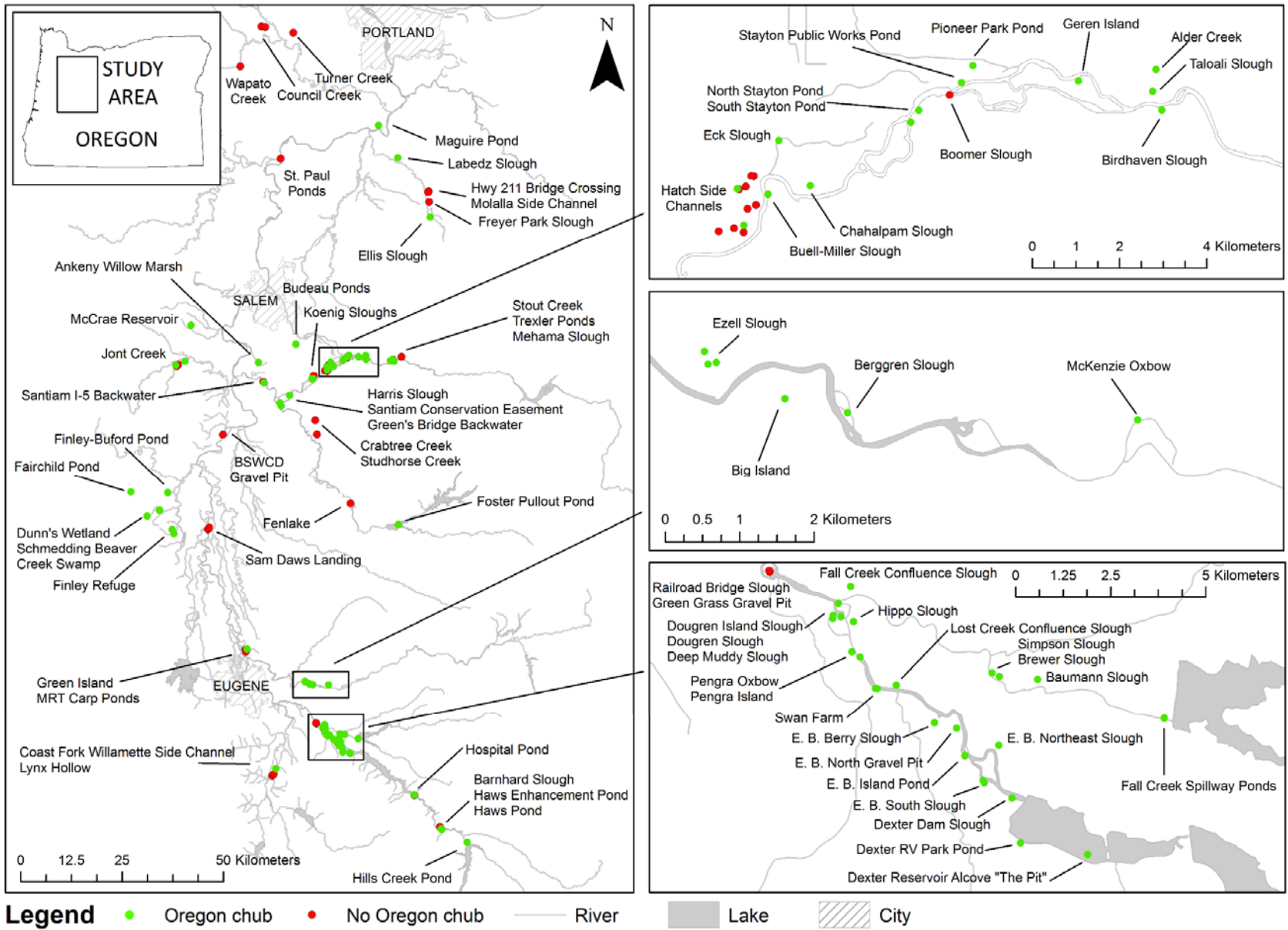
We defined a population as a group of Oregon chub that occupies a single, defined waterbody. If there was an open-water connection and the potential for frequent movement of chub between adjacent sloughs or ponds, then we considered adjacent locations to be part of a single population. At locations where abundance estimates were obtained in 2014 (Bangs et al. 2014) and 2015, we compared the 95% confidence intervals. If the ranges of each 95% confidence intervals did not overlap, we defined these changes in abundance as significant.

## RESULTS

Detailed descriptions of habitat characteristics and the fish species present at each of the 118 locations sampled in 2015 (Figure 1) are presented in **APPENDIX A**.

We obtained population estimates for Oregon chub at 44 locations, and confirmed the continued presence of Oregon chub at 16 locations (Tables 1 and 2). We estimated the population abundance of Oregon chub at 16 locations in the Santiam River Recovery Area, 14 of which had  $\geq 500$  Oregon chub. We captured over 500 Oregon chub at Taloali Slough, but did not estimate abundance at this location. We were unable to capture Oregon chub at Boomer Slough, where Oregon chub were discovered in 2014. We discovered three new locations containing Oregon chub (Eck Slough, Hatch Side Channels, and Alder Creek). We noted significant increases in Oregon chub abundance at Foster Pullout Pond and Santiam Conservation Easement. We noted significant declines in Oregon chub abundance at Chahalpam Slough, Geren Island North Channel, Mehama Slough, Pioneer Park, and South Stayton Pond. We noted an apparent increase in Oregon chub abundance at Stout Creek, and apparent declines in abundance at Santiam I-5 Backwater and Stayton Public Works Pond.

We estimated the population abundance of Oregon chub at seven locations in the Mainstem Willamette River Recovery Area. There were eight populations in the Mainstem Willamette drainage with  $\geq 500$  Oregon chub. We were unable to locate Oregon chub at Williams Pond and St. Paul Pond desiccated in the summer of 2015. We noted significant



**Figure 1.** Survey locations for Oregon chub in the Willamette River basin in 2015. Green circles indicate locations where Oregon chub were collected. Red circles indicate locations where Oregon chub were not collected. Overlapping symbols represent multiple locations occurring at or near the same survey location.

**Table 1.** Oregon chub population abundance estimates from 2008-2014, listed by Recovery Area. Basins: CFW= Coast Fork Willamette, FALL= Fall Creek, LONG = Long Tom, LUCK= Luckiamute, MARY= Mary's, MCK= McKenzie, MFW= Middle Fork Willamette, MILL= Mill Creek, MOL= Molalla, MS= Mainstem Willamette and tributaries, MOL= Molalla, NS= North Santiam, SANT= Mainstem Santiam, SS= South Santiam. We also included a summary of data prior to 2007, including the years when we first discovered or introduced each population and the ranges of abundance. Abundance was calculated using a mark-recapture model, except where numbers are shown in bold, which only represent the number of fish captured. Location names in bold italics are locations where Oregon chub were introduced. The numbers of fish stocked at introduction locations are shown in parentheses.

| Location name                        | Basin | First discovered/ |                    | 2009                    | 2010            | 2011          | 2012           | 2013      | 2014          | 2015         |  |
|--------------------------------------|-------|-------------------|--------------------|-------------------------|-----------------|---------------|----------------|-----------|---------------|--------------|--|
|                                      |       | introduced        | Range through 2008 |                         |                 |               |                |           |               |              |  |
| <b>Mainstem Willamette</b>           |       |                   |                    |                         |                 |               |                |           |               |              |  |
| <b>Ankeny Willow Marsh</b>           | MS    | 2004              | 500 - 35,650       | 46,560                  | 21,790          | 96,810        | 82,800         | 47,920    | 19,340        | 16,930       |  |
| Ellis Slough                         | MOL   | 2014              |                    |                         |                 |               |                |           | 1,100         | 6,580        |  |
| McKenzie Oxbow                       | MCK   | 2009              |                    | 2,420                   | 3,000           | 3,550         | 2,880          | 6,180     | 9,030         | 3,700        |  |
| Big Island                           | MCK   | 2002              | 190 - 940          | 610                     | 1,240           | 400           | 330            | 1,160     | 860           | 2,160        |  |
| <b>Dunn Wetland</b>                  | MS    | 1997              | 200 - 46,330       | 34,300                  | 28,510          | 47,350        | 44,160         | 6,440     | 14,600        | <b>1,000</b> |  |
| <b>Finley-Buford Pond</b>            | MARY  | 2011              |                    |                         |                 | (160)         | 460            | 1,010     | <b>503</b>    | <b>800</b>   |  |
| Berggren Slough                      | MCK   | 2009              |                    | 520                     | 520             | 640           | 920            | 610       | 290           | 750          |  |
| <b>Maguire Pond</b>                  | MOL   | 2015              |                    | 0                       |                 |               |                |           |               | (510)        |  |
| Coast Fork Side Channels             | CFW   | 2002              | 16 - 150           | 100                     | 190             | 80            | 70             | 60        | 240           | 240          |  |
| <b>McCrae Reservoir</b>              | LUCK  | 2013              |                    |                         |                 |               |                | (29)      | (14) <b>0</b> | <b>208</b>   |  |
| <b>Fairchild Pond</b>                | MARY  | 2015              |                    |                         |                 |               |                |           |               | (150)        |  |
| <b>Schmedding Beaver Creek Swamp</b> | MARY  | 2015              |                    |                         |                 |               |                |           |               | (150)        |  |
| Labeled Slough                       | MOL   | 2013              |                    |                         |                 |               |                | <b>29</b> | 90            | 100          |  |
| Ezell Slough                         | MCK   | 2005              | 6                  |                         |                 | <b>29</b>     | 140            |           |               | <b>65</b>    |  |
| Green Island                         | MCK   | 2007              | 12                 | <b>2</b>                | <b>0</b>        | 10            | <b>8</b>       | <b>3</b>  | <b>2</b>      | <b>22</b>    |  |
| Finley Beaver Pond                   | MARY  | 2010              |                    |                         | 420             | 310           | 1,340          | 1,600     | <b>37</b>     | <b>10</b>    |  |
| <b>Finley Display Pond</b>           | MARY  | 1998              | 60 - 1,750         | (85) 320                | (119) 500       | (67) 420      | 220            | 120       | 530           | <b>5</b>     |  |
| Finley Gray Creek Swamp              | MARY  | 1993              | 230 - 2,140        | 1,700                   | 2,350           | 2,150         | 1,720          | 1,370     | <b>5</b>      | <b>5</b>     |  |
| Jont Creek                           | LUCK  | 2012              |                    |                         |                 |               | 90             | 370       | 140           | <b>4</b>     |  |
| Dry Muddy Creek                      | MS    | 1994              |                    |                         |                 | <b>20</b>     | 500            | <b>52</b> | <b>34</b>     | <b>2</b>     |  |
| Feyrer Park Slough                   | MOL   | 2013              |                    |                         |                 |               |                | <b>1</b>  | <b>0</b>      | <b>0</b>     |  |
| <b>Williams (Murphy) Pond</b>        | MARY  | 2011              |                    |                         |                 | (32)          | (182) <b>7</b> | 1,080     | <b>500</b>    | <b>0</b>     |  |
| Lynx Hollow Side Channels            | CFW   | 2005              | 0 - 2              | <b>4</b>                | <b>2</b>        | <b>2</b>      | <b>2</b>       | <b>4</b>  | <b>0</b>      | <b>0</b>     |  |
| <b>St. Paul Ponds</b>                | MS    | 2008              | 25                 | (64) <b>2</b>           | (106) <b>32</b> | 4,430         | 510            | 440       | <b>53</b>     | dry          |  |
| Shetzline Pond                       | MCK   | 2002              | 120 - 1,050        | 300                     | 350             | 5,750         | 9,270          | 3,240     | 4,330         |              |  |
| <b>Sprick Pond</b>                   | CFW   | 2008              | 12                 | (10) <b>12</b>          | (31) <b>22</b>  | (12) 80       | 700            | 610       | <b>500</b>    |              |  |
| <b>Finley Cheadle Pond</b>           | MARY  | 2002              | 50 - 3,520         | (85) 1,140              | (118) 1,130     | (30) <b>0</b> | (184) 20       | 160       | 370           |              |  |
| <b>Russell Pond</b>                  | MCK   | 2001              | 350 - 1,400        | 1,290                   | 2,780           | 340           | 340            | 130       | 360           |              |  |
| Vickery Park Slough                  | MCK   | 2011              |                    |                         |                 | <b>22</b>     | 60             | <b>12</b> | 80            |              |  |
| Hendrick's Bridge Slough             | MCK   | 2011              |                    |                         |                 | <b>2</b>      | 70             | <b>22</b> | <b>39</b>     |              |  |
| Wagonwheel Park                      | MOL   | 2014              |                    |                         |                 |               |                |           | <b>25</b>     |              |  |
| Camous Creek                         | MS    | 1993              | 5                  |                         |                 |               |                | <b>56</b> | <b>22</b>     |              |  |
| Muddy Creek                          | MS    | 2007              | 3                  |                         |                 | <b>33</b>     | <b>0</b>       | <b>46</b> | <b>2</b>      |              |  |
| Milk Creek                           | MOL   | 2014              |                    |                         |                 |               |                |           | <b>1</b>      |              |  |
| Herman Pond                          | CFW   | 2002              | 3 - 420            | <b>0</b>                | 200             | 130           | 190            | 150       |               |              |  |
| Cedar Creek                          | MCK   | 2012              |                    |                         |                 |               | 170            | <b>25</b> |               |              |  |
| <b>Ellison Pond and Slough</b>       | MCK   | 2012              |                    |                         |                 |               | (110) <b>1</b> | <b>9</b>  |               |              |  |
| Dunawi Creek                         | MS    | 2012              |                    |                         |                 |               | <b>5</b>       | <b>0</b>  |               |              |  |
| <b>Jampolsky Wetlands</b>            | MS    | 2004              | 500 - 8,320        | .....denied access..... |                 |               |                |           | <b>0</b>      |              |  |
| Grant Farm Channel                   | MCK   | 2012              |                    |                         |                 |               | <b>8</b>       | <b>0</b>  |               |              |  |
| Springfield Oxbow                    | MCK   | 2012              |                    |                         |                 |               | <b>4</b>       |           |               |              |  |
| Camas Swale                          | CFW   | 1992              | 0 - 2              | <b>0</b>                |                 |               | <b>0</b>       |           |               |              |  |
| Bull Run Creek                       | MS    | 2005              | 0 - 2              |                         |                 |               |                |           |               |              |  |
| Little Muddy Creek tributary         | MS    | 2004              | 0 - 5              |                         |                 |               |                |           |               |              |  |

**Table 1** (continued).

| Location name                 | Basin | First discovered/<br>introduced | Range through<br>2000 | 2009                    | 2010      | 2011       | 2012      | 2013      | 2014      | 2015       |
|-------------------------------|-------|---------------------------------|-----------------------|-------------------------|-----------|------------|-----------|-----------|-----------|------------|
| <b>Santiam Recovery Area</b>  |       |                                 |                       |                         |           |            |           |           |           |            |
| <b>Budeau North Pond</b>      | NS    | 2010                            |                       |                         | (310)     | 2,240      | 5,730     | 8,350     |           | 11,260     |
| <b>Budeau South Pond</b>      | NS    | 2010                            |                       |                         | (312)     | 890        | 4,160     | 2,810     |           | 6,180      |
| Birdhaven Slough              | NS    | 2014                            |                       |                         |           |            |           |           | 5350      | 5,980      |
| <b>Foster Pullout Pond</b>    | NS    | 1999                            | 85 - 2,640            | 2,640                   | 2,010     | 2,360      | 2,240     | 3,410     | 2,420     | 5,050      |
| Pioneer Park Pond             | NS    | 1997                            | 0 - 420               | 830                     | 540       | 1,470      | 2,710     | 1,630     | 3,880     | 2,220      |
| Koenig Slough                 | NS    | 2011                            |                       |                         |           | <b>443</b> | 2,410     | 1,780     |           | 1,640      |
| <b>North Stayton Pond</b>     | NS    | 2010                            |                       |                         | (620)     | 300        | 4,370     | 3,720     | <b>50</b> | 1,090      |
| Mehama Slough                 | NS    | 2010                            |                       |                         | <b>15</b> | 1,240      | 1,080     | 1,380     | 2,800     | 1,030      |
| Santiam Conservation Easement | NS    | 1994                            | 0 - 1,250             | <b>22</b>               | 530       | <b>54</b>  | 260       | 310       | 300       | 930        |
| Buell-Miller Slough           | NS    | 2010                            |                       |                         | <b>2</b>  | 710        | 170       | 760       |           | 730        |
| Green's Bridge Slough         | NS    | 1993                            | 0 - 8                 | 240                     | 610       | 370        | 190       | 670       | 510       | 690        |
| Chahalpam (Gray) Slough       | NS    | 1995                            | 0 - 700               | .....denied access..... |           |            | 520       | 2430      | 2200      | 680        |
| <b>South Stayton Pond</b>     | NS    | 2006                            | 54 - 1,710            | 142) 4,970 232)         | 6,230     | 2,210      | 2,000     | 1,100     | 1,370     | 620        |
| Geren Island North Channel    | NS    | 1996                            | 210 - 8,660           | 560                     | 2,230     | 3,030      | 1,940     | 2,280     | 1,370     | 610        |
| Taloali Slough                | NS    | 2013                            |                       |                         |           |            |           | <b>4</b>  |           | <b>581</b> |
| Stout Creek                   | NS    | 2013                            |                       |                         |           |            |           | <b>39</b> | <b>54</b> | 420        |
| Eck Slough                    | NS    | 2015                            |                       |                         |           |            |           |           |           | 43         |
| Hatch Side Channels           | NS    | 2015                            |                       |                         |           |            |           |           |           | <b>33</b>  |
| Stayton Public Works Pond     | NS    | 1998                            | 0 - 530               | 30                      | <b>3</b>  | 110        | 1,100     | 1,530     | 260       | <b>22</b>  |
| Harris Slough                 | NS    | 2011                            |                       |                         |           | <b>18</b>  | 80        | 30        | 30        | <b>19</b>  |
| Trexler Farm Ponds            | NS    | 2013                            |                       |                         |           |            |           | <b>53</b> | <b>28</b> | <b>4</b>   |
| Santiam I-5 Side Channels     | SANT  | 1997                            | 2 - 350               | 100                     | 160       | 280        | 100       | 420       | 30        | <b>3</b>   |
| Alder Creek                   | NS    | 2015                            |                       |                         |           |            |           |           |           | <b>1</b>   |
| Boomer Slough                 | NS    | 2014                            |                       |                         |           |            |           |           | <b>6</b>  | <b>0</b>   |
| Logan Slough                  | NS    | 1997                            |                       |                         |           | <b>1</b>   | <b>0</b>  | <b>0</b>  |           | <b>0</b>   |
| Foster Reservoir              | NS    | 2014                            |                       |                         |           |            |           |           | <b>9</b>  |            |
| Hospital Slough               | SS    | 2009                            |                       | <b>2</b>                |           |            | <b>10</b> |           |           |            |
| Cold Creek Slough             | NS    | 2011                            |                       |                         |           | <b>59</b>  | <b>0</b>  |           |           |            |
| <b>Menear's Bend</b>          | NS    | 2000                            |                       |                         |           |            |           |           |           |            |

**Table 1 (continued).**

| Location name                     | Basin | First discovered/<br>introduced | Range through 2008 | 2009  | 2010    | 2011        | 2012   | 2013   | 2014  | 2015   |
|-----------------------------------|-------|---------------------------------|--------------------|-------|---------|-------------|--------|--------|-------|--------|
| <b>Middle Fork Willamette</b>     |       |                                 |                    |       |         |             |        |        |       |        |
| <b>Fall Creek Spillway Ponds</b>  | MFW   | 1996                            | 480 - 7,770        | 2,930 | 4,110   | 6,690       | 6,750  | 9,110  | 9,900 | 13,400 |
| Dexter Reservoir RV Alcove - DEX3 | MFW   | 1992                            | 15 - 3,310         | 2,280 | 1,800   | 940         | 190    | 3,550  | 3,960 | 6,550  |
| Elijah Bristow Island Pond        | MFW   | 2003                            | 420 - 2,780        | 870   | 2,050   | 1,400       | 840    | 2,250  | 890   | 3,950  |
| <b>Haws Enhancement Pond</b>      | MFW   | 2009                            |                    | (47)  | (86) 1  | 3,150       | 900    | 790    | 1,800 | 3,220  |
| Elijah Bristow North Gravel Pit   | MFW   | 2011                            | 0                  | 0     | 0       | 3           | 60     | 450    | 510   | 1,870  |
| Dexter Reservoir Alcove - PIT1    | MFW   | 1992                            | 40 - 1,440         | 1,370 | 1,020   | 350         | 680    | 2,590  | 870   | 1,740  |
| Elijah Bristow South Slough       | MFW   | 2008                            | 1                  | 880   | 640     | 380         | 230    | 280    | 750   | 1,550  |
| Elijah Bristow Northeast Slough   | MFW   | 1999                            | 210 - 1,340        | 550   | 670     | 670         | 1,280  | 890    | 1,030 | 1,360  |
| Dougren Slough                    | MFW   | 2008                            | 1                  | 1,640 | 830     | 1,730       | 1,070  | 522    | 958   | 1,150  |
| Dexter Dam Slough                 | MFW   | 2009                            |                    | 640   | 510     | 820         | 920    | 1,090  | 2,120 | 900    |
| Hospital Pond                     | MFW   | 1993                            | 690 - 5,040        | 730   | 1,330   | 2,860       | 2,110  | 1,360  | 2,640 | 870    |
| Lost Creek Slough                 | MFW   | 2012                            |                    |       |         |             | 13     | 21     | 42    | 500    |
| Elijah Bristow Berry Slough       | MFW   | 1993                            | 1,190 - 5,460      | 8,130 | 2,360   | 1,040       | 1,440  | 1,170  | 510   | 330    |
| <b>Hills Creek Pond</b>           | MFW   | 2010                            |                    |       | (1,127) | 23,000      | 13,460 | 14,610 | 1,950 | 330    |
| Haws Pond                         | MFW   | 2005                            | 120 - 440          | 470   | 810     | 350         | 600    | 510    | 510   | 210    |
| Swan Farm                         | MFW   | 2015                            |                    |       |         |             |        |        |       | 140    |
| Dougren Island Slough             | MFW   | 2011                            |                    |       |         | 34          | 280    | 1,700  | 323   | 110    |
| Pengra Island Slough              | MFW   | 2003                            |                    | 200   | 60      | 40          | 60     | 40     | 60    | 110    |
| Deep Muddy Slough                 | MFW   | 2009                            | 0                  | 10    | 40      | 10          | 10     | 10     | 29    | 90     |
| Baumann Slough                    | FALL  | 2012                            |                    |       |         |             | 1      | 0      | 90    | 20     |
| Brewer Slough                     | FALL  | 2013                            |                    |       |         |             |        | 1      | 40    | 20     |
| Hippo Slough                      | MFW   | 2015                            |                    |       |         |             |        |        |       | 9      |
| Pengra Oxbow Slough               | MFW   | 2008                            | 1                  | 9     | 60      | 80          | 20     | 160    | 100   | 2      |
| Simpson Slough                    | FALL  | 2012                            |                    |       |         |             | 1      | 0      | 1     | 2      |
| Fall Creek Confluence Slough      | FALL  | 2012                            |                    |       |         |             | 5      | 1      | 3     | 1      |
| Barnhard Slough                   | MFW   | 2000                            | 0 - 7              | 2     | 1       | 0           | 0      | 0      | 0     | 0      |
| Green Grass Gravel Pit            | MFW   | 2012                            |                    |       |         |             | 24     | 7      | 3     | 0      |
| Hospital Impoundment Pond         | MFW   | 1995                            | 0 - 6              |       | 80      | 70          | 20     | 1      | 0     | 0      |
| Railroad Bridge Slough            | MFW   | 2009                            | 0                  | 80    | 20      | 30          | 20     | 0      | 8     | 0      |
| East Fork Minnow Creek Pond       | MFW   | 1993                            | 1,730 - 8,770      | 1,340 | 2,980   | 2,170       | 3,330  | 1,340  | 1,890 |        |
| Buckhead Creek                    | MFW   | 1992                            | 2 - 7,140          | 3,600 | 1,280   | 1,900       | 3,180  | 4,600  | 1,794 |        |
| Yeti Slough                       | MFW   | 2014                            |                    |       |         |             |        | 1,060  | 1,059 |        |
| <b>Wicopee Pond</b>               | MFW   | 1988                            | 0 - 5,430          | 3,040 | 2,200   | 3,390 (128) | 5,620  | 4,380  | 35    |        |
| Shady Dell Pond                   | MFW   | 1993                            | 1,630 - 7,250      | 2,070 | 3,110   | 1,760       | 1,600  | 2,890  | 2     |        |
| Oakridge Slough                   | MFW   | 1994                            | 0 - 480            | 0     |         | 1           | 4      | 3      | 0     |        |
| Salt Creek Diversion Canal        | MFW   | 2012                            |                    |       |         |             | 150    | 2      |       |        |
| Elijah Bristow Large Gravel Pit   | MFW   | 1992                            | 0 - 8              |       |         |             |        | 0      |       |        |
| Elijah Bristow Small Gravel Pit   | MFW   | 1992                            | 0 - 31             |       |         |             |        | 0      |       |        |
| Rattlesnake Creek                 | MFW   | 1992                            | 0 - 5              | 2     |         |             | 0      | 0      |       |        |
| TNC Island Slough                 | MFW   | 2012                            |                    |       |         |             | 2      |        |       |        |
| Lookout Point Reservoir           | MFW   | 2012                            |                    |       |         |             | 1      |        |       |        |
| Pudding Creek                     | MFW   | 2011                            |                    |       |         | 1           | 0      |        |       |        |
| Jasper Park Slough                | MFW   | 1994                            | 0 - 3              | 0     |         | 0           |        |        |       |        |
| <b>East Ferrin Pond</b>           | MFW   | 1994                            | 0 - 7,160          | 0     | 0       |             |        |        |       |        |
| Springfield Millrace Slough       | MFW   | 2009                            |                    | 8     | 0       |             |        |        |       |        |
| Dexter East Alcove                | MFW   | 1992                            | 0 - 40             | 0     |         |             |        |        |       |        |
| Dexter Reservoir                  | MFW   | 2002                            | 1                  |       |         |             |        |        |       |        |
| Wallace Slough                    | MFW   | 1997                            | 0 - 3              |       |         |             |        |        |       |        |
| <b>West Ferrin Pond</b>           | MFW   | 1992                            | 0 - 525            |       |         |             |        |        |       |        |

**Table 2.** 2015 Oregon chub abundance estimates and 95% confidence limits for locations in the Willamette Valley, Oregon. Locations are grouped by Recovery Area and drainage. Note: the Mainstem Recovery Area contains multiple river drainages.

| Location                                    | Estimate | 95% Confidence limits |        |
|---|----------|-----------------------|--------|
|   |          | Lower                 | Upper  |
| <b>Mainstem Recovery Area</b>               |          |                       |        |
| <b>Mainstem Willamette River Drainage</b>   |          |                       |        |
| Ankeny Willow Marsh                         | 16,930   | 15,710                | 18,237 |
| <b>McKenzie River Drainage</b>              |          |                       |        |
| McKenzie Oxbow                              | 3,700    | 3,130                 | 4,370  |
| Big Island                                  | 2,160    | 1,850                 | 2,530  |
| Berggren Slough                             | 750      | 660                   | 860    |
| <b>Molalla River Drainage</b>               |          |                       |        |
| Ellis Slough                                | 6,580    | 5,570                 | 7,760  |
| Labeled Slough                              | 100      | 60                    | 170    |
| <b>Coast Fork Willamette River Drainage</b> |          |                       |        |
| Coast Fork Side Channels                    | 240      | 90                    | 470    |
| <b>Santiam River Recovery Area</b>          |          |                       |        |
| Budeau North                                | 11,260   | 10,090                | 12,560 |
| Budeau South                                | 6,180    | 5,640                 | 6,760  |
| Birdhaven Slough                            | 5,980    | 4,290                 | 5,950  |
| Foster Pullout Pond                         | 5,050    | 4,290                 | 5,950  |
| Pioneer Park Pond                           | 2,220    | 1,860                 | 2,650  |
| South Stayton Pond                          | 1,370    | 1,110                 | 1,680  |
| Koenig Slough                               | 1,640    | 1,420                 | 1,910  |
| North Stayton Pond                          | 1,090    | 980                   | 1,230  |
| Mehama Slough                               | 1,030    | 920                   | 1,150  |
| Santiam Conservation Easement               | 830      | 620                   | 1,100  |
| Buell-Miller Slough                         | 730      | 620                   | 860    |
| Green's Bridge Slough                       | 690      | 570                   | 830    |
| Chahalpam Slough                            | 680      | 610                   | 750    |
| Geren Island North Channel                  | 610      | 520                   | 720    |
| Stout Creek                                 | 420      | 130                   | 730    |
| Eck Slough                                  | 40       | 20                    | 90     |

Table 2 continued on next page

**Table 2** (continued).

| Location                                    | Estimate | 95% Confidence limits |        |
|---|----------|-----------------------|--------|
|   |          | Lower                 | Upper  |
| <b>Middle Fork Willamette Recovery Area</b> |          |                       |        |
| Fall Creek Spillway Ponds                   | 9,900    | 8,540                 | 11,470 |
| Dexter Reservoir Alcove "DEX3"              | 6,550    | 5,930                 | 7,230  |
| Haws Enhancement Pond                       | 3,222    | 2,820                 | 3,690  |
| Elijah Bristow North Gravel Pond            | 1,870    | 1,560                 | 2,230  |
| Elijah Bristow South Slough                 | 1,550    | 1,350                 | 1,790  |
| Dexter Reservoir Alcove "PIT1"              | 1,470    | 1,270                 | 1,700  |
| Elijah Bristow Northeast Slough             | 1,360    | 1,170                 | 1,600  |
| Dougren Slough                              | 1,150    | 960                   | 1,400  |
| Dexter Dam Slough                           | 900      | 750                   | 1,080  |
| Elijah Bristow Island Pond                  | 890      | 630                   | 1,250  |
| Hospital Pond                               | 870      | 740                   | 1,020  |
| Lost Creek Slough                           | 500      | 400                   | 640    |
| Elijah Bristow Berry Slough                 | 330      | 100                   | 580    |
| Hills Creek Pond                            | 330      | 130                   | 650    |
| Haws Pond                                   | 210      | 150                   | 310    |
| Swan Farm                                   | 140      | 90                    | 210    |
| Dougren Island Slough                       | 110      | 70                    | 170    |
| Pengra Island Slough                        | 110      | 70                    | 180    |
| Deep Muddy Slough                           | 30       | 20                    | 50     |
| Baumann Slough                              | 20       | 10                    | 40     |
| Brewer Slough                               | 20       | 10                    | 40     |

increases in Oregon chub abundance at Berggren Slough, Big Island, and Ellis Slough. We noted a significant decline in Oregon chub abundance at McKenzie Oxbow.

We estimated the population abundance of Oregon chub at 21 locations in the Middle Fork Willamette River Recovery Area. There were 12 populations in the Middle Fork Willamette drainage with  $\geq 500$  Oregon chub. The largest population was located at Fall Creek Spillway Ponds, where Oregon chub were introduced in 1996. We noted significant increases in Oregon chub abundance at Dexter Reservoir RV Alcove – DEX3, Elijah Bristow Island Pond, Elijah Bristow North Gravel Pit, Elijah Bristow South Slough, Fall Creek Spillway Ponds, and Haws Enhancement Pond. We noted significant declines in Oregon chub abundance at Dexter Alcove “The Pit”, Dexter Dam Slough, Hills Creek Pond, and Hospital Pond. We noted an apparent decline in Oregon chub abundance at Pengra Oxbow. We discovered two new naturally occurring Oregon chub populations at Hippo Slough and Swan Farm in the Middle Fork Willamette drainage.

## **DISCUSSION**

### **Status of Naturally Occurring Populations**

In 2015, we documented 24 naturally occurring populations of Oregon chub with  $\geq 500$  individuals in the Willamette River basin; four of these populations in the Mainstem Recovery Area, 10 in the Santiam Recovery Area, and 10 in the Middle Fork Willamette Recovery Area. Additionally, six naturally occurring Oregon chub populations, comprised of 500 or more individual, have been previously documented (Bangs et al. 2014), but were not included in our 2015 sampling effort. There are two unsampled populations in the Mainstem Recovery Area and four in the Middle Fork Willamette Recovery Area. Despite finding Oregon chub in a greater extent of their historic range, we have not found Oregon chub populations in some areas where they were documented historically, such as downstream of Willamette falls near the mouth of the Clackamas River, in mainstem Willamette River sloughs and backwaters, or in the Long Tom River and Calapooia River basins.

In recent years we have documented a number of newly discovered populations in habitats that are frequently hydrologically connected (have an open water connection to the adjacent river). In 2015 we discovered Oregon chub in five new connected locations. However, we were unable to capture Oregon chub in three connected locations where they were present in 2014. Two-thirds (60 out of 90) of the locations containing Oregon chub are connected habitats.

### **Status of Introduced Populations and Habitat Restoration Projects**

One of the key components to the successful recovery of the Oregon chub was the implementation of a program to introduce Oregon chub into suitable habitats within its historic range. Twenty-four new populations have been established since 1988 (Table 3). In addition,



**Table 3.** Oregon chub introduction and habitat restoration locations, donor populations, ownership of the locations, numbers of fish introduced, and year of first introduction. There were no chub introductions between 1988 and 1996. Ownership codes: ACOE= U.S. Army Corps of Engineers, USFS= U.S. Forest Service, ODFW= Oregon Department of Fish and Wildlife, and USFWS= U.S. Fish and Wildlife Service.

| Location name                       | Ownership | Donor site (introduced populations)                              | Year |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Total moved |      |      |       |       |       |     |    |
|-------------------------------------|-----------|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------------|------|------|-------|-------|-------|-----|----|
|                                     |           |  | 1988 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |             | 2012 | 2013 | 2014  | 2015  |       |     |    |
| <b>Molalla River</b>                |           |  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      |       |       |       |     |    |
| Maguire Pond                        | private   | Ellis Slough<br>Labeledz Slough                                  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      | 500  | 500   |       |       |     |    |
|                                     |           |  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             | 10   | 10   |       |       |       |     |    |
| <b>Luckiamute River</b>             |           |  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      |       |       |       |     |    |
| McCrae Reservoir                    | private   | Jont Creek   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             | 29   | 13   | 42    |       |       |     |    |
| <b>Santiam River</b>                |           |  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      |       |       |       |     |    |
| Budeau North Pond                   | private   | South Stayton Pond   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      | 310  | 310   |       |       |     |    |
| Budeau South Pond                   | private   | South Stayton Pond   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      | 312  | 312   |       |       |     |    |
| Foster Pullout Pond                 | ACOE      | Geren Island   |      |      |      |      | 85   | 20   | 75   | 50   | 158  | 112  |      |      |      |      |      |      |      |             |      |      | 500   |       |       |     |    |
| Menear's Bend                       | ACOE      | Geren Island   |      |      |      |      |      | 15   |      | 26   |      |      |      |      |      |      |      |      |      |             |      |      | 41    |       |       |     |    |
| North Stayton Pond                  | ODFW      | South Stayton Pond   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      | 620  | 620   |       |       |     |    |
| South Stayton Pond                  | ODFW      | Stayton Public Works Pond<br>Geren Island<br>Pioneer Park Slough |      |      |      |      |      |      |      |      |      |      |      | 44   | 26   |      |      |      |      | 3           |      |      | 73    | 73    |       |     |    |
|                                     |           |  |      |      |      |      |      |      |      |      |      |      |      | 10   | 41   |      |      |      |      | 83          |      |      | 232   | 232   |       |     |    |
|                                     |           |  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      | 134   | 134   |       |     |    |
| <b>Mainstem Willamette River</b>    |           |  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      |       |       |       |     |    |
| Ankeny Willow Marsh                 | USFWS     | Dunn Wetland   |      |      |      |      |      |      |      |      |      |      | 500  |      |      |      |      |      |      |             |      |      |       | 500   |       |     |    |
|                                     |           | Jampolsky Wetlands <sup>a</sup>                                  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      |       | 1,525 | 1,525 |     |    |
| Dunn Wetland                        | private   | Geren Island   |      |      |      | 200  |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      |       | 200   | 200   |     |    |
|                                     |           | Elijah Bristow Berry Slough                                      |      |      |      |      | 300  |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      |       | 300   | 300   |     |    |
|                                     |           | Shady Dell   |      |      |      |      | 73   |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      |       | 73    | 73    |     |    |
| Fairchild Pond                      | private   | Finley-Buford Pond   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      | 150   | 150   |       |     |    |
| Finley Beaver Pond <sup>b</sup>     | USFWS     | -----  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      | ----- | ----- | ----- |     |    |
| Finley-Buford Pond                  | private   | Finley Gray Creek Swamp  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      | 150  |       | 150   | 150   |     |    |
|                                     |           | Finley Beaver Pond   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      | 10   |       | 10    | 10    |     |    |
| Finley Cheadle Pond                 | USFWS     | Finley Gray Creek Swamp  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             | 53   | 85   | 118   | 30    | 184   | 470 |    |
|                                     |           | Finley Display Pond  |      |      |      |      |      |      |      | 50   |      |      |      |      |      |      |      |      |      |             |      |      |       | 50    | 50    |     |    |
| Finley Display Pond                 | USFWS     | Finley Gray Creek Swamp  |      |      |      | 60   | 45   |      |      | 49   |      |      |      |      |      |      |      |      |      |             |      |      |       | 500   | 500   |     |    |
| Jampolsky Wetlands                  | private   | Dunn Wetland   |      |      |      |      |      |      |      |      |      |      | 500  |      |      |      |      |      |      |             |      |      | 500   | 500   |       |     |    |
| Murphy Pond                         | private   | Finley-Buford Pond   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      | 32   |       | 32    | 32    |     |    |
|                                     |           | Finley Gray Creek Swamp  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      | 182  |       | 182   | 182   |     |    |
| Schmedding Beaver Creek Swamp       | private   | Finley-Buford Pond   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      | 150   | 150   | 150   |     |    |
| St. Paul Ponds                      | ODFW      | Big Island   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             | 25   | 64   | 106   |       | 195   |     |    |
| <b>McKenzie River</b>               |           |  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      |       |       |       |     |    |
| Ellison Pond                        | private   | McKenzie Oxbow   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      |       | 110   | 110   |     |    |
| Russell Pond                        | private   | Buckhead Creek   |      |      |      |      |      |      | 350  | 150  |      |      |      |      |      |      |      |      |      |             |      |      |       |       | 500   |     |    |
|                                     |           | St. Paul Ponds   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      | 53    |       | 53    |     |    |
| Shetzline North Pond                | private   | Shetzline Pond   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      | 29   | 31    |       | 60    |     |    |
| <b>Middle Fork Willamette River</b> |           |  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      |       |       |       |     |    |
| East Ferrin Pond                    | USFS      | East Fork Minnow Pond  |      |      |      |      |      |      |      |      |      | 576  |      |      |      |      |      |      |      |             |      |      |       |       | 576   |     |    |
| Fall Creek Spillway Ponds           | ACOE      | East Fork Minnow Pond  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      | 350   |       | 350   |     |    |
|                                     |           | Shady Dell   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      | 150   |       | 150   |     |    |
| Haws Enhancement Pond               | private   | Haws Pond  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      | 47   | 86    |       | 133   |     |    |
| Hills Creek Pond                    | ACOE      | Dexter Alcove "PIT1"   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      | 507   |       | 507   |     |    |
|                                     |           | Dexter Reservoir RV Alcove "DEX3"                                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      | 620   |       | 620   |     |    |
| Hospital Imound. Pond <sup>b</sup>  | ACOE      | -----  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      | ----- | ----- | ----- |     |    |
| Lower Buckhead Ponds <sup>b</sup>   | USFS      | -----  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      | ----- | ----- | ----- |     |    |
| West Ferrin Pond                    | USFS      | Shady Dell Pond  |      |      |      |      |      |      |      |      |      | 525  |      |      |      |      |      |      |      |             |      |      |       |       | 525   |     |    |
| Wicopee Pond                        | USFS      | Dexter Reservoir Alcove "PIT1"                                   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      | 50    |       | 50    |     |    |
|                                     |           | Salt Creek Diversion Canal                                       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      |       | 128   | 128   |     |    |
| <b>Coast Fork Willamette River</b>  |           |  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      |       |       |       |     |    |
| Herman Pond                         | USFS      | Buckhead Creek   |      |      |      |      |      |      |      |      |      | 400  |      |      |      |      |      |      |      |             |      |      |       |       | 400   |     |    |
| Sprick Pond                         | private   | Coast Fork Side Channels   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      |       | 12    | 10    | 31  | 12 |
|                                     |           |  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |             |      |      |       |       |       | 65  |    |

<sup>a</sup>Oregon chub colonized these sites naturally. We removed Oregon chub from Jampolsky Wetlands in the fall of 2007 at the landowner's request. These introductions originated from the same donor source.

<sup>b</sup>These sites are habitat enhancement projects where no Oregon chub were introduced.

several habitat restoration projects have been completed to increase the quantity of habitat or enhance the suitability of habitat for Oregon chub.

In 2015, we documented 11 introduced Oregon chub populations with 500 or more individuals; five of these populations in the Mainstem Recovery Area, five in the Santiam Recovery Area, and two in the Middle Fork Willamette Recovery Area. We introduced Oregon chub into three habitats in the Mainstem Recovery Area. We moved 300 Oregon chub from Finley-Buford Pond into Fairchild Pond (150 fish) and Schmedding Beaver Creek Swamp (150 fish). We moved 500 Oregon chub from Ellis Slough and 10 Oregon chub from Labeledz Slough into Maguire Pond. St. Paul pond desiccated in the summer of 2015; we transferred Oregon chub from this location in 2014. We did not sample Wicopee Pond or Sprick Pond, which had populations greater than 500 fish in previous years.

Oregon chub introduction guidelines for establishing new populations recommend that we transfer a minimum of 500 fish, but only remove a maximum of 10% from a donor population annually to minimize impacts to the donor population. When donor populations total <5,000 fish, it takes us multiple years to achieve this target. In addition, the guidelines also state that donor stocks should be from the same subbasin as the introduction location, whenever possible.

### **Distribution of Nonnative Species**

We confirmed the presence of nonnative fish species in 33 locations containing Oregon chub in 2015. Nonnative fish were captured at 23% (5 of 21), 70% (16 of 23), and 48% (12 of 25) of the locations containing Oregon chub in the Mainstem, Santiam, and Middle Fork Willamette recovery areas, respectively. Combined with data from previous years, nonnative fish are present in 27% (9 of 34), 71% (17 of 24) and 38% (12 of 32) of the locations containing Oregon chub in the Mainstem, Santiam, and Middle Fork Willamette recovery areas, respectively. Across all Recovery Areas and combining data from previous years, nonnative fish are present in 42% (38 of 90) of known Oregon chub habitats.

In 2015 we discovered that Green Sunfish *Lepomis cyanellus* colonized one Oregon chub population in the Mainstem Willamette (Green Island) and two in the Middle Fork Willamette (Deep Muddy Slough and Dougren Slough). We are concerned about the potential for Green Sunfish piscivory on Oregon chub because Green Sunfish has a larger gape than bluegill and pumpkinseed (Scott and Crossman 1979) and have been documented consuming Gila chub *Gila intermedia* similar in size to young-of-the-year Oregon chub (Dudley and Matter 2000).

### **Other Research and Monitoring**

In addition to the monitoring outlined above, ODFW has carried out research/monitoring of Oregon chub funded by the USACE. A brief summary of these activities is included below.

## ***Floodplain Study***

In 2009, we initiated a floodplain monitoring study to assess factors that may allow Oregon chub to co-exist with nonnative fishes in connected (non-isolated) habitats (Bangs et al. 2010; 2011; 2014b). During this multi-year study, we have been assessing the effects of flow and temperature regimes on the suitability of off-channel habitats for Oregon chub (availability of aquatic vegetation and temperatures conducive for successful spawning) and effects of the timing, frequency, magnitude, and duration of connectivity on the composition of fish assemblages (native and nonnative) (Bangs et al. 2011b). We will use these data to assess the impacts of proposed floodplain restoration and reconnection projects on Oregon chub populations and their habitats. We are working to determine the combination of flows, temperatures, connectivity, and habitat modifications that will favor native fishes, including Oregon chub, over nonnative predatory fishes. Ideally, these data, when used by managers to enhance off-channel habitat conditions for Oregon chub, will contribute to the long-term recovery of the species by minimizing the inherent residual threat posed by nonnative fishes in these habitats.

An early result of the floodplain study was documenting many previously undiscovered populations of Oregon chub in habitats that are frequently connected to the floodplain in the North Santiam River, McKenzie River, and Middle Fork Willamette River. We hypothesized that movement may occur between populations, but did not have a technique to identify individual or groups of Oregon chub. In 2009 we tested the feasibility of using passive integrated transponder (PIT) tags with small minnows, using redbreast shiners *Richardsonius balteatus* as a surrogate species for Oregon chub (Bangs et al. 2011b), and demonstrated the ability to mark fish similar in size to adult Oregon chub. In 2011, we conducted a study in which we marked Oregon chub with two different sized PIT-tags (9 X 2.12 mm and 8.4 X 1.4 mm), visual implant elastomer (VIE) tags, and freeze branding (Bangs et al. 2013). We observed high survival rates (>98%) and high retention rates (>98%) with VIE and freeze brand marks in the laboratory.

In 2012, we began using VIE marks to assess Oregon chub movement *in situ*. We marked about 4,229 Oregon chub with VIE marks in the Middle Fork, McKenzie, and Santiam drainages in 2012-2014. We documented movement of six Oregon chub in the Middle Fork Willamette: three from Dougren Slough to Deep Muddy (upstream 200 m), one from Dougren Slough to Pengra Oxbow (upstream 1,200 m), and two from Dexter Dam Slough to Elijah Bristow South Slough (downstream 950 m). In the McKenzie drainage, we documented movement of two Oregon chub from Berggren Slough to McKenzie Oxbow (upstream 5,500 m) and one Oregon chub from McKenzie Oxbow to Berggren Slough (downstream 5,500 m). In 2015, we documented movement of one Oregon chub from Koenig Slough 6,500 m upstream to the Hatch Side Channels. These data show that Oregon chub can move substantial distances among habitats (e.g., at least 6.5 km). Therefore, these fish are likely capable of colonizing new or previously extirpated habitats, and gene flow among local populations may be possible under contemporary conditions. Prior to these observations, evidence of Oregon chub movements among locations was limited to colonization of previously unoccupied restoration

locations by Oregon chub (e.g., Buckhead Creek Enhancement Ponds, Finley Beaver Pond, Hospital Impoundment Pond, and lower Fall Creek Spillway Pond).

In a complementary study, the USFWS used genetic data to assess the degree of movement and gene flow among 10 populations in the Dexter – Jasper reach of the Middle Fork Willamette River (DeHaan et al. 2015). This reach was selected based on the varying degree of hydrologic connectivity the populations have to the adjacent river, the number of known habitats, and our findings that movement was occurring within this reach. Genetic studies can provide information from a broader time scale than physical marking studies and can provide information about gene flow among local populations. Oregon chub in the Dexter-Jasper reach represent a single population with high levels of gene flow among sample locations (DeHaan et al. 2015). In addition, the lack of genetic differentiation among locations precluded the ability to identify individual migrants among locations. These data suggest that gene flow may be high among populations in other areas (e.g., the Middle Fork Willamette above Lookout Point Reservoir), in basins where we have documented populations with frequent connectivity to the river (e.g., the Molalla, North Santiam, and McKenzie rivers), and in areas where we have documented movement based on physical marks.

### **Status of Oregon Chub Relative to PDM Criteria**

The PDM identifies triggers to increase monitoring and track the status of Oregon chub based on population abundance and distribution, the distribution of nonnative species, and habitat status. In addition, the PDM identifies criteria to determine the conclusion of post-delisting monitoring when Oregon chub monitoring is no longer necessary. There are currently 43 Oregon chub populations with  $\geq 500$  individuals; 15 of these populations were in the Santiam Recovery Area, 11 in the Mainstem Willamette Recovery Area, and 17 in the Middle Fork Willamette Recovery Area. Nonnative fish are present in 42% of the habitats containing Oregon chub. While we found a new nonnative predatory fish invading Oregon chub habitats, its current distribution is limited to 6% of the Middle Fork Willamette Recovery Area and 3% of the Mainstem Willamette Recovery Area. There are currently 60 habitats that contain Oregon chub and frequently connect to adjacent rivers. There have been no additional complete reservoir drawdowns or 50-year flood events, which are identified as triggers for additional monitoring by the PDM. Oregon chub are currently exceeding the PDM criteria and remain secure without the protection of the ESA.

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## APPENDIX A

### Fish species and habitat characteristics at 2015 Oregon chub survey locations

Locations are sorted by subbasin then listed alphabetically by location name.

<sup>1</sup> Vegetation types are expressed as a percentage of the total surface area of the locations. The sum of all vegetation types cannot exceed 100 percent.

<sup>2</sup> Salmonid codes: CO= coho salmon *Oncorhynchus kisutch*; CH= chinook salmon *O. tshawytscha*; CT= cutthroat trout *O. clarki*; RB= rainbow trout *O. mykiss*, ST= steelhead *O. mykiss*, TF= unknown trout fry.

Appendix A (continued).

**COAST FORK WILLAMETTE RIVER BASIN**

|           |                                       |                    |              |         |
|-----------|---------------------------------------|--------------------|--------------|---------|
| Site Name | <b>COAST FORK WILLAMETTE SIDE CHN</b> | Map Code           | <b>CF11M</b> |         |
| Basin     | COAST FORK WILLAMETTE RIVER           | Sampling Date      | 6/7/2015     |         |
| Subbasin  |                                       | Location: Zone 10T | 498954       | 4857992 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 1344 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.4  | Submergent                                      | 60 |
| Maximum Depth (m)       | 1    | Emergent  | 20 |
| Water Temperature (C)   | 18   | Floating  | 0  |
| Percent Silt / Organics | 25   | Algae   | 10 |
|                         |      | <i>Total</i>                                    | 90 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>244</b> |
| Cottids                 | 351        |
| Speckled Dace           | 1093       |
| Redside Shiners         | 198        |
| Northern Pikeminnows    | 1089       |
| Largescale Suckers      | 7          |
| Sand Rollers            | 924        |
| Threespine Sticklebacks | 873        |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 |            |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |    |
|----------------------|----|
| Western Mosquitofish | 20 |
| Bullheads            | 1  |
| Common Carp          |    |
| Bluegills            |    |
| Largemouth Bass      |    |
| Pumpkinseeds         | 1  |
| Crappies             |    |
| Smallmouth Bass      |    |
| Banded Killifish     |    |

**Other:** YP=3

**NOTE:** POPULATION ESTIMATE, FLOAT DS FROM LYNX

|           |                             |                    |               |         |
|-----------|-----------------------------|--------------------|---------------|---------|
| Site Name | <b>LYNX HOLLOW</b>          | Map Code           | <b>LYNX1L</b> |         |
| Basin     | COAST FORK WILLAMETTE RIVER | Sampling Date      | 6/7/2015      |         |
| Subbasin  |                             | Location: Zone 10T | 498103        | 4856295 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 4780 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.25 | Submergent                                      | 20 |
| Maximum Depth (m)       | 0.5  | Emergent  | 15 |
| Water Temperature (C)   | 18   | Floating  | 0  |
| Percent Silt / Organics | 60   | Algae   | 10 |
|                         |      | <i>Total</i>                                    | 45 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 | 1        |
| Speckled Dace           |          |
| Redside Shiners         | 2        |
| Northern Pikeminnows    |          |
| Largescale Suckers      |          |
| Sand Rollers            | 15       |
| Threespine Sticklebacks |          |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |  |
|----------------------|--|
| Western Mosquitofish |  |
| Bullheads            |  |
| Common Carp          |  |
| Bluegills            |  |
| Largemouth Bass      |  |
| Pumpkinseeds         |  |
| Crappies             |  |
| Smallmouth Bass      |  |
| Banded Killifish     |  |

**Other:** YP=1

**NOTE:** STATE PARK GREENWAY SITE, P/A



Appendix A (continued).

COAST FORK WILLAMETTE RIVER BASIN

|           |                                     |                    |               |         |
|-----------|-------------------------------------|--------------------|---------------|---------|
| Site Name | <b>LYNX HOLLOW BOAT RAMP SLOUGH</b> | Map Code           | <b>LYNX2C</b> |         |
| Basin     | COAST FORK WILLAMETTE RIVER         | Sampling Date      | 6/7/2015      |         |
| Subbasin  |                                     | Location: Zone 10T | 498450        | 4856645 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 4780 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.5  | Submergent                                      | 25 |
| Maximum Depth (m)       | 1.5  | Emergent  | 30 |
| Water Temperature (C)   | 16   | Floating  | 0  |
| Percent Silt / Organics | 40   | Algae   | 15 |
|                         |      | <i>Total</i>                                    | 70 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 | 8        |
| Speckled Dace           |          |
| Redside Shiners         |          |
| Northern Pikeminnows    | 1        |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks | 9        |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |   |
|----------------------|---|
| Western Mosquitofish |   |
| Bullheads            | 4 |
| Common Carp          |   |
| Bluegills            | 1 |
| Largemouth Bass      |   |
| Pumpkinseeds         | 1 |
| Crappies             |   |
| Smallmouth Bass      |   |
| Banded Killifish     |   |

**Other:**

**NOTE:** NORTH OF MAIN LYNX HOLLOW AREA

Appendix A (continued).

LOWER WILLAMETTE RIVER BASIN

|           |                                |                    |              |         |
|-----------|--------------------------------|--------------------|--------------|---------|
| Site Name | <b>ANKENY NWR-WILLOW MARSH</b> | Map Code           | <b>WM1M*</b> |         |
| Basin     | LOWER WILLAMETTE RIVER         | Sampling Date      | 9/24/2015    |         |
| Subbasin  | ANKENY                         | Location: Zone 10T | 494684       | 4958441 |

|                         |       |   |     |  |
|-------------------------|-------|---|-----|--|
| Surface Area (m2)       | 25120 | <b>Types of aquatic vegetation <sup>1</sup></b> |     |  |
| Average Depth (m)       | 0.8   | Submergent                                      | 50  |  |
| Maximum Depth (m)       | 1.6   | Emergent  | 25  |  |
| Water Temperature (C)   | 21    | Floating  | 10  |  |
| Percent Silt / Organics | 100   | Algae   | 15  |  |
|                         |       | <i>Total</i>                                    | 100 |  |

**Native Fish Species Collected:**

|                         |              |
|-------------------------|--------------|
| Oregon Chub             | <b>16925</b> |
| Cottids                 |              |
| Speckled Dace           |              |
| Redside Shiners         |              |
| Northern Pikeminnows    |              |
| Largescale Suckers      |              |
| Sand Rollers            |              |
| Threespine Sticklebacks | 25           |
| Salmonids <sup>2</sup>  |              |
| Lamprey                 |              |
| Chiselmouth             |              |

**Non-native Fish Species Collected:**

|                      |       |
|----------------------|-------|
| Western Mosquitofish | 10000 |
| Bullheads            |       |
| Common Carp          |       |
| Bluegills            |       |
| Largemouth Bass      |       |
| Pumpkinseeds         |       |
| Crappies             |       |
| Smallmouth Bass      |       |
| Banded Killifish     |       |

**Other:**

**NOTE:** REINTRO, MANY CHUB WITH PARASITES

|           |                        |                    |               |         |
|-----------|------------------------|--------------------|---------------|---------|
| Site Name | <b>COUNCIL CREEK</b>   | Map Code           | <b>CNCL1*</b> |         |
| Basin     | LOWER WILLAMETTE RIVER | Sampling Date      | 9/17/2015     |         |
| Subbasin  | TUALATIN RIVER         | Location: Zone 10T | 496362        | 5041391 |

|                         |     |   |    |  |
|-------------------------|-----|---|----|--|
| Surface Area (m2)       | 800 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |  |
| Average Depth (m)       | 1.2 | Submergent                                      | 10 |  |
| Maximum Depth (m)       | 2   | Emergent  | 50 |  |
| Water Temperature (C)   | 15  | Floating  | 10 |  |
| Percent Silt / Organics | 80  | Algae   | 10 |  |
|                         |     | <i>Total</i>                                    | 80 |  |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 |          |
| Speckled Dace           |          |
| Redside Shiners         |          |
| Northern Pikeminnows    |          |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks |          |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |  |
|----------------------|--|
| Western Mosquitofish |  |
| Bullheads            |  |
| Common Carp          |  |
| Bluegills            |  |
| Largemouth Bass      |  |
| Pumpkinseeds         |  |
| Crappies             |  |
| Smallmouth Bass      |  |
| Banded Killifish     |  |

**Other:** NO FISH

**NOTE:** P/A, DECENT LOOKING HABITAT

Appendix A (continued).

**LOWER WILLAMETTE RIVER BASIN**

|           |                        |                    |               |         |
|-----------|------------------------|--------------------|---------------|---------|
| Site Name | <b>COUNCIL CREEK</b>   | Map Code           | <b>CNCL2*</b> |         |
| Basin     | LOWER WILLAMETTE RIVER | Sampling Date      | 9/17/2015     |         |
| Subbasin  | TUALATIN RIVER         | Location: Zone 10T | 495373        | 5041520 |

|                         |     |   |    |
|-------------------------|-----|---|----|
| Surface Area (m2)       | 600 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.8 | Submergent                                      | 10 |
| Maximum Depth (m)       | 1.7 | Emergent  | 50 |
| Water Temperature (C)   | 14  | Floating  | 10 |
| Percent Silt / Organics | 80  | Algae   | 10 |
|                         |     | <i>Total</i>                                    | 80 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 |          |
| Speckled Dace           |          |
| Redside Shiners         |          |
| Northern Pikeminnows    |          |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks |          |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |   |
|----------------------|---|
| Western Mosquitofish | 2 |
| Bullheads            |   |
| Common Carp          |   |
| Bluegills            |   |
| Largemouth Bass      |   |
| Pumpkinseeds         |   |
| Crappies             |   |
| Smallmouth Bass      |   |
| Banded Killifish     |   |

**Other:**

**NOTE:** P/A, DECENT LOOKING HABITAT

|           |                        |                    |                   |         |
|-----------|------------------------|--------------------|-------------------|---------|
| Site Name | <b>ELLIS SLOUGH</b>    | Map Code           | <b>MOLALLA4A*</b> |         |
| Basin     | LOWER WILLAMETTE RIVER | Sampling Date      | 9/15/2015         |         |
| Subbasin  | MOLALLA RIVER          | Location: Zone 10T | 537042            | 4994450 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 2000 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.5  | Submergent                                      | 30 |
| Maximum Depth (m)       | 1.4  | Emergent  | 20 |
| Water Temperature (C)   | 13   | Floating  | 10 |
| Percent Silt / Organics | 10   | Algae   | 10 |
|                         |      | <i>Total</i>                                    | 70 |

**Native Fish Species Collected:**

|                         |             |
|-------------------------|-------------|
| Oregon Chub             | <b>6577</b> |
| Cottids                 | 8           |
| Speckled Dace           | 441         |
| Redside Shiners         | 10          |
| Northern Pikeminnows    | 2           |
| Largescale Suckers      |             |
| Sand Rollers            |             |
| Threespine Sticklebacks |             |
| Salmonids <sup>2</sup>  |             |
| Lamprey                 |             |
| Chiselmouth             |             |

**Non-native Fish Species Collected:**

|                      |  |
|----------------------|--|
| Western Mosquitofish |  |
| Bullheads            |  |
| Common Carp          |  |
| Bluegills            |  |
| Largemouth Bass      |  |
| Pumpkinseeds         |  |
| Crappies             |  |
| Smallmouth Bass      |  |
| Banded Killifish     |  |

**Other:**

**NOTE:** WEYERHAUSER PROPERTY, POP EST

Appendix A (continued).

**LOWER WILLAMETTE RIVER BASIN**

|           |                           |                    |               |         |
|-----------|---------------------------|--------------------|---------------|---------|
| Site Name | <b>FEYRER PARK SLOUGH</b> | Map Code           | <b>FEY1B*</b> |         |
| Basin     | LOWER WILLAMETTE RIVER    | Sampling Date      | 9/15/2015     |         |
| Subbasin  | MOLALLA RIVER             | Location: Zone 10T | 536785        | 4998233 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 500  | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.5  | Submergent                                      | 10 |
| Maximum Depth (m)       | 0.75 | Emergent  | 15 |
| Water Temperature (C)   |      | Floating  | 0  |
| Percent Silt / Organics | 50   | Algae   | 5  |
|                         |      | <i>Total</i>                                    | 30 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 |          |
| Speckled Dace           | 19       |
| Redside Shiners         | 15       |
| Northern Pikeminnows    | 10       |
| Largescale Suckers      | 3        |
| Sand Rollers            |          |
| Threespine Sticklebacks |          |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |  |
|----------------------|--|
| Western Mosquitofish |  |
| Bullheads            |  |
| Common Carp          |  |
| Bluegills            |  |
| Largemouth Bass      |  |
| Pumpkinseeds         |  |
| Crappies             |  |
| Smallmouth Bass      |  |
| Banded Killifish     |  |

**Other:**

**NOTE:** P/A, SLOUGH ACROSS RIVER FROM PARK

|           |                                |                    |                   |         |
|-----------|--------------------------------|--------------------|-------------------|---------|
| Site Name | <b>HWY 211 BRIDGE CROSSING</b> | Map Code           | <b>MOLALLA2A*</b> |         |
| Basin     | LOWER WILLAMETTE RIVER         | Sampling Date      | 9/16/2015         |         |
| Subbasin  | MOLALLA RIVER                  | Location: Zone 10T | 536671            | 5000800 |

|                         |     |   |    |
|-------------------------|-----|---|----|
| Surface Area (m2)       | 600 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.5 | Submergent                                      | 5  |
| Maximum Depth (m)       | 1   | Emergent  | 10 |
| Water Temperature (C)   | 16  | Floating  | 0  |
| Percent Silt / Organics | 70  | Algae   | 10 |
|                         |     | <i>Total</i>                                    | 25 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 | 2        |
| Speckled Dace           |          |
| Redside Shiners         | 18       |
| Northern Pikeminnows    |          |
| Largescale Suckers      | 13       |
| Sand Rollers            |          |
| Threespine Sticklebacks |          |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |    |
|----------------------|----|
| Western Mosquitofish |    |
| Bullheads            |    |
| Common Carp          |    |
| Bluegills            | 41 |
| Largemouth Bass      |    |
| Pumpkinseeds         | 48 |
| Crappies             |    |
| Smallmouth Bass      |    |
| Banded Killifish     |    |

**Other:**

**NOTE:** BACKWATER ON E END OF BRIDGE

Appendix A (continued).

**LOWER WILLAMETTE RIVER BASIN**

|           |                        |                    |                |         |
|-----------|------------------------|--------------------|----------------|---------|
| Site Name | <b>LABEDZ SLOUGH</b>   | Map Code           | <b>MILK1B*</b> |         |
| Basin     | LOWER WILLAMETTE RIVER | Sampling Date      | 9/15/2015      |         |
| Subbasin  | MOLALLA RIVER          | Location: Zone 10T | 529098         | 5009134 |

|                         |      |   |     |
|-------------------------|------|---|-----|
| Surface Area (m2)       | 2250 | <b>Types of aquatic vegetation <sup>1</sup></b> |     |
| Average Depth (m)       | 0.5  | Submergent                                      | 50  |
| Maximum Depth (m)       | 1.2  | Emergent  | 20  |
| Water Temperature (C)   |      | Floating  | 10  |
| Percent Silt / Organics | 100  | Algae   | 20  |
|                         |      | <i>Total</i>                                    | 100 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>101</b> |
| Cottids                 | 4          |
| Speckled Dace           | 4          |
| Redside Shiners         | 666        |
| Northern Pikeminnows    | 513        |
| Largescale Suckers      | 2          |
| Sand Rollers            |            |
| Threespine Sticklebacks | 1827       |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 |            |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** MILK CREEK, OLD OXBOW CHANNEL, POP EST

|           |                        |                    |              |         |
|-----------|------------------------|--------------------|--------------|---------|
| Site Name | <b>MAGUIRE POND</b>    | Map Code           | <b>MP1A*</b> |         |
| Basin     | LOWER WILLAMETTE RIVER | Sampling Date      | 9/16/2015    |         |
| Subbasin  |                        | Location: Zone 10T | 524293       | 5017115 |

|                         |     |   |    |
|-------------------------|-----|---|----|
| Surface Area (m2)       | 844 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 1.5 | Submergent                                      | 30 |
| Maximum Depth (m)       | 3.9 | Emergent  | 30 |
| Water Temperature (C)   |     | Floating  | 0  |
| Percent Silt / Organics | 100 | Algae   | 5  |
|                         |     | <i>Total</i>                                    | 65 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>510</b> |
| Cottids                 | 50         |
| Speckled Dace           | 50         |
| Redside Shiners         | 50         |
| Northern Pikeminnows    | 50         |
| Largescale Suckers      | 20         |
| Sand Rollers            |            |
| Threespine Sticklebacks |            |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 |            |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** INTRODUCTION (500 ELLIS, 10 LABEDZ)

Appendix A (continued).

LOWER WILLAMETTE RIVER BASIN

|           |                         |                    |               |         |
|-----------|-------------------------|--------------------|---------------|---------|
| Site Name | <b>MCCRAE RESERVOIR</b> | Map Code           | <b>HART1B</b> |         |
| Basin     | LOWER WILLAMETTE RIVER  | Sampling Date      | 6/11/2015     |         |
| Subbasin  | ASH CREEK               | Location: Zone 10T | 478031        | 4967606 |

|                         |      |   |     |
|-------------------------|------|---|-----|
| Surface Area (m2)       | 3000 | <b>Types of aquatic vegetation <sup>1</sup></b> |     |
| Average Depth (m)       | 1    | Submergent                                      | 80  |
| Maximum Depth (m)       | 2.2  | Emergent  | 10  |
| Water Temperature (C)   | 18   | Floating  | 0   |
| Percent Silt / Organics | 100  | Algae   | 10  |
|                         |      | <i>Total</i>                                    | 100 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>208</b> |
| Cottids                 |            |
| Speckled Dace           |            |
| Redside Shiners         |            |
| Northern Pikeminnows    |            |
| Largescale Suckers      |            |
| Sand Rollers            |            |
| Threespine Sticklebacks |            |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 |            |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** 2013 INTRO, 8 ADULT, REMAIN LARVAL

|           |                             |                    |                  |         |
|-----------|-----------------------------|--------------------|------------------|---------|
| Site Name | <b>MOLALLA SIDE CHANNEL</b> | Map Code           | <b>MOLALLA5*</b> |         |
| Basin     | LOWER WILLAMETTE RIVER      | Sampling Date      | 9/16/2015        |         |
| Subbasin  | MOLALLA RIVER               | Location: Zone 10T | 536539           | 5000655 |

|                         |     |   |    |
|-------------------------|-----|---|----|
| Surface Area (m2)       | 300 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.2 | Submergent                                      | 5  |
| Maximum Depth (m)       | 0.5 | Emergent  | 15 |
| Water Temperature (C)   | 14  | Floating  | 0  |
| Percent Silt / Organics | 20  | Algae   | 10 |
|                         |     | <i>Total</i>                                    | 30 |

**Native Fish Species Collected:**

|                           |          |
|---------------------------|----------|
| Oregon Chub               | <b>0</b> |
| Cottids                   | 12       |
| Speckled Dace             | 21       |
| Redside Shiners           | 23       |
| Northern Pikeminnows      | 9        |
| Largescale Suckers        | 2        |
| Sand Rollers              |          |
| Threespine Sticklebacks   |          |
| Salmonids <sup>2</sup> CO | 5        |
| Lamprey                   |          |
| Chiselmouth               |          |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** FLOWING CREEK SOUTH OF BRIDGE

Appendix A (continued).

LOWER WILLAMETTE RIVER BASIN

|           |                          |                    |                 |         |
|-----------|--------------------------|--------------------|-----------------|---------|
| Site Name | <b>NORTH BUDEAU POND</b> | Map Code           | <b>BUDEAU2D</b> |         |
| Basin     | LOWER WILLAMETTE RIVER   | Sampling Date      | 5/11/2015       |         |
| Subbasin  | MILL CREEK               | Location: Zone 10T | 503912          | 4962973 |

|                         |       |
|-------------------------|-------|
| Surface Area (m2)       | 15730 |
| Average Depth (m)       | 1     |
| Maximum Depth (m)       | 1.75  |
| Water Temperature (C)   | 14    |
| Percent Silt / Organics | 65    |

|   |    |
|---|----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Submergent                                      | 60 |
| Emergent  | 30 |
| Floating  | 0  |
| Algae   | 0  |
| <i>Total</i>                                    | 90 |

**Native Fish Species Collected:**

|                         |              |
|-------------------------|--------------|
| Oregon Chub             | <b>11256</b> |
| Cottids                 |              |
| Speckled Dace           |              |
| Redside Shiners         |              |
| Northern Pikeminnows    |              |
| Largescale Suckers      |              |
| Sand Rollers            |              |
| Threespine Sticklebacks |              |
| Salmonids <sup>2</sup>  |              |
| Lamprey                 |              |
| Chiselmouth             |              |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** POPULATION ESTIMATE, 2010 INTRODUCTION

|           |                          |                    |                 |         |
|-----------|--------------------------|--------------------|-----------------|---------|
| Site Name | <b>SOUTH BUDEAU POND</b> | Map Code           | <b>BUDEAU1D</b> |         |
| Basin     | LOWER WILLAMETTE RIVER   | Sampling Date      | 5/11/2015       |         |
| Subbasin  | MILL CREEK               | Location: Zone 10T | 503938          | 4962957 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 9264 |
| Average Depth (m)       | 1    |
| Maximum Depth (m)       | 2    |
| Water Temperature (C)   | 14   |
| Percent Silt / Organics | 90   |

|   |     |
|---|-----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |     |
| Submergent                                      | 15  |
| Emergent  | 80  |
| Floating  | 0   |
| Algae   | 5   |
| <i>Total</i>                                    | 100 |

**Native Fish Species Collected:**

|                         |             |
|-------------------------|-------------|
| Oregon Chub             | <b>6176</b> |
| Cottids                 |             |
| Speckled Dace           |             |
| Redside Shiners         |             |
| Northern Pikeminnows    |             |
| Largescale Suckers      |             |
| Sand Rollers            |             |
| Threespine Sticklebacks |             |
| Salmonids <sup>2</sup>  |             |
| Lamprey                 |             |
| Chiselmouth             |             |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** POPULATION ESTIMATE, 2010 INTRODUCTION

Appendix A (continued).

LOWER WILLAMETTE RIVER BASIN

|           |                                  |                    |                 |         |
|-----------|----------------------------------|--------------------|-----------------|---------|
| Site Name | <b>ST. PAUL PONDS (10 PONDS)</b> | Map Code           | <b>STPAUL1H</b> |         |
| Basin     | LOWER WILLAMETTE RIVER           | Sampling Date      | 7/1/2015        |         |
| Subbasin  |                                  | Location: Zone 10T | 500165          | 5008900 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 3000 |
| Average Depth (m)       | 0    |
| Maximum Depth (m)       | 0    |
| Water Temperature (C)   | 20   |
| Percent Silt / Organics | 100  |

**Types of aquatic vegetation <sup>1</sup>**

- Submergent
- Emergent
- Floating
- Algae

*Total*

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 |          |
| Speckled Dace           |          |
| Redside Shiners         |          |
| Northern Pikeminnows    |          |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks |          |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

- Western Mosquitofish
- Bullheads
- Common Carp
- Bluegills
- Largemouth Bass
- Pumpkinseeds
- Crappies
- Smallmouth Bass
- Banded Killifish

**Other:** NO FISH

**NOTE:** SITE DESSICATED SUMMER 2015

|           |                        |                    |               |         |
|-----------|------------------------|--------------------|---------------|---------|
| Site Name | <b>TURNER CREEK</b>    | Map Code           | <b>TURN1*</b> |         |
| Basin     | LOWER WILLAMETTE RIVER | Sampling Date      | 9/17/2015     |         |
| Subbasin  | TUALATIN RIVER         | Location: Zone 10T | 503268        | 5040002 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 300  |
| Average Depth (m)       | 0.3  |
| Maximum Depth (m)       | 1.1  |
| Water Temperature (C)   | 16.5 |
| Percent Silt / Organics | 70   |

**Types of aquatic vegetation <sup>1</sup>**

- Submergent 20
- Emergent 20
- Floating 25
- Algae 20

*Total* 85

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 |          |
| Speckled Dace           | 2        |
| Redside Shiners         |          |
| Northern Pikeminnows    |          |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks | 10       |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

- Western Mosquitofish 56
- Bullheads
- Common Carp
- Bluegills
- Largemouth Bass
- Pumpkinseeds
- Crappies
- Smallmouth Bass
- Banded Killifish

**Other:**

**NOTE:** DIPNET, DECENT LOOKING HABITAT



Appendix A (continued).

**LOWER WILLAMETTE RIVER BASIN**

|           |                        |                |              |                |
|-----------|------------------------|----------------|--------------|----------------|
| Site Name | <b>WAPATO CREEK</b>    | Map Code       | <b>WPT1*</b> |                |
| Basin     | LOWER WILLAMETTE RIVER | Sampling Date  | 9/17/2015    |                |
| Subbasin  | TUALATIN RIVER         | Location: Zone | 10T          | 490217 5031691 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 1000 |
| Average Depth (m)       | 0.3  |
| Maximum Depth (m)       | 1.1  |
| Water Temperature (C)   | 16.5 |
| Percent Silt / Organics | 50   |

**Types of aquatic vegetation <sup>1</sup>**

|              |    |
|--------------|----|
| Submergent   | 10 |
| Emergent     | 10 |
| Floating     | 10 |
| Algae        | 10 |
| <i>Total</i> | 40 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 |          |
| Speckled Dace           |          |
| Redside Shiners         |          |
| Northern Pikeminnows    |          |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks |          |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |    |
|----------------------|----|
| Western Mosquitofish | 10 |
| Bullheads            |    |
| Common Carp          |    |
| Bluegills            | 2  |
| Largemouth Bass      |    |
| Pumpkinseeds         |    |
| Crappies             |    |
| Smallmouth Bass      |    |
| Banded Killifish     |    |

**Other:**

**NOTE:** P/A, NEAR USFWS REFUGE, WAPATO LAKE BED

Appendix A (continued).

**MCKENZIE RIVER BASIN**

|           |                                     |                    |                 |         |
|-----------|-------------------------------------|--------------------|-----------------|---------|
| Site Name | <b>BERGGREN (HUNSAKER) PROPERTY</b> | Map Code           | <b>HUNS1-3F</b> |         |
| Basin     | MCKENZIE RIVER                      | Sampling Date      | 7/6/2015        |         |
| Subbasin  |                                     | Location: Zone 10T | 508092          | 4878827 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 1800 |
| Average Depth (m)       | 0.3  |
| Maximum Depth (m)       | 1.25 |
| Water Temperature (C)   | 21   |
| Percent Silt / Organics | 10   |

|   |    |
|---|----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Submergent                                      | 35 |
| Emergent  | 5  |
| Floating  | 0  |
| Algae   | 0  |
| <i>Total</i>                                    | 40 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>753</b> |
| Cottids                 | 11         |
| Speckled Dace           | 86         |
| Redside Shiners         | 459        |
| Northern Pikeminnows    | 2          |
| Largescale Suckers      | 1          |
| Sand Rollers            |            |
| Threespine Sticklebacks | 1407       |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 |            |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** POP EST, VIE RED

|           |                   |                    |                |         |
|-----------|-------------------|--------------------|----------------|---------|
| Site Name | <b>BIG ISLAND</b> | Map Code           | <b>BIG1-6N</b> |         |
| Basin     | MCKENZIE RIVER    | Sampling Date      | 6/26/2015      |         |
| Subbasin  |                   | Location: Zone 10T | 507253         | 4879014 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 3180 |
| Average Depth (m)       | 0.3  |
| Maximum Depth (m)       | 2.5  |
| Water Temperature (C)   | 22   |
| Percent Silt / Organics | 50   |

|   |    |
|---|----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Submergent                                      | 50 |
| Emergent  | 40 |
| Floating  | 0  |
| Algae   | 1  |
| <i>Total</i>                                    | 91 |

**Native Fish Species Collected:**

|                         |             |
|-------------------------|-------------|
| Oregon Chub             | <b>2160</b> |
| Cottids                 | 784         |
| Speckled Dace           | 1381        |
| Redside Shiners         | 1478        |
| Northern Pikeminnows    | 2           |
| Largescale Suckers      | 14          |
| Sand Rollers            |             |
| Threespine Sticklebacks | 11284       |
| Salmonids <sup>2</sup>  |             |
| Lamprey                 | 1           |
| Chiselmouth             |             |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** POPULATION ESTIMATE

Appendix A (continued).

**MCKENZIE RIVER BASIN**

|           |                                  |                    |                |
|-----------|----------------------------------|--------------------|----------------|
| Site Name | <b>GREEN ISLAND CARP POND NE</b> | Map Code           | <b>GREEN7B</b> |
| Basin     | MCKENZIE RIVER                   | Sampling Date      | 7/29/2015      |
| Subbasin  |                                  | Location: Zone 10T | 491661 4887445 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 6000 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 1.5  | Submergent                                      | 30 |
| Maximum Depth (m)       | 4    | Emergent  | 15 |
| Water Temperature (C)   | 25   | Floating  | 0  |
| Percent Silt / Organics | 20   | Algae   | 5  |
|                         |      | <i>Total</i>                                    | 50 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 |          |
| Speckled Dace           |          |
| Redside Shiners         |          |
| Northern Pikeminnows    |          |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks |          |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |      |
|----------------------|------|
| Western Mosquitofish | 1000 |
| Bullheads            | 1    |
| Common Carp          |      |
| Bluegills            | 12   |
| Largemouth Bass      | 3    |
| Pumpkinseeds         |      |
| Crappies             |      |
| Smallmouth Bass      |      |
| Banded Killifish     |      |

**Other:** GRN=933

**NOTE:** MCKENZIE RIVER TRUST RESTORATION SITE

|           |                                  |                    |                |
|-----------|----------------------------------|--------------------|----------------|
| Site Name | <b>GREEN ISLAND CARP POND NW</b> | Map Code           | <b>GREEN6B</b> |
| Basin     | MCKENZIE RIVER                   | Sampling Date      | 7/29/2015      |
| Subbasin  |                                  | Location: Zone 10T | 491539 4887461 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 7500 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 1.5  | Submergent                                      | 30 |
| Maximum Depth (m)       | 4    | Emergent  | 15 |
| Water Temperature (C)   | 25   | Floating  | 0  |
| Percent Silt / Organics | 20   | Algae   | 5  |
|                         |      | <i>Total</i>                                    | 50 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 |          |
| Speckled Dace           |          |
| Redside Shiners         |          |
| Northern Pikeminnows    |          |
| Largescale Suckers      | 2        |
| Sand Rollers            |          |
| Threespine Sticklebacks | 1        |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |      |
|----------------------|------|
| Western Mosquitofish | 1000 |
| Bullheads            |      |
| Common Carp          |      |
| Bluegills            | 16   |
| Largemouth Bass      | 46   |
| Pumpkinseeds         |      |
| Crappies             |      |
| Smallmouth Bass      |      |
| Banded Killifish     |      |

**Other:** YP1,GN1187

**NOTE:** MCKENZIE RIVER TRUST RESTORATION SITE

Appendix A (continued).

**MCKENZIE RIVER BASIN**

|           |                                     |                    |                |         |
|-----------|-------------------------------------|--------------------|----------------|---------|
| Site Name | <b>GREEN ISLAND CARP POND SOUTH</b> | Map Code           | <b>GREEN8B</b> |         |
| Basin     | MCKENZIE RIVER                      | Sampling Date      | 7/29/2015      |         |
| Subbasin  |                                     | Location: Zone 10T | 491626         | 4887293 |

|                         |       |   |    |
|-------------------------|-------|---|----|
| Surface Area (m2)       | 22500 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 1.5   | Submergent                                      | 40 |
| Maximum Depth (m)       | 4     | Emergent  | 20 |
| Water Temperature (C)   | 25    | Floating  | 5  |
| Percent Silt / Organics | 20    | Algae   | 10 |
|                         |       | <i>Total</i>                                    | 75 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 | 4        |
| Speckled Dace           |          |
| Redside Shiners         |          |
| Northern Pikeminnows    | 4        |
| Largescale Suckers      | 2        |
| Sand Rollers            |          |
| Threespine Sticklebacks | 12       |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |      |
|----------------------|------|
| Western Mosquitofish | 1000 |
| Bullheads            |      |
| Common Carp          |      |
| Bluegills            | 20   |
| Largemouth Bass      | 10   |
| Pumpkinseeds         |      |
| Crappies             |      |
| Smallmouth Bass      |      |
| Banded Killifish     |      |

**Other:** GN361

**NOTE:** MCKENZIE RIVER TRUST RESTORATION SITE

|           |                                       |                    |                |         |
|-----------|---------------------------------------|--------------------|----------------|---------|
| Site Name | <b>GREEN ISLAND CARP SOUTH CHANNE</b> | Map Code           | <b>GREEN9A</b> |         |
| Basin     | MCKENZIE RIVER                        | Sampling Date      | 6/29/2015      |         |
| Subbasin  |                                       | Location: Zone 10T | 491565         | 4886978 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 2000 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.5  | Submergent                                      | 10 |
| Maximum Depth (m)       | 1.2  | Emergent  | 20 |
| Water Temperature (C)   | 25   | Floating  | 0  |
| Percent Silt / Organics | 10   | Algae   | 10 |
|                         |      | <i>Total</i>                                    | 40 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 | 3        |
| Speckled Dace           |          |
| Redside Shiners         | 1        |
| Northern Pikeminnows    |          |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks |          |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |     |
|----------------------|-----|
| Western Mosquitofish | 100 |
| Bullheads            |     |
| Common Carp          |     |
| Bluegills            |     |
| Largemouth Bass      | 407 |
| Pumpkinseeds         |     |
| Crappies             |     |
| Smallmouth Bass      |     |
| Banded Killifish     |     |

**Other:** GREEN=27

**NOTE:** MCKENZIE RIVER TRUST RESTORATION SITE

Appendix A (continued).

**MCKENZIE RIVER BASIN**

|           |                                      |                    |                |         |
|-----------|--------------------------------------|--------------------|----------------|---------|
| Site Name | <b>GREEN ISLAND MELEVIN CROSSING</b> | Map Code           | <b>GREEN5I</b> |         |
| Basin     | MCKENZIE RIVER                       | Sampling Date      | 7/30/2015      |         |
| Subbasin  |                                      | Location: Zone 10T | 491894         | 4887617 |

|                         |       |   |    |
|-------------------------|-------|---|----|
| Surface Area (m2)       | 12000 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.75  | Submergent                                      | 45 |
| Maximum Depth (m)       | 2     | Emergent  | 0  |
| Water Temperature (C)   | 17    | Floating  | 20 |
| Percent Silt / Organics | 40    | Algae   | 5  |
|                         |       | <i>Total</i>                                    | 70 |

**Native Fish Species Collected:**

|                         |           |
|-------------------------|-----------|
| Oregon Chub             | <b>22</b> |
| Cottids                 |           |
| Speckled Dace           |           |
| Redside Shiners         |           |
| Northern Pikeminnows    |           |
| Largescale Suckers      |           |
| Sand Rollers            |           |
| Threespine Sticklebacks | 800       |
| Salmonids <sup>2</sup>  |           |
| Lamprey                 |           |
| Chiselmouth             |           |

**Non-native Fish Species Collected:**

|                      |      |
|----------------------|------|
| Western Mosquitofish | 1000 |
| Bullheads            |      |
| Common Carp          |      |
| Bluegills            |      |
| Largemouth Bass      |      |
| Pumpkinseeds         |      |
| Crappies             |      |
| Smallmouth Bass      |      |
| Banded Killifish     |      |

**Other:** GREEN=40

**NOTE:** MCKENZIE RIVER TRUST PROPERTY & PRIVATE

|           |                                    |                    |                 |         |
|-----------|------------------------------------|--------------------|-----------------|---------|
| Site Name | <b>MCKENZIE EZELL NORTH SLOUGH</b> | Map Code           | <b>EZELL1D*</b> |         |
| Basin     | MCKENZIE RIVER                     | Sampling Date      | 9/12/2015       |         |
| Subbasin  |                                    | Location: Zone 10T | 506171          | 4879648 |

|                         |      |   |     |
|-------------------------|------|---|-----|
| Surface Area (m2)       | 1300 | <b>Types of aquatic vegetation <sup>1</sup></b> |     |
| Average Depth (m)       | 0.5  | Submergent                                      | 40  |
| Maximum Depth (m)       | 1    | Emergent  | 40  |
| Water Temperature (C)   |      | Floating  | 10  |
| Percent Silt / Organics | 100  | Algae   | 10  |
|                         |      | <i>Total</i>                                    | 100 |

**Native Fish Species Collected:**

|                         |           |
|-------------------------|-----------|
| Oregon Chub             | <b>20</b> |
| Cottids                 | 5         |
| Speckled Dace           | 40        |
| Redside Shiners         | 40        |
| Northern Pikeminnows    |           |
| Largescale Suckers      |           |
| Sand Rollers            |           |
| Threespine Sticklebacks |           |
| Salmonids <sup>2</sup>  |           |
| Lamprey                 |           |
| Chiselmouth             |           |

**Non-native Fish Species Collected:**

|                      |  |
|----------------------|--|
| Western Mosquitofish |  |
| Bullheads            |  |
| Common Carp          |  |
| Bluegills            |  |
| Largemouth Bass      |  |
| Pumpkinseeds         |  |
| Crappies             |  |
| Smallmouth Bass      |  |
| Banded Killifish     |  |

**Other:**

**NOTE:** MRT PROP., P/A

Appendix A (continued).

**MCKENZIE RIVER BASIN**

|           |                                    |                    |                 |         |
|-----------|------------------------------------|--------------------|-----------------|---------|
| Site Name | <b>MCKENZIE EZELL SOUTH SLOUGH</b> | Map Code           | <b>EZELL2A*</b> |         |
| Basin     | MCKENZIE RIVER                     | Sampling Date      | 9/12/2015       |         |
| Subbasin  |                                    | Location: Zone 10T | 506221          | 4879475 |

|                         |      |   |     |  |
|-------------------------|------|---|-----|--|
| Surface Area (m2)       | 2504 | <b>Types of aquatic vegetation <sup>1</sup></b> |     |  |
| Average Depth (m)       | 0.6  | Submergent                                      | 40  |  |
| Maximum Depth (m)       | 1.1  | Emergent  | 40  |  |
| Water Temperature (C)   |      | Floating  | 10  |  |
| Percent Silt / Organics | 100  | Algae   | 10  |  |
|                         |      | <i>Total</i>                                    | 100 |  |

**Native Fish Species Collected:**

|                         |           |
|-------------------------|-----------|
| Oregon Chub             | <b>40</b> |
| Cottids                 | 10        |
| Speckled Dace           | 20        |
| Redside Shiners         | 80        |
| Northern Pikeminnows    |           |
| Largescale Suckers      |           |
| Sand Rollers            |           |
| Threespine Sticklebacks | 40        |
| Salmonids <sup>2</sup>  |           |
| Lamprey                 |           |
| Chiselmouth             |           |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** MRT PROP., P/A

|           |                                    |                    |                 |         |
|-----------|------------------------------------|--------------------|-----------------|---------|
| Site Name | <b>MCKENZIE EZELL SOUTH SLOUGH</b> | Map Code           | <b>EZELL3A*</b> |         |
| Basin     | MCKENZIE RIVER                     | Sampling Date      | 9/12/2015       |         |
| Subbasin  |                                    | Location: Zone 10T | 506329          | 4879497 |

|                         |     |   |     |  |
|-------------------------|-----|---|-----|--|
| Surface Area (m2)       | 200 | <b>Types of aquatic vegetation <sup>1</sup></b> |     |  |
| Average Depth (m)       | 0.3 | Submergent                                      | 60  |  |
| Maximum Depth (m)       | 0.5 | Emergent  | 20  |  |
| Water Temperature (C)   |     | Floating  | 10  |  |
| Percent Silt / Organics | 100 | Algae   | 10  |  |
|                         |     | <i>Total</i>                                    | 100 |  |

**Native Fish Species Collected:**

|                           |          |
|---------------------------|----------|
| Oregon Chub               | <b>5</b> |
| Cottids                   | 2        |
| Speckled Dace             | 20       |
| Redside Shiners           | 30       |
| Northern Pikeminnows      |          |
| Largescale Suckers        |          |
| Sand Rollers              |          |
| Threespine Sticklebacks   |          |
| Salmonids <sup>2</sup> CT | 10       |
| Lamprey                   |          |
| Chiselmouth               |          |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** AT EDGE OF SPRING (CHUB USE SPRING)

Appendix A (continued).

**MCKENZIE RIVER BASIN**

|           |                       |                    |              |         |
|-----------|-----------------------|--------------------|--------------|---------|
| Site Name | <b>MCKENZIE OXBOW</b> | Map Code           | <b>MOX1F</b> |         |
| Basin     | MCKENZIE RIVER        | Sampling Date      | 7/6/2015     |         |
| Subbasin  |                       | Location: Zone 10T | 511995       | 4878728 |

|                         |       |
|-------------------------|-------|
| Surface Area (m2)       | 22500 |
| Average Depth (m)       | 0.5   |
| Maximum Depth (m)       | 2     |
| Water Temperature (C)   | 23.5  |
| Percent Silt / Organics | 50    |

|   |    |
|---|----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Submergent                                      | 63 |
| Emergent  | 15 |
| Floating  | 0  |
| Algae   | 5  |
| <i>Total</i>                                    | 83 |

**Native Fish Species Collected:**

|                           |             |
|---------------------------|-------------|
| Oregon Chub               | <b>3697</b> |
| Cottids                   | 8           |
| Speckled Dace             | 32          |
| Redside Shiners           | 2767        |
| Northern Pikeminnows      | 42          |
| Largescale Suckers        | 87          |
| Sand Rollers              | 1           |
| Threespine Sticklebacks   | 3848        |
| Salmonids <sup>2</sup> CH | 4           |
| Lamprey                   | 1           |
| Chiselmouth               |             |

**Non-native Fish Species Collected:**

|                      |    |
|----------------------|----|
| Western Mosquitofish |    |
| Bullheads            | 6  |
| Common Carp          |    |
| Bluegills            | 14 |
| Largemouth Bass      |    |
| Pumpkinseeds         |    |
| Crappies             |    |
| Smallmouth Bass      |    |
| Banded Killifish     |    |

**Other:**

**NOTE:** POP ESTIMATE, VIE YELLOW, LOW WATER

Appendix A (continued).

MIDDLE FORK WILLAMETTE RIVER BASIN

|           |                              |                    |                |         |
|-----------|------------------------------|--------------------|----------------|---------|
| Site Name | <b>BARNHARD SLOUGH</b>       | Map Code           | <b>BARN1P*</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER | Sampling Date      | 9/29/2015      |         |
| Subbasin  |                              | Location: Zone 10T | 539426         | 4843773 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 1440 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 1    | Submergent                                      | 15 |
| Maximum Depth (m)       | 2    | Emergent  | 20 |
| Water Temperature (C)   | 10   | Floating  | 20 |
| Percent Silt / Organics | 10   | Algae   | 10 |
|                         |      | <i>Total</i>                                    | 65 |

**Native Fish Species Collected:**

|                           |    |
|---------------------------|----|
| Oregon Chub               | 0  |
| Cottids                   | 1  |
| Speckled Dace             | 7  |
| Redside Shiners           | 8  |
| Northern Pikeminnows      |    |
| Largescale Suckers        | 6  |
| Sand Rollers              |    |
| Threespine Sticklebacks   |    |
| Salmonids <sup>2</sup> CT | 11 |
| Lamprey                   |    |
| Chiselmouth               |    |

**Non-native Fish Species Collected:**

|                      |  |
|----------------------|--|
| Western Mosquitofish |  |
| Bullheads            |  |
| Common Carp          |  |
| Bluegills            |  |
| Largemouth Bass      |  |
| Pumpkinseeds         |  |
| Crappies             |  |
| Smallmouth Bass      |  |
| Banded Killifish     |  |

**Other:**

**NOTE:** FLOODPLAIN STUDY SITE

|           |                              |                    |                |         |
|-----------|------------------------------|--------------------|----------------|---------|
| Site Name | <b>BAUMANN SLOUGH</b>        | Map Code           | <b>BAUM1C*</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER | Sampling Date      | 9/29/2015      |         |
| Subbasin  | FALL CREEK                   | Location: Zone 10T | 515956         | 4866355 |

|                         |     |   |    |
|-------------------------|-----|---|----|
| Surface Area (m2)       | 480 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.6 | Submergent                                      | 20 |
| Maximum Depth (m)       | 2   | Emergent  | 20 |
| Water Temperature (C)   | 10  | Floating  | 0  |
| Percent Silt / Organics | 20  | Algae   | 10 |
|                         |     | <i>Total</i>                                    | 50 |

**Native Fish Species Collected:**

|                         |     |
|-------------------------|-----|
| Oregon Chub             | 21  |
| Cottids                 | 1   |
| Speckled Dace           | 2   |
| Redside Shiners         | 255 |
| Northern Pikeminnows    | 4   |
| Largescale Suckers      | 3   |
| Sand Rollers            |     |
| Threespine Sticklebacks |     |
| Salmonids <sup>2</sup>  |     |
| Lamprey                 |     |
| Chiselmouth             |     |

**Non-native Fish Species Collected:**

|                      |    |
|----------------------|----|
| Western Mosquitofish | 1  |
| Bullheads            | 9  |
| Common Carp          |    |
| Bluegills            | 46 |
| Largemouth Bass      |    |
| Pumpkinseeds         |    |
| Crappies             |    |
| Smallmouth Bass      |    |
| Banded Killifish     |    |

**Other:**

BBH & YBH

**NOTE:** HEAVY SEDIMENTATION



Appendix A (continued).

MIDDLE FORK WILLAMETTE RIVER BASIN

|           |                              |                    |                |         |
|-----------|------------------------------|--------------------|----------------|---------|
| Site Name | <b>BREWER SLOUGH</b>         | Map Code           | <b>BREW1C*</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER | Sampling Date      | 9/19/2015      |         |
| Subbasin  | FALL CREEK                   | Location: Zone 10T | 514753         | 4866528 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 160  | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.5  | Submergent                                      | 20 |
| Maximum Depth (m)       | 1.1  | Emergent  | 30 |
| Water Temperature (C)   | 10.5 | Floating  | 0  |
| Percent Silt / Organics | 40   | Algae   | 10 |
|                         |      | <i>Total</i>                                    | 60 |

**Native Fish Species Collected:**

|                         |     |
|-------------------------|-----|
| Oregon Chub             | 21  |
| Cottids                 | 72  |
| Speckled Dace           | 43  |
| Redside Shiners         | 142 |
| Northern Pikeminnows    | 3   |
| Largescale Suckers      | 34  |
| Sand Rollers            |     |
| Threespine Sticklebacks |     |
| Salmonids <sup>2</sup>  |     |
| Lamprey                 |     |
| Chiselmouth             |     |

**Non-native Fish Species Collected:**

|                      |  |
|----------------------|--|
| Western Mosquitofish |  |
| Bullheads            |  |
| Common Carp          |  |
| Bluegills            |  |
| Largemouth Bass      |  |
| Pumpkinseeds         |  |
| Crappies             |  |
| Smallmouth Bass      |  |
| Banded Killifish     |  |

**Other:**

**NOTE:** HEAVY SILTATION

|           |                              |                    |               |         |
|-----------|------------------------------|--------------------|---------------|---------|
| Site Name | <b>DEEP MUDDY SLOUGH</b>     | Map Code           | <b>MF14G*</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER | Sampling Date      | 8/5/2015      |         |
| Subbasin  |                              | Location: Zone 10T | 510783        | 4868002 |

|                         |     |   |    |
|-------------------------|-----|---|----|
| Surface Area (m2)       | 500 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.4 | Submergent                                      |    |
| Maximum Depth (m)       | 0.8 | Emergent  | 60 |
| Water Temperature (C)   | 18  | Floating  | 25 |
| Percent Silt / Organics | 100 | Algae   | 5  |
|                         |     | <i>Total</i>                                    | 90 |

**Native Fish Species Collected:**

|                         |    |
|-------------------------|----|
| Oregon Chub             | 87 |
| Cottids                 | 10 |
| Speckled Dace           | 6  |
| Redside Shiners         | 6  |
| Northern Pikeminnows    | 34 |
| Largescale Suckers      | 5  |
| Sand Rollers            |    |
| Threespine Sticklebacks | 3  |
| Salmonids <sup>2</sup>  |    |
| Lamprey                 |    |
| Chiselmouth             |    |

**Non-native Fish Species Collected:**

|                      |   |
|----------------------|---|
| Western Mosquitofish | 7 |
| Bullheads            |   |
| Common Carp          |   |
| Bluegills            |   |
| Largemouth Bass      |   |
| Pumpkinseeds         |   |
| Crappies             |   |
| Smallmouth Bass      |   |
| Banded Killifish     |   |

**Other:**

GREEN=1

**NOTE:** POP EST - FLOODPLAIN STUDY SITE, 1R VIE

Appendix A (continued).

MIDDLE FORK WILLAMETTE RIVER BASIN

|           |                                |                    |              |         |
|-----------|--------------------------------|--------------------|--------------|---------|
| Site Name | <b>DEXTER ALCOVE "THE PIT"</b> | Map Code           | <b>PIT1W</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER   | Sampling Date      | 4/27/2015    |         |
| Subbasin  | DEXTER RESERVOIR               | Location: Zone 10T | 517270       | 4861753 |

|                         |     |
|-------------------------|-----|
| Surface Area (m2)       | 780 |
| Average Depth (m)       | 0.5 |
| Maximum Depth (m)       | 1.5 |
| Water Temperature (C)   | 10  |
| Percent Silt / Organics | 100 |

|   |    |
|---|----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Submergent                                      | 0  |
| Emergent  | 25 |
| Floating  | 0  |
| Algae   | 10 |
| <i>Total</i>                                    | 35 |

**Native Fish Species Collected:**

|                         |             |
|-------------------------|-------------|
| Oregon Chub             | <b>1471</b> |
| Cottids                 | 2           |
| Speckled Dace           |             |
| Redside Shiners         | 3           |
| Northern Pikeminnows    | 30          |
| Largescale Suckers      |             |
| Sand Rollers            |             |
| Threespine Sticklebacks |             |
| Salmonids <sup>2</sup>  |             |
| Lamprey                 |             |
| Chiselmouth             |             |

**Non-native Fish Species Collected:**

|                      |  |
|----------------------|--|
| Western Mosquitofish |  |
| Bullheads            |  |
| Common Carp          |  |
| Bluegills            |  |
| Largemouth Bass      |  |
| Pumpkinseeds         |  |
| Crappies             |  |
| Smallmouth Bass      |  |
| Banded Killifish     |  |

**Other:**

**NOTE:** POPULATION ESTIMATE

|           |                              |                    |               |         |
|-----------|------------------------------|--------------------|---------------|---------|
| Site Name | <b>DEXTER DAM SLOUGH</b>     | Map Code           | <b>EB26G*</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER | Sampling Date      | 8/3/2015      |         |
| Subbasin  | ELIJAH BRISTOW               | Location: Zone 10T | 515281        | 4863226 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 1800 |
| Average Depth (m)       | 0.3  |
| Maximum Depth (m)       | 0.5  |
| Water Temperature (C)   | 20   |
| Percent Silt / Organics | 70   |

|   |    |
|---|----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Submergent                                      | 55 |
| Emergent  | 10 |
| Floating  | 0  |
| Algae   | 15 |
| <i>Total</i>                                    | 80 |

**Native Fish Species Collected:**

|                           |            |
|---------------------------|------------|
| Oregon Chub               | <b>896</b> |
| Cottids                   | 7          |
| Speckled Dace             | 78         |
| Redside Shiners           | 30         |
| Northern Pikeminnows      | 3          |
| Largescale Suckers        |            |
| Sand Rollers              |            |
| Threespine Sticklebacks   |            |
| Salmonids <sup>2</sup> CT | 1          |
| Lamprey                   |            |
| Chiselmouth               |            |

**Non-native Fish Species Collected:**

|                      |     |
|----------------------|-----|
| Western Mosquitofish |     |
| Bullheads            | 6   |
| Common Carp          |     |
| Bluegills            | 210 |
| Largemouth Bass      |     |
| Pumpkinseeds         |     |
| Crappies             |     |
| Smallmouth Bass      |     |
| Banded Killifish     |     |

**Other:**

**NOTE:** POP EST, FLOODPLAIN SITE, VIE ORANGE

Appendix A (continued).

MIDDLE FORK WILLAMETTE RIVER BASIN

|           |                              |                    |              |         |
|-----------|------------------------------|--------------------|--------------|---------|
| Site Name | <b>DEXTER RV ALCOVE</b>      | Map Code           | <b>DEX3U</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER | Sampling Date      | 4/20/2015    |         |
| Subbasin  | DEXTER RESERVOIR             | Location: Zone 10T | 515504       | 4862061 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 1650 |
| Average Depth (m)       | 1    |
| Maximum Depth (m)       | 2.3  |
| Water Temperature (C)   | 15   |
| Percent Silt / Organics | 100  |

|   |     |
|---|-----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |     |
| Submergent                                      | 60  |
| Emergent  | 20  |
| Floating  | 0   |
| Algae   | 20  |
| <i>Total</i>                                    | 100 |

**Native Fish Species Collected:**

|                         |             |
|-------------------------|-------------|
| Oregon Chub             | <b>6546</b> |
| Cottids                 | 50          |
| Speckled Dace           |             |
| Redside Shiners         | 81          |
| Northern Pikeminnows    | 14          |
| Largescale Suckers      |             |
| Sand Rollers            |             |
| Threespine Sticklebacks |             |
| Salmonids <sup>2</sup>  |             |
| Lamprey                 |             |
| Chiselmouth             |             |

**Non-native Fish Species Collected:**

|                      |  |
|----------------------|--|
| Western Mosquitofish |  |
| Bullheads            |  |
| Common Carp          |  |
| Bluegills            |  |
| Largemouth Bass      |  |
| Pumpkinseeds         |  |
| Crappies             |  |
| Smallmouth Bass      |  |
| Banded Killifish     |  |

**Other:**

**NOTE:** POPULATION ESTIMATE

|           |                              |                    |                |         |
|-----------|------------------------------|--------------------|----------------|---------|
| Site Name | <b>DOUGREN ISLAND SLOUGH</b> | Map Code           | <b>MF16BB*</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER | Sampling Date      | 8/18/2015      |         |
| Subbasin  |                              | Location: Zone 10T | 510717         | 4868355 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 1200 |
| Average Depth (m)       | 0.3  |
| Maximum Depth (m)       | 0.6  |
| Water Temperature (C)   | 20   |
| Percent Silt / Organics | 10   |

|   |    |
|---|----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Submergent                                      | 0  |
| Emergent  | 0  |
| Floating  | 25 |
| Algae   | 0  |
| <i>Total</i>                                    | 25 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>106</b> |
| Cottids                 | 1          |
| Speckled Dace           |            |
| Redside Shiners         | 5          |
| Northern Pikeminnows    |            |
| Largescale Suckers      | 3          |
| Sand Rollers            |            |
| Threespine Sticklebacks |            |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 |            |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |    |
|----------------------|----|
| Western Mosquitofish | 60 |
| Bullheads            |    |
| Common Carp          |    |
| Bluegills            |    |
| Largemouth Bass      |    |
| Pumpkinseeds         |    |
| Crappies             |    |
| Smallmouth Bass      |    |
| Banded Killifish     |    |

**Other:**

**NOTE:** ACROSS FROM DOUG SLOUGH, VIE RED, EST

Appendix A (continued).

MIDDLE FORK WILLAMETTE RIVER BASIN

|           |                              |                    |                |
|-----------|------------------------------|--------------------|----------------|
| Site Name | <b>DOUGREN SLOUGH</b>        | Map Code           | <b>MF15G*</b>  |
| Basin     | MIDDLE FORK WILLAMETTE RIVER | Sampling Date      | 8/12/2015      |
| Subbasin  |                              | Location: Zone 10T | 510579 4868037 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 1000 |
| Average Depth (m)       | 0.5  |
| Maximum Depth (m)       | 2    |
| Water Temperature (C)   | 20   |
| Percent Silt / Organics | 75   |

|   |    |
|---|----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Submergent                                      | 65 |
| Emergent  | 15 |
| Floating  | 5  |
| Algae   | 5  |
| <i>Total</i>                                    | 90 |

**Native Fish Species Collected:**

|                                  |             |
|----------------------------------|-------------|
| Oregon Chub                      | <b>1007</b> |
| Cottids                          | 3           |
| Speckled Dace                    | 1           |
| Redside Shiners                  | 6           |
| Northern Pikeminnows             | 4           |
| Largescale Suckers               | 30          |
| Sand Rollers                     |             |
| Threespine Sticklebacks          | 9           |
| Salmonids <sup>2</sup> RT=3/CT=2 | 4           |
| Lamprey                          | 12          |
| Chiselmouth                      |             |

**Non-native Fish Species Collected:**

|                      |    |
|----------------------|----|
| Western Mosquitofish | 19 |
| Bullheads            |    |
| Common Carp          |    |
| Bluegills            |    |
| Largemouth Bass      |    |
| Pumpkinseeds         |    |
| Crappies             |    |
| Smallmouth Bass      |    |
| Banded Killifish     |    |

**Other:** GREEN=3

**NOTE:** POP EST, FLOODPLAIN SITE, VIE RED

|           |                                |                    |                |
|-----------|--------------------------------|--------------------|----------------|
| Site Name | <b>DOUGREN SLOUGH UPSTREAM</b> | Map Code           | <b>MF17B*</b>  |
| Basin     | MIDDLE FORK WILLAMETTE RIVER   | Sampling Date      | 8/12/2015      |
| Subbasin  |                                | Location: Zone 10T | 510570 4867958 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 1000 |
| Average Depth (m)       | 0.6  |
| Maximum Depth (m)       | 2.2  |
| Water Temperature (C)   | 22   |
| Percent Silt / Organics | 30   |

|   |    |
|---|----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Submergent                                      | 35 |
| Emergent  | 10 |
| Floating  | 5  |
| Algae   | 5  |
| <i>Total</i>                                    | 55 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>140</b> |
| Cottids                 |            |
| Speckled Dace           |            |
| Redside Shiners         | 7          |
| Northern Pikeminnows    |            |
| Largescale Suckers      | 4          |
| Sand Rollers            |            |
| Threespine Sticklebacks |            |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 |            |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |    |
|----------------------|----|
| Western Mosquitofish | 40 |
| Bullheads            |    |
| Common Carp          |    |
| Bluegills            |    |
| Largemouth Bass      |    |
| Pumpkinseeds         |    |
| Crappies             |    |
| Smallmouth Bass      |    |
| Banded Killifish     |    |

**Other:**

**NOTE:** POP EST, RED VIE CHUB PRESENT ~1/4

Appendix A (continued).

MIDDLE FORK WILLAMETTE RIVER BASIN

|           |                                    |                    |                |         |
|-----------|------------------------------------|--------------------|----------------|---------|
| Site Name | <b>ELIJAH BRISTOW BERRY SLOUGH</b> | Map Code           | <b>EB1-11W</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER       | Sampling Date      | 5/18/2015      |         |
| Subbasin  | ELIJAH BRISTOW                     | Location: Zone 10T | 513244         | 4865199 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 5650 |
| Average Depth (m)       | 0.75 |
| Maximum Depth (m)       | 1.25 |
| Water Temperature (C)   | 15   |
| Percent Silt / Organics | 100  |

|   |     |
|---|-----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |     |
| Submergent                                      | 25  |
| Emergent  | 30  |
| Floating  | 40  |
| Algae   | 5   |
| <i>Total</i>                                    | 100 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>332</b> |
| Cottids                 |            |
| Speckled Dace           | 542        |
| Redside Shiners         | 110        |
| Northern Pikeminnows    |            |
| Largescale Suckers      |            |
| Sand Rollers            |            |
| Threespine Sticklebacks | 110        |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 |            |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |   |
|----------------------|---|
| Western Mosquitofish |   |
| Bullheads            | 4 |
| Common Carp          |   |
| Bluegills            |   |
| Largemouth Bass      |   |
| Pumpkinseeds         |   |
| Crappies             |   |
| Smallmouth Bass      |   |
| Banded Killifish     |   |

**Other:**

**NOTE:** POP EST, UPS HAB DRY SUMMER 15

|           |                                   |                    |                   |         |
|-----------|-----------------------------------|--------------------|-------------------|---------|
| Site Name | <b>ELIJAH BRISTOW ISLAND POND</b> | Map Code           | <b>MF80*,120*</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER      | Sampling Date      | 8/10/2015         |         |
| Subbasin  | ELIJAH BRISTOW                    | Location: Zone 10T | 514043            | 4864334 |

|                         |       |
|-------------------------|-------|
| Surface Area (m2)       | 10490 |
| Average Depth (m)       | 0.5   |
| Maximum Depth (m)       | 1.5   |
| Water Temperature (C)   | 17.5  |
| Percent Silt / Organics | 80    |

|   |    |
|---|----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Submergent                                      | 60 |
| Emergent  | 10 |
| Floating  | 0  |
| Algae   | 10 |
| <i>Total</i>                                    | 80 |

**Native Fish Species Collected:**

|                         |             |
|-------------------------|-------------|
| Oregon Chub             | <b>3948</b> |
| Cottids                 | 22          |
| Speckled Dace           | 4628        |
| Redside Shiners         | 46          |
| Northern Pikeminnows    | 1           |
| Largescale Suckers      | 440         |
| Sand Rollers            |             |
| Threespine Sticklebacks |             |
| Salmonids <sup>2</sup>  |             |
| Lamprey                 |             |
| Chiselmouth             |             |

**Non-native Fish Species Collected:**

|                      |    |
|----------------------|----|
| Western Mosquitofish | 49 |
| Bullheads            |    |
| Common Carp          |    |
| Bluegills            |    |
| Largemouth Bass      |    |
| Pumpkinseeds         |    |
| Crappies             |    |
| Smallmouth Bass      |    |
| Banded Killifish     |    |

**Other:**

**NOTE:** POP EST - FLOODPLAIN STUDY SITE

Appendix A (continued).

MIDDLE FORK WILLAMETTE RIVER BASIN

|           |                                       |                    |               |         |
|-----------|---------------------------------------|--------------------|---------------|---------|
| Site Name | <b>ELIJAH BRISTOW NE GRAVEL PIT 1</b> | Map Code           | <b>EB30G*</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER          | Sampling Date      | 8/10/2015     |         |
| Subbasin  | ELIJAH BRISTOW                        | Location: Zone 10T | 513830        | 4865059 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 1000 |
| Average Depth (m)       | 1    |
| Maximum Depth (m)       | 5    |
| Water Temperature (C)   | 23.5 |
| Percent Silt / Organics | 15   |

|   |     |
|---|-----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |     |
| Submergent                                      | 55  |
| Emergent  | 30  |
| Floating  | 5   |
| Algae   | 10  |
| <i>Total</i>                                    | 100 |

**Native Fish Species Collected:**

|                           |             |
|---------------------------|-------------|
| Oregon Chub               | <b>1865</b> |
| Cottids                   | 4           |
| Speckled Dace             | 910         |
| Redside Shiners           | 36          |
| Northern Pikeminnows      | 5           |
| Largescale Suckers        | 11          |
| Sand Rollers              |             |
| Threespine Sticklebacks   |             |
| Salmonids <sup>2</sup> CT | 5           |
| Lamprey                   |             |
| Chiselmouth               |             |

**Non-native Fish Species Collected:**

|                      |      |
|----------------------|------|
| Western Mosquitofish | 1000 |
| Bullheads            |      |
| Common Carp          |      |
| Bluegills            | 2    |
| Largemouth Bass      |      |
| Pumpkinseeds         |      |
| Crappies             |      |
| Smallmouth Bass      |      |
| Banded Killifish     |      |

**Other:**

**NOTE:** POP EST - FLOODPLAIN STUDY 2010

|           |                                    |                    |              |         |
|-----------|------------------------------------|--------------------|--------------|---------|
| Site Name | <b>ELIJAH BRISTOW NORTH SLOUGH</b> | Map Code           | <b>EBN1Q</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER       | Sampling Date      | 5/4/2015     |         |
| Subbasin  | ELIJAH BRISTOW                     | Location: Zone 10T | 514931       | 4864608 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 3000 |
| Average Depth (m)       | 0.5  |
| Maximum Depth (m)       | 1.5  |
| Water Temperature (C)   | 12   |
| Percent Silt / Organics | 90   |

|   |    |
|---|----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Submergent                                      | 30 |
| Emergent  | 40 |
| Floating  | 10 |
| Algae   | 0  |
| <i>Total</i>                                    | 80 |

**Native Fish Species Collected:**

|                         |             |
|-------------------------|-------------|
| Oregon Chub             | <b>1363</b> |
| Cottids                 | 8           |
| Speckled Dace           | 310         |
| Redside Shiners         | 48          |
| Northern Pikeminnows    | 112         |
| Largescale Suckers      |             |
| Sand Rollers            |             |
| Threespine Sticklebacks |             |
| Salmonids <sup>2</sup>  |             |
| Lamprey                 |             |
| Chiselmouth             |             |

**Non-native Fish Species Collected:**

|                      |   |
|----------------------|---|
| Western Mosquitofish |   |
| Bullheads            |   |
| Common Carp          |   |
| Bluegills            | 6 |
| Largemouth Bass      |   |
| Pumpkinseeds         |   |
| Crappies             |   |
| Smallmouth Bass      |   |
| Banded Killifish     |   |

**Other:**

**NOTE:** POP EST. - FLDPLN STUDY SITE, VIE PINK

Appendix A (continued).

MIDDLE FORK WILLAMETTE RIVER BASIN

|           |                                 |                    |               |         |
|-----------|---------------------------------|--------------------|---------------|---------|
| Site Name | <b>ELIJAH BRISTOW SE SLOUGH</b> | Map Code           | <b>EB21J*</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER    | Sampling Date      | 8/3/2015      |         |
| Subbasin  | ELIJAH BRISTOW                  | Location: Zone 10T | 514551        | 4863630 |

|                         |     |   |    |
|-------------------------|-----|---|----|
| Surface Area (m2)       | 600 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.5 | Submergent                                      | 25 |
| Maximum Depth (m)       | 1.5 | Emergent  | 15 |
| Water Temperature (C)   | 18  | Floating  | 5  |
| Percent Silt / Organics | 15  | Algae   | 5  |
|                         |     | <i>Total</i>                                    | 50 |

**Native Fish Species Collected:**

|                           |             |
|---------------------------|-------------|
| Oregon Chub               | <b>1554</b> |
| Cottids                   | 261         |
| Speckled Dace             | 1354        |
| Redside Shiners           | 1088        |
| Northern Pikeminnows      | 5           |
| Largescale Suckers        | 206         |
| Sand Rollers              |             |
| Threespine Sticklebacks   |             |
| Salmonids <sup>2</sup> CT | 3           |
| Lamprey                   | 2           |
| Chiselmouth               |             |

**Non-native Fish Species Collected:**

|                      |   |
|----------------------|---|
| Western Mosquitofish | 9 |
| Bullheads            |   |
| Common Carp          |   |
| Bluegills            |   |
| Largemouth Bass      |   |
| Pumpkinseeds         |   |
| Crappies             |   |
| Smallmouth Bass      |   |
| Banded Killifish     |   |

**Other:**

**NOTE:** POP EST - FLOODPLAIN STUDY SITE

|           |                                 |                    |               |         |
|-----------|---------------------------------|--------------------|---------------|---------|
| Site Name | <b>ELIJAH BRISTOW SE SLOUGH</b> | Map Code           | <b>EB22E*</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER    | Sampling Date      | 8/5/2015      |         |
| Subbasin  | ELIJAH BRISTOW                  | Location: Zone 10T | 514521        | 4863691 |

|                         |      |   |     |
|-------------------------|------|---|-----|
| Surface Area (m2)       | 1500 | <b>Types of aquatic vegetation <sup>1</sup></b> |     |
| Average Depth (m)       | 0.5  | Submergent                                      | 70  |
| Maximum Depth (m)       | 2    | Emergent  | 20  |
| Water Temperature (C)   | 18   | Floating  | 10  |
| Percent Silt / Organics | 10   | Algae   | 0   |
|                         |      | <i>Total</i>                                    | 100 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>125</b> |
| Cottids                 | 4          |
| Speckled Dace           | 41         |
| Redside Shiners         |            |
| Northern Pikeminnows    |            |
| Largescale Suckers      |            |
| Sand Rollers            |            |
| Threespine Sticklebacks |            |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 |            |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |  |
|----------------------|--|
| Western Mosquitofish |  |
| Bullheads            |  |
| Common Carp          |  |
| Bluegills            |  |
| Largemouth Bass      |  |
| Pumpkinseeds         |  |
| Crappies             |  |
| Smallmouth Bass      |  |
| Banded Killifish     |  |

**Other:**

**NOTE:** DOWNSTREAM OF EB SOUTH SITE, P/A SAMPLE

Appendix A (continued).

MIDDLE FORK WILLAMETTE RIVER BASIN

|           |                                     |                    |               |         |
|-----------|-------------------------------------|--------------------|---------------|---------|
| Site Name | <b>FALL CREEK CONFLUENCE SLOUGH</b> | Map Code           | <b>FCC1C*</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER        | Sampling Date      | 9/29/2015     |         |
| Subbasin  | FALL CREEK                          | Location: Zone 10T | 511037        | 4868799 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 500  |
| Average Depth (m)       | 0.3  |
| Maximum Depth (m)       | 0.8  |
| Water Temperature (C)   | 10.5 |
| Percent Silt / Organics | 10   |

|   |    |
|---|----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Submergent                                      | 5  |
| Emergent  | 10 |
| Floating  | 0  |
| Algae   | 20 |
| <i>Total</i>                                    | 35 |

**Native Fish Species Collected:**

|                         |     |
|-------------------------|-----|
| Oregon Chub             | 1   |
| Cottids                 | 15  |
| Speckled Dace           | 4   |
| Redside Shiners         | 4   |
| Northern Pikeminnows    | 6   |
| Largescale Suckers      | 189 |
| Sand Rollers            |     |
| Threespine Sticklebacks |     |
| Salmonids <sup>2</sup>  |     |
| Lamprey                 |     |
| Chiselmouth             |     |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** SIDE CHANNEL AT THE MOUTH OF FALL CREEK

|           |                                   |                    |               |         |
|-----------|-----------------------------------|--------------------|---------------|---------|
| Site Name | <b>FALL CREEK SPILLWAY POND 1</b> | Map Code           | <b>FCSP1V</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER      | Sampling Date      | 4/27/2015     |         |
| Subbasin  | FALL CREEK                        | Location: Zone 10T | 519285        | 4865320 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 1875 |
| Average Depth (m)       | 0.5  |
| Maximum Depth (m)       | 1.5  |
| Water Temperature (C)   | 14.5 |
| Percent Silt / Organics | 100  |

|   |    |
|---|----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Submergent                                      | 40 |
| Emergent  | 15 |
| Floating  | 5  |
| Algae   | 5  |
| <i>Total</i>                                    | 65 |

**Native Fish Species Collected:**

|                         |      |
|-------------------------|------|
| Oregon Chub             | 4545 |
| Cottids                 |      |
| Speckled Dace           | 3110 |
| Redside Shiners         |      |
| Northern Pikeminnows    |      |
| Largescale Suckers      |      |
| Sand Rollers            |      |
| Threespine Sticklebacks |      |
| Salmonids <sup>2</sup>  |      |
| Lamprey                 |      |
| Chiselmouth             |      |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** REINTROD, POP EST



Appendix A (continued).

MIDDLE FORK WILLAMETTE RIVER BASIN

|           |                                   |                    |                |
|-----------|-----------------------------------|--------------------|----------------|
| Site Name | <b>FALL CREEK SPILLWAY POND 2</b> | Map Code           | <b>FCSP2J</b>  |
| Basin     | MIDDLE FORK WILLAMETTE RIVER      | Sampling Date      | 4/27/2015      |
| Subbasin  | FALL CREEK                        | Location: Zone 10T | 519285 4865320 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 6000 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.4  | Submergent                                      | 40 |
| Maximum Depth (m)       | 1.2  | Emergent  | 15 |
| Water Temperature (C)   | 14.5 | Floating  | 5  |
| Percent Silt / Organics | 100  | Algae   | 5  |
|                         |      | <i>Total</i>                                    | 65 |

**Native Fish Species Collected:**

|                         |             |
|-------------------------|-------------|
| Oregon Chub             | <b>8888</b> |
| Cottids                 | 1           |
| Speckled Dace           | 2843        |
| Redside Shiners         |             |
| Northern Pikeminnows    |             |
| Largescale Suckers      |             |
| Sand Rollers            |             |
| Threespine Sticklebacks |             |
| Salmonids <sup>2</sup>  |             |
| Lamprey                 |             |
| Chiselmouth             |             |

**Non-native Fish Species Collected:**

|                      |    |
|----------------------|----|
| Western Mosquitofish |    |
| Bullheads            | 10 |
| Common Carp          |    |
| Bluegills            |    |
| Largemouth Bass      |    |
| Pumpkinseeds         |    |
| Crappies             |    |
| Smallmouth Bass      |    |
| Banded Killifish     |    |

**Other:**

**NOTE:** POP EST, ACTIVE BV, 4 PONDS

|           |                               |                    |                |
|-----------|-------------------------------|--------------------|----------------|
| Site Name | <b>GREEN GRASS GRAVEL PIT</b> | Map Code           | <b>GGGP1C*</b> |
| Basin     | MIDDLE FORK WILLAMETTE RIVER  | Sampling Date      | 8/20/2015      |
| Subbasin  |                               | Location: Zone 10T | 508909 4869179 |

|                         |      |   |     |
|-------------------------|------|---|-----|
| Surface Area (m2)       | 1560 | <b>Types of aquatic vegetation <sup>1</sup></b> |     |
| Average Depth (m)       | 0.75 | Submergent                                      | 80  |
| Maximum Depth (m)       | 2    | Emergent  | 10  |
| Water Temperature (C)   | 16   | Floating  | 5   |
| Percent Silt / Organics | 30   | Algae   | 5   |
|                         |      | <i>Total</i>                                    | 100 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 |          |
| Speckled Dace           |          |
| Redside Shiners         |          |
| Northern Pikeminnows    |          |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks |          |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |   |
|----------------------|---|
| Western Mosquitofish |   |
| Bullheads            | 2 |
| Common Carp          |   |
| Bluegills            | 1 |
| Largemouth Bass      |   |
| Pumpkinseeds         |   |
| Crappies             |   |
| Smallmouth Bass      |   |
| Banded Killifish     |   |

**Other:**

**NOTE:** GRAVEL PIT ON MFW ISLAND NEAR MF10, P/A

Appendix A (continued).

MIDDLE FORK WILLAMETTE RIVER BASIN

|           |                              |                    |              |         |
|-----------|------------------------------|--------------------|--------------|---------|
| Site Name | <b>HAWS ENHANCEMENT POND</b> | Map Code           | <b>HAW2F</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER | Sampling Date      | 5/4/2015     |         |
| Subbasin  |                              | Location: Zone 10T | 539759       | 4843167 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 1200 |
| Average Depth (m)       | 1.75 |
| Maximum Depth (m)       | 2.5  |
| Water Temperature (C)   | 13   |
| Percent Silt / Organics | 35   |

|   |     |
|---|-----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |     |
| Submergent                                      | 0   |
| Emergent  | 15  |
| Floating  | 0   |
| Algae   | 85  |
| <i>Total</i>                                    | 100 |

**Native Fish Species Collected:**

|                         |             |
|-------------------------|-------------|
| Oregon Chub             | <b>3222</b> |
| Cottids                 |             |
| Speckled Dace           | 315         |
| Redside Shiners         | 260         |
| Northern Pikeminnows    |             |
| Largescale Suckers      |             |
| Sand Rollers            |             |
| Threespine Sticklebacks |             |
| Salmonids <sup>2</sup>  |             |
| Lamprey                 |             |
| Chiselmouth             |             |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** INTRO, POP EST, 5 LEGGED NWS

|           |                              |                    |              |         |
|-----------|------------------------------|--------------------|--------------|---------|
| Site Name | <b>HAWS POND</b>             | Map Code           | <b>HAW1J</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER | Sampling Date      | 5/4/2015     |         |
| Subbasin  |                              | Location: Zone 10T | 539931       | 4843130 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 1000 |
| Average Depth (m)       | 1    |
| Maximum Depth (m)       | 2    |
| Water Temperature (C)   | 11   |
| Percent Silt / Organics | 20   |

|   |    |
|---|----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Submergent                                      | 30 |
| Emergent  | 20 |
| Floating  | 0  |
| Algae   | 15 |
| <i>Total</i>                                    | 65 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>213</b> |
| Cottids                 |            |
| Speckled Dace           | 651        |
| Redside Shiners         | 769        |
| Northern Pikeminnows    |            |
| Largescale Suckers      | 2          |
| Sand Rollers            |            |
| Threespine Sticklebacks |            |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 | 5          |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** POP ESTIMATE, 2010 FLOW ALTERED HABITAT

Appendix A (continued).

MIDDLE FORK WILLAMETTE RIVER BASIN

|           |                              |                    |               |         |
|-----------|------------------------------|--------------------|---------------|---------|
| Site Name | <b>HILLS CREEK POND</b>      | Map Code           | <b>HCP1G*</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER | Sampling Date      | 9/28/2015     |         |
| Subbasin  | HILLS CREEK                  | Location: Zone 10T | 546154        | 4839955 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 3000 |
| Average Depth (m)       | 0.2  |
| Maximum Depth (m)       | 0.3  |
| Water Temperature (C)   | 15.5 |
| Percent Silt / Organics | 100  |

|   |     |
|---|-----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |     |
| Submergent                                      | 65  |
| Emergent  | 15  |
| Floating  | 10  |
| Algae   | 10  |
| <i>Total</i>                                    | 100 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>326</b> |
| Cottids                 |            |
| Speckled Dace           |            |
| Redside Shiners         |            |
| Northern Pikeminnows    |            |
| Largescale Suckers      |            |
| Sand Rollers            |            |
| Threespine Sticklebacks |            |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 |            |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** INTRO SITE, POP EST, V. LOW WATER

|           |                              |                    |                |         |
|-----------|------------------------------|--------------------|----------------|---------|
| Site Name | <b>HIPPO SLOUGH</b>          | Map Code           | <b>HIPPO1*</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER | Sampling Date      | 8/25/2015      |         |
| Subbasin  |                              | Location: Zone 10T | 511113         | 4867876 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 1000 |
| Average Depth (m)       | 0.5  |
| Maximum Depth (m)       | 1.5  |
| Water Temperature (C)   | 18   |
| Percent Silt / Organics | 20   |

|   |    |
|---|----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Submergent                                      | 50 |
| Emergent  | 20 |
| Floating  | 0  |
| Algae   | 10 |
| <i>Total</i>                                    | 80 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>9</b> |
| Cottids                 | 4        |
| Speckled Dace           | 132      |
| Redside Shiners         | 23       |
| Northern Pikeminnows    | 2        |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks | 7        |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** P/A, SMALL PORTION SAMPLED

Appendix A (continued).

MIDDLE FORK WILLAMETTE RIVER BASIN

|           |                                  |                    |             |         |
|-----------|----------------------------------|--------------------|-------------|---------|
| Site Name | <b>HOSPITAL IMPOUNDMENT POND</b> | Map Code           | <b>HI1T</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER     | Sampling Date      | 4/20/2015   |         |
| Subbasin  |                                  | Location: Zone 10T | 533115      | 4851517 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 1768 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.25 | Submergent                                      | 0  |
| Maximum Depth (m)       | 0.5  | Emergent  | 25 |
| Water Temperature (C)   | 13   | Floating  | 70 |
| Percent Silt / Organics | 90   | Algae   | 0  |
|                         |      | <i>Total</i>                                    | 95 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 | 9        |
| Speckled Dace           |          |
| Redside Shiners         |          |
| Northern Pikeminnows    |          |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks |          |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** P/A, NO CHUB

|           |                              |                    |              |         |
|-----------|------------------------------|--------------------|--------------|---------|
| Site Name | <b>HOSPITAL POND</b>         | Map Code           | <b>HSP1W</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER | Sampling Date      | 4/20/2015    |         |
| Subbasin  |                              | Location: Zone 10T | 533115       | 4851567 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 5000 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 1.5  | Submergent                                      | 5  |
| Maximum Depth (m)       | 4    | Emergent  | 30 |
| Water Temperature (C)   | 10.5 | Floating  | 0  |
| Percent Silt / Organics | 95   | Algae   | 10 |
|                         |      | <i>Total</i>                                    | 45 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>869</b> |
| Cottids                 | 59         |
| Speckled Dace           |            |
| Redside Shiners         | 1322       |
| Northern Pikeminnows    |            |
| Largescale Suckers      |            |
| Sand Rollers            |            |
| Threespine Sticklebacks |            |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 |            |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** POPULATION ESTIMATE, ACOE ASSISTING

Appendix A (continued).

MIDDLE FORK WILLAMETTE RIVER BASIN

|           |                                     |                    |               |         |
|-----------|-------------------------------------|--------------------|---------------|---------|
| Site Name | <b>LOST CREEK CONFLUENCE SLOUGH</b> | Map Code           | <b>EB32C*</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER        | Sampling Date      | 8/5/2015      |         |
| Subbasin  | LOST CREEK                          | Location: Zone 10T | 512240        | 4866202 |

|                         |     |   |     |
|-------------------------|-----|---|-----|
| Surface Area (m2)       | 800 | <b>Types of aquatic vegetation <sup>1</sup></b> |     |
| Average Depth (m)       | 0.6 | Submergent                                      | 60  |
| Maximum Depth (m)       | 1.4 | Emergent  | 30  |
| Water Temperature (C)   | 17  | Floating  | 0   |
| Percent Silt / Organics | 90  | Algae   | 10  |
|                         |     | <i>Total</i>                                    | 100 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>504</b> |
| Cottids                 | 7          |
| Speckled Dace           | 25         |
| Redside Shiners         | 7          |
| Northern Pikeminnows    |            |
| Largescale Suckers      | 1          |
| Sand Rollers            |            |
| Threespine Sticklebacks | 20         |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 |            |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** E OF LOST CR MOUTH, POP EST

|           |                              |                    |              |         |
|-----------|------------------------------|--------------------|--------------|---------|
| Site Name | <b>PENGRA ISLAND SLOUGH</b>  | Map Code           | <b>MF9H*</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER | Sampling Date      | 8/18/2015    |         |
| Subbasin  |                              | Location: Zone 10T | 511283       | 4866938 |

|                         |     |   |    |
|-------------------------|-----|---|----|
| Surface Area (m2)       | 840 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.8 | Submergent                                      | 20 |
| Maximum Depth (m)       | 2.3 | Emergent  | 15 |
| Water Temperature (C)   | 17  | Floating  | 15 |
| Percent Silt / Organics | 10  | Algae   | 30 |
|                         |     | <i>Total</i>                                    | 80 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>111</b> |
| Cottids                 | 60         |
| Speckled Dace           | 616        |
| Redside Shiners         | 31         |
| Northern Pikeminnows    | 1          |
| Largescale Suckers      | 15         |
| Sand Rollers            |            |
| Threespine Sticklebacks | 1008       |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 | 12         |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** POP EST, FLOODPLAIN STUDY SITE

Appendix A (continued).

MIDDLE FORK WILLAMETTE RIVER BASIN

|           |                              |                    |                |
|-----------|------------------------------|--------------------|----------------|
| Site Name | <b>PENGRA OXBOW SLOUGH</b>   | Map Code           | <b>MF13G*</b>  |
| Basin     | MIDDLE FORK WILLAMETTE RIVER | Sampling Date      | 8/18/2015      |
| Subbasin  |                              | Location: Zone 10T | 511070 4867078 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 1000 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.5  | Submergent                                      | 40 |
| Maximum Depth (m)       | 1.25 | Emergent  | 5  |
| Water Temperature (C)   | 23   | Floating  | 40 |
| Percent Silt / Organics | 40   | Algae   | 5  |
|                         |      | <i>Total</i>                                    | 90 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>2</b> |
| Cottids                 | 4        |
| Speckled Dace           |          |
| Redside Shiners         |          |
| Northern Pikeminnows    | 3        |
| Largescale Suckers      | 7        |
| Sand Rollers            |          |
| Threespine Sticklebacks |          |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |      |
|----------------------|------|
| Western Mosquitofish | 1000 |
| Bullheads            | 201  |
| Common Carp          |      |
| Bluegills            | 145  |
| Largemouth Bass      | 2    |
| Pumpkinseeds         | 1    |
| Crappies             |      |
| Smallmouth Bass      |      |
| Banded Killifish     |      |

**Other:**

**NOTE:** POP EST, FLOODPLAIN STUDY SITE

|           |                               |                    |                |
|-----------|-------------------------------|--------------------|----------------|
| Site Name | <b>RAILROAD BRIDGE SLOUGH</b> | Map Code           | <b>MF10H*</b>  |
| Basin     | MIDDLE FORK WILLAMETTE RIVER  | Sampling Date      | 8/13/2015      |
| Subbasin  |                               | Location: Zone 10T | 508890 4869217 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 1560 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.5  | Submergent                                      | 10 |
| Maximum Depth (m)       | 1.2  | Emergent  | 20 |
| Water Temperature (C)   | 20   | Floating  | 0  |
| Percent Silt / Organics | 20   | Algae   | 5  |
|                         |      | <i>Total</i>                                    | 35 |

**Native Fish Species Collected:**

|                           |          |
|---------------------------|----------|
| Oregon Chub               | <b>0</b> |
| Cottids                   | 46       |
| Speckled Dace             | 27       |
| Redside Shiners           | 20       |
| Northern Pikeminnows      | 19       |
| Largescale Suckers        | 9        |
| Sand Rollers              | 1        |
| Threespine Sticklebacks   | 12       |
| Salmonids <sup>2</sup> CT | 1        |
| Lamprey                   |          |
| Chiselmouth               |          |

**Non-native Fish Species Collected:**

|                      |    |
|----------------------|----|
| Western Mosquitofish | 40 |
| Bullheads            | 1  |
| Common Carp          |    |
| Bluegills            | 25 |
| Largemouth Bass      |    |
| Pumpkinseeds         |    |
| Crappies             |    |
| Smallmouth Bass      |    |
| Banded Killifish     |    |

**Other:**

**NOTE:** POP EST, FLOODPLAIN SITE

Appendix A (continued).

MIDDLE FORK WILLAMETTE RIVER BASIN

|           |                              |                    |                |         |
|-----------|------------------------------|--------------------|----------------|---------|
| Site Name | <b>SIMPSON SLOUGH</b>        | Map Code           | <b>SIMP1C*</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER | Sampling Date      | 9/29/2015      |         |
| Subbasin  | FALL CREEK                   | Location: Zone 10T | 514955         | 4866429 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 1080 |
| Average Depth (m)       | 0.25 |
| Maximum Depth (m)       | 0.5  |
| Water Temperature (C)   | 10   |
| Percent Silt / Organics | 20   |

|   |    |
|---|----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Submergent                                      | 15 |
| Emergent  | 0  |
| Floating  | 0  |
| Algae   | 40 |
| <i>Total</i>                                    | 45 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>2</b> |
| Cottids                 | 9        |
| Speckled Dace           | 9        |
| Redside Shiners         | 4        |
| Northern Pikeminnows    |          |
| Largescale Suckers      | 1        |
| Sand Rollers            |          |
| Threespine Sticklebacks |          |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 | 1        |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** POOLS AT MOUTH AND UPS, P. LAMP

|           |                              |                    |              |         |
|-----------|------------------------------|--------------------|--------------|---------|
| Site Name | <b>SWAN FARM BAYOU</b>       | Map Code           | <b>SWAN1</b> |         |
| Basin     | MIDDLE FORK WILLAMETTE RIVER | Sampling Date      | 5/20/2015    |         |
| Subbasin  | LOST CREEK                   | Location: Zone 10T | 511740       | 4866109 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 1000 |
| Average Depth (m)       | 0.75 |
| Maximum Depth (m)       | 1    |
| Water Temperature (C)   |      |
| Percent Silt / Organics | 80   |

|   |     |
|---|-----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |     |
| Submergent                                      | 60  |
| Emergent  | 30  |
| Floating  | 0   |
| Algae   | 10  |
| <i>Total</i>                                    | 100 |

**Native Fish Species Collected:**

|                         |           |
|-------------------------|-----------|
| Oregon Chub             | <b>47</b> |
| Cottids                 |           |
| Speckled Dace           | 56        |
| Redside Shiners         |           |
| Northern Pikeminnows    |           |
| Largescale Suckers      |           |
| Sand Rollers            |           |
| Threespine Sticklebacks | 7         |
| Salmonids <sup>2</sup>  |           |
| Lamprey                 |           |
| Chiselmouth             |           |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** POP EST, DOWNSTREAM LOCATION

Appendix A (continued).

MIDDLE FORK WILLAMETTE RIVER BASIN

|           |                              |                    |                |
|-----------|------------------------------|--------------------|----------------|
| Site Name | <b>SWAN FARM UPSTREAM</b>    | Map Code           | <b>SWAN2</b>   |
| Basin     | MIDDLE FORK WILLAMETTE RIVER | Sampling Date      | 5/20/2015      |
| Subbasin  | LOST CREEK                   | Location: Zone 10T | 511693 4866111 |

---

|                         |      |   |     |
|-------------------------|------|---|-----|
| Surface Area (m2)       | 1000 | <b>Types of aquatic vegetation <sup>1</sup></b> |     |
| Average Depth (m)       | 0.75 | Submergent                                      | 60  |
| Maximum Depth (m)       | 1    | Emergent  | 30  |
| Water Temperature (C)   |      | Floating  | 0   |
| Percent Silt / Organics | 80   | Algae   | 10  |
|                         |      | <i>Total</i>                                    | 100 |

|                                       |           |   |  |
|---------------------------------------|-----------|---|--|
| <b>Native Fish Species Collected:</b> |           | <b>Non-native Fish Species Collected:</b> |  |
| Oregon Chub                           | <b>77</b> | Western Mosquitofish                      |  |
| Cottids                               |           | Bullheads                                 |  |
| Speckled Dace                         | 63        | Common Carp                               |  |
| Redside Shiners                       |           | Bluegills                                 |  |
| Northern Pikeminnows                  |           | Largemouth Bass                           |  |
| Largescale Suckers                    |           | Pumpkinseeds                              |  |
| Sand Rollers                          |           | Crappies                                  |  |
| Threespine Sticklebacks               | 216       | Smallmouth Bass                           |  |
| Salmonids <sup>2</sup>                |           | Banded Killifish                          |  |
| Lamprey                               |           |   |  |
| Chiselmouth                           |           |   |  |

**Other:**

**NOTE:** POP EST, UPSTREAM LOCATION



Appendix A (continued).

MID-WILLAMETTE RIVER BASIN

|           |                         |                    |             |         |
|-----------|-------------------------|--------------------|-------------|---------|
| Site Name | <b>BSWCD GRAVEL PIT</b> | Map Code           | <b>BGP1</b> |         |
| Basin     | MID-WILLAMETTE RIVER    | Sampling Date      | 7/28/2015   |         |
| Subbasin  |                         | Location: Zone 10T | 485901      | 4940722 |

|                         |      |   |     |  |
|-------------------------|------|---|-----|--|
| Surface Area (m2)       | 8000 | <b>Types of aquatic vegetation <sup>1</sup></b> |     |  |
| Average Depth (m)       | 1    | Submergent                                      | 60  |  |
| Maximum Depth (m)       | 3    | Emergent  | 40  |  |
| Water Temperature (C)   | 17   | Floating  | 0   |  |
| Percent Silt / Organics | 100  | Algae   | 0   |  |
|                         |      | <i>Total</i>                                    | 100 |  |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 |          |
| Speckled Dace           |          |
| Redside Shiners         |          |
| Northern Pikeminnows    |          |
| Largescale Suckers      | 1        |
| Sand Rollers            |          |
| Threespine Sticklebacks |          |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |      |
|----------------------|------|
| Western Mosquitofish | 1000 |
| Bullheads            | 1    |
| Common Carp          | 1    |
| Bluegills            | 47   |
| Largemouth Bass      | 5    |
| Pumpkinseeds         |      |
| Crappies             | 1    |
| Smallmouth Bass      |      |
| Banded Killifish     |      |

**Other:** YP=1

**NOTE:** BSWCD PROJECT SITE, PRE-RESTORATION

|           |                        |                    |              |         |
|-----------|------------------------|--------------------|--------------|---------|
| Site Name | <b>DRY MUDDY CREEK</b> | Map Code           | <b>DMC6B</b> |         |
| Basin     | MID-WILLAMETTE RIVER   | Sampling Date      | 2/25/2015    |         |
| Subbasin  | EAST MUDDY CREEK       | Location: Zone 10T | 491269       | 4898063 |

|                         |     |   |  |  |
|-------------------------|-----|---|--|--|
| Surface Area (m2)       | 100 | <b>Types of aquatic vegetation <sup>1</sup></b> |  |  |
| Average Depth (m)       |     | Submergent                                      |  |  |
| Maximum Depth (m)       |     | Emergent  |  |  |
| Water Temperature (C)   |     | Floating  |  |  |
| Percent Silt / Organics |     | Algae   |  |  |
|                         |     | <i>Total</i>                                    |  |  |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>2</b> |
| Cottids                 |          |
| Speckled Dace           |          |
| Redside Shiners         |          |
| Northern Pikeminnows    |          |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks |          |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |  |
|----------------------|--|
| Western Mosquitofish |  |
| Bullheads            |  |
| Common Carp          |  |
| Bluegills            |  |
| Largemouth Bass      |  |
| Pumpkinseeds         |  |
| Crappies             |  |
| Smallmouth Bass      |  |
| Banded Killifish     |  |

**Other:**

**NOTE:** ALEX FARRAND, ODFW DISTRICT SAMPLING

Appendix A (continued).

MID-WILLAMETTE RIVER BASIN

|           |                           |                    |                |         |
|-----------|---------------------------|--------------------|----------------|---------|
| Site Name | <b>DUNN WETLAND DUNN2</b> | Map Code           | <b>DUNN2V*</b> |         |
| Basin     | MID-WILLAMETTE RIVER      | Sampling Date      | 9/1/2015       |         |
| Subbasin  | MARYS RIVER               | Location: Zone 10T | 470249         | 4921916 |

|                         |      |   |     |
|-------------------------|------|---|-----|
| Surface Area (m2)       | 2240 | <b>Types of aquatic vegetation <sup>1</sup></b> |     |
| Average Depth (m)       | 0.5  | Submergent                                      | 90  |
| Maximum Depth (m)       | 1    | Emergent  | 10  |
| Water Temperature (C)   | 20   | Floating  | 0   |
| Percent Silt / Organics | 100  | Algae   | 0   |
|                         |      | <i>Total</i>                                    | 100 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>200</b> |
| Cottids                 |            |
| Speckled Dace           |            |
| Redside Shiners         |            |
| Northern Pikeminnows    |            |
| Largescale Suckers      |            |
| Sand Rollers            |            |
| Threespine Sticklebacks |            |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 |            |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** REINTRO, SW, CHECKED FOR LO

|           |                           |                    |                |         |
|-----------|---------------------------|--------------------|----------------|---------|
| Site Name | <b>DUNN WETLAND DUNN6</b> | Map Code           | <b>DUNN6P*</b> |         |
| Basin     | MID-WILLAMETTE RIVER      | Sampling Date      | 9/1/2015       |         |
| Subbasin  | MARYS RIVER               | Location: Zone 10T | 470249         | 4921836 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 880  | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.15 | Submergent                                      | 20 |
| Maximum Depth (m)       | 0.25 | Emergent  | 20 |
| Water Temperature (C)   | 20   | Floating  | 0  |
| Percent Silt / Organics | 100  | Algae   | 0  |
|                         |      | <i>Total</i>                                    | 40 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>200</b> |
| Cottids                 |            |
| Speckled Dace           |            |
| Redside Shiners         |            |
| Northern Pikeminnows    |            |
| Largescale Suckers      |            |
| Sand Rollers            |            |
| Threespine Sticklebacks |            |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 |            |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** INTRO, NW, V. LOW, MANY JUV. TO SW, SE

Appendix A (continued).

MID-WILLAMETTE RIVER BASIN

|           |                           |                    |                |         |
|-----------|---------------------------|--------------------|----------------|---------|
| Site Name | <b>DUNN WETLAND DUNN7</b> | Map Code           | <b>DUNN7M*</b> |         |
| Basin     | MID-WILLAMETTE RIVER      | Sampling Date      | 9/1/2015       |         |
| Subbasin  | MARYS RIVER               | Location: Zone 10T | 470299         | 4921916 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 3500 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 1    | Submergent                                      | 30 |
| Maximum Depth (m)       | 2    | Emergent  | 30 |
| Water Temperature (C)   | 20   | Floating  | 0  |
| Percent Silt / Organics | 100  | Algae   | 5  |
|                         |      | <i>Total</i>                                    | 65 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>600</b> |
| Cottids                 |            |
| Speckled Dace           |            |
| Redside Shiners         |            |
| Northern Pikeminnows    |            |
| Largescale Suckers      |            |
| Sand Rollers            |            |
| Threespine Sticklebacks |            |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 |            |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** REINTRO, SE, CHECKED FOR LO

|           |                       |                    |              |         |
|-----------|-----------------------|--------------------|--------------|---------|
| Site Name | <b>FAIRCHILD POND</b> | Map Code           | <b>FAIR1</b> |         |
| Basin     | MID-WILLAMETTE RIVER  | Sampling Date      | 4/23/2015    |         |
| Subbasin  | MARYS RIVER           | Location: Zone 10T | 463216       | 4926448 |

|                         |     |   |     |
|-------------------------|-----|---|-----|
| Surface Area (m2)       | 500 | <b>Types of aquatic vegetation <sup>1</sup></b> |     |
| Average Depth (m)       | 0.5 | Submergent                                      | 80  |
| Maximum Depth (m)       | 2   | Emergent  | 20  |
| Water Temperature (C)   | 12  | Floating  |     |
| Percent Silt / Organics | 90  | Algae   |     |
|                         |     | <i>Total</i>                                    | 100 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>150</b> |
| Cottids                 |            |
| Speckled Dace           |            |
| Redside Shiners         |            |
| Northern Pikeminnows    |            |
| Largescale Suckers      |            |
| Sand Rollers            |            |
| Threespine Sticklebacks |            |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 |            |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** REINTRODUCTION

Appendix A (continued).

MID-WILLAMETTE RIVER BASIN

|           |                               |                    |               |         |
|-----------|-------------------------------|--------------------|---------------|---------|
| Site Name | <b>FINLEY NWR BEAVER POND</b> | Map Code           | <b>FIN1S*</b> |         |
| Basin     | MID-WILLAMETTE RIVER          | Sampling Date      | 10/2/2015     |         |
| Subbasin  | MARYS RIVER                   | Location: Zone 10T | 473847        | 4916139 |

|                         |      |   |     |  |
|-------------------------|------|---|-----|--|
| Surface Area (m2)       | 4400 | <b>Types of aquatic vegetation <sup>1</sup></b> |     |  |
| Average Depth (m)       | 0.2  | Submergent                                      | 10  |  |
| Maximum Depth (m)       | 0.5  | Emergent  | 80  |  |
| Water Temperature (C)   |      | Floating  |     |  |
| Percent Silt / Organics | 100  | Algae   | 10  |  |
|                         |      | <i>Total</i>                                    | 100 |  |

**Native Fish Species Collected:**

|                         |           |
|-------------------------|-----------|
| Oregon Chub             | <b>10</b> |
| Cottids                 |           |
| Speckled Dace           | 10        |
| Redside Shiners         | 20        |
| Northern Pikeminnows    |           |
| Largescale Suckers      |           |
| Sand Rollers            |           |
| Threespine Sticklebacks | 10        |
| Salmonids <sup>2</sup>  |           |
| Lamprey                 |           |
| Chiselmouth             |           |

**Non-native Fish Species Collected:**

|                      |    |
|----------------------|----|
| Western Mosquitofish |    |
| Bullheads            | 10 |
| Common Carp          |    |
| Bluegills            |    |
| Largemouth Bass      |    |
| Pumpkinseeds         |    |
| Crappies             |    |
| Smallmouth Bass      |    |
| Banded Killifish     |    |

**Other:**

**NOTE:** P/A, JAPANESE BIOS VISIT, LOW WATER

|           |                                |                    |               |         |
|-----------|--------------------------------|--------------------|---------------|---------|
| Site Name | <b>FINLEY NWR DISPLAY POND</b> | Map Code           | <b>FIN16W</b> |         |
| Basin     | MID-WILLAMETTE RIVER           | Sampling Date      | 2/17/2015     |         |
| Subbasin  | MARYS RIVER                    | Location: Zone 10T | 473386        | 4917139 |

|                         |      |   |    |  |
|-------------------------|------|---|----|--|
| Surface Area (m2)       | 9900 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |  |
| Average Depth (m)       | 1    | Submergent                                      | 20 |  |
| Maximum Depth (m)       | 2.5  | Emergent  | 40 |  |
| Water Temperature (C)   | 14   | Floating  | 0  |  |
| Percent Silt / Organics | 100  | Algae   | 0  |  |
|                         |      | <i>Total</i>                                    | 60 |  |

**Native Fish Species Collected:**

|                         |           |
|-------------------------|-----------|
| Oregon Chub             | <b>10</b> |
| Cottids                 |           |
| Speckled Dace           |           |
| Redside Shiners         |           |
| Northern Pikeminnows    |           |
| Largescale Suckers      |           |
| Sand Rollers            |           |
| Threespine Sticklebacks |           |
| Salmonids <sup>2</sup>  |           |
| Lamprey                 |           |
| Chiselmouth             |           |

**Non-native Fish Species Collected:**

|                      |  |
|----------------------|--|
| Western Mosquitofish |  |
| Bullheads            |  |
| Common Carp          |  |
| Bluegills            |  |
| Largemouth Bass      |  |
| Pumpkinseeds         |  |
| Crappies             |  |
| Smallmouth Bass      |  |
| Banded Killifish     |  |

**Other:**

**NOTE:** P/A, DELISTING EVENT

Appendix A (continued).

MID-WILLAMETTE RIVER BASIN

|           |                                     |                    |               |         |
|-----------|-------------------------------------|--------------------|---------------|---------|
| Site Name | <b>FINLEY NWR- GRAY CREEK SWAMP</b> | Map Code           | <b>FIN4V*</b> |         |
| Basin     | MID-WILLAMETTE RIVER                | Sampling Date      | 10/2/2015     |         |
| Subbasin  | MARYS RIVER                         | Location: Zone 10T | 472649        | 4915908 |

|                         |       |   |     |
|-------------------------|-------|---|-----|
| Surface Area (m2)       | 22872 | <b>Types of aquatic vegetation <sup>1</sup></b> |     |
| Average Depth (m)       | 0.5   | Submergent                                      | 40  |
| Maximum Depth (m)       | 0.7   | Emergent  | 35  |
| Water Temperature (C)   |       | Floating  | 0   |
| Percent Silt / Organics | 100   | Algae   | 15  |
|                         |       | <i>Total</i>                                    | 100 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>5</b> |
| Cottids                 |          |
| Speckled Dace           | 10       |
| Redside Shiners         | 10       |
| Northern Pikeminnows    |          |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks | 5        |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** P/A, MID AREA, JAPANESE VISIT, LOW WATER

|           |                           |                    |              |         |
|-----------|---------------------------|--------------------|--------------|---------|
| Site Name | <b>FINLEY-BUFORD POND</b> | Map Code           | <b>FBP1A</b> |         |
| Basin     | MID-WILLAMETTE RIVER      | Sampling Date      | 4/23/2015    |         |
| Subbasin  | MARYS RIVER               | Location: Zone 10T | 472351       | 4926239 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 2500 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 1    | Submergent                                      | 40 |
| Maximum Depth (m)       | 1.8  | Emergent  | 20 |
| Water Temperature (C)   | 18   | Floating  | 0  |
| Percent Silt / Organics | 100  | Algae   | 15 |
|                         |      | <i>Total</i>                                    | 75 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>800</b> |
| Cottids                 |            |
| Speckled Dace           |            |
| Redside Shiners         |            |
| Northern Pikeminnows    |            |
| Largescale Suckers      |            |
| Sand Rollers            |            |
| Threespine Sticklebacks |            |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 |            |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** 2011 REINTRODUCTION SITE, P/A

Appendix A (continued).

MID-WILLAMETTE RIVER BASIN

|           |                           |                    |              |         |
|-----------|---------------------------|--------------------|--------------|---------|
| Site Name | <b>FINLEY-BUFORD POND</b> | Map Code           | <b>FBP1C</b> |         |
| Basin     | MID-WILLAMETTE RIVER      | Sampling Date      | 10/2/2015    |         |
| Subbasin  | MARYS RIVER               | Location: Zone 10T | 472351       | 4926239 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 2500 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 1    | Submergent                                      | 40 |
| Maximum Depth (m)       | 1.8  | Emergent  | 20 |
| Water Temperature (C)   | 20   | Floating  | 0  |
| Percent Silt / Organics | 100  | Algae   | 15 |
|                         |      | <i>Total</i>                                    | 75 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>500</b> |
| Cottids                 |            |
| Speckled Dace           |            |
| Redside Shiners         |            |
| Northern Pikeminnows    |            |
| Largescale Suckers      |            |
| Sand Rollers            |            |
| Threespine Sticklebacks |            |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 |            |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** 2011 REINTRODUCTION SITE, P/A

|           |                      |                    |               |         |
|-----------|----------------------|--------------------|---------------|---------|
| Site Name | <b>JONT CREEK</b>    | Map Code           | <b>JONT1D</b> |         |
| Basin     | MID-WILLAMETTE RIVER | Sampling Date      | 4/16/2015     |         |
| Subbasin  | LUCKIAMUTE RIVER     | Location: Zone 10T | 474315        | 4957763 |

|                         |     |   |    |
|-------------------------|-----|---|----|
| Surface Area (m2)       | 50  | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.5 | Submergent                                      | 30 |
| Maximum Depth (m)       | 0.7 | Emergent  | 30 |
| Water Temperature (C)   | 9.5 | Floating  | 10 |
| Percent Silt / Organics | 90  | Algae   | 10 |
|                         |     | <i>Total</i>                                    | 80 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>3</b> |
| Cottids                 | 5        |
| Speckled Dace           | 5        |
| Redside Shiners         | 46       |
| Northern Pikeminnows    | 1        |
| Largescale Suckers      | 10       |
| Sand Rollers            |          |
| Threespine Sticklebacks | 370      |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** SIMPS RD BRIDGE, FLOODED, P/A DIPNET

Appendix A (continued).

MID-WILLAMETTE RIVER BASIN

|           |                                       |                    |               |         |
|-----------|---------------------------------------|--------------------|---------------|---------|
| Site Name | <b>JONT CREEK- AUER CULVERT POOLS</b> | Map Code           | <b>JONT3A</b> |         |
| Basin     | MID-WILLAMETTE RIVER                  | Sampling Date      | 4/16/2015     |         |
| Subbasin  | LUCKIAMUTE RIVER                      | Location: Zone 10T | 476589        | 4958749 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 1200 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.8  | Submergent                                      | 20 |
| Maximum Depth (m)       | 1.3  | Emergent  | 60 |
| Water Temperature (C)   | 9.5  | Floating  | 0  |
| Percent Silt / Organics | 100  | Algae   | 10 |
|                         |      | <i>Total</i>                                    | 90 |

**Native Fish Species Collected:**

|                                  |    |
|----------------------------------|----|
| Oregon Chub                      | 1  |
| Cottids                          | 19 |
| Speckled Dace                    | 16 |
| Redside Shiners                  | 39 |
| Northern Pikeminnows             | 1  |
| Largescale Suckers               |    |
| Sand Rollers                     |    |
| Threespine Sticklebacks          | 42 |
| Salmonids <sup>2</sup> 10=CO 2=C | 12 |
| Lamprey                          |    |
| Chiselmouth                      |    |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** BV DAM DOWN TO TREELINE, CHINOOK, COHO

|           |                                       |                    |              |         |
|-----------|---------------------------------------|--------------------|--------------|---------|
| Site Name | <b>JONT CREEK MOUTH THROUGH WOODS</b> | Map Code           | <b>JONT6</b> |         |
| Basin     | MID-WILLAMETTE RIVER                  | Sampling Date      | 4/16/2015    |         |
| Subbasin  | LUCKIAMUTE RIVER                      | Location: Zone 10T | 474827       | 4957895 |

|                         |     |   |    |
|-------------------------|-----|---|----|
| Surface Area (m2)       | 800 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.8 | Submergent                                      | 10 |
| Maximum Depth (m)       | 1.3 | Emergent  | 10 |
| Water Temperature (C)   | 9.5 | Floating  | 0  |
| Percent Silt / Organics | 20  | Algae   | 0  |
|                         |     | <i>Total</i>                                    | 20 |

**Native Fish Species Collected:**

|                           |     |
|---------------------------|-----|
| Oregon Chub               | 0   |
| Cottids                   | 5   |
| Speckled Dace             | 50  |
| Redside Shiners           | 100 |
| Northern Pikeminnows      | 1   |
| Largescale Suckers        | 25  |
| Sand Rollers              | 2   |
| Threespine Sticklebacks   |     |
| Salmonids <sup>2</sup> CT | 1   |
| Lamprey                   |     |
| Chiselmouth               |     |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** P/A SAMPLING, LARGE CT

Appendix A (continued).

MID-WILLAMETTE RIVER BASIN

|           |                            |                    |               |         |
|-----------|----------------------------|--------------------|---------------|---------|
| Site Name | <b>JONT CREEK UPS POOL</b> | Map Code           | <b>JONT1D</b> |         |
| Basin     | MID-WILLAMETTE RIVER       | Sampling Date      | 4/16/2015     |         |
| Subbasin  | LUCKIAMUTE RIVER           | Location: Zone 10T | 474491        | 4957575 |

|                         |      |   |     |  |
|-------------------------|------|---|-----|--|
| Surface Area (m2)       | 1000 | <b>Types of aquatic vegetation <sup>1</sup></b> |     |  |
| Average Depth (m)       | 0.3  | Submergent                                      | 50  |  |
| Maximum Depth (m)       | 0.5  | Emergent  | 50  |  |
| Water Temperature (C)   | 9.5  | Floating  | 0   |  |
| Percent Silt / Organics | 100  | Algae   | 0   |  |
|                         |      | <i>Total</i>                                    | 100 |  |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 |          |
| Speckled Dace           |          |
| Redside Shiners         |          |
| Northern Pikeminnows    |          |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks |          |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:** NO FISH

**NOTE:** UPS SIMP BRIDGE, LIKELY EPHEMERAL

|           |                         |                    |                  |         |
|-----------|-------------------------|--------------------|------------------|---------|
| Site Name | <b>SAM DAWS LANDING</b> | Map Code           | <b>SAMDAWS4*</b> |         |
| Basin     | MID-WILLAMETTE RIVER    | Sampling Date      | 9/2/2015         |         |
| Subbasin  |                         | Location: Zone 10T | 482219           | 4917171 |

|                         |  |   |  |  |
|-------------------------|--|---|--|--|
| Surface Area (m2)       |  | <b>Types of aquatic vegetation <sup>1</sup></b> |  |  |
| Average Depth (m)       |  | Submergent                                      |  |  |
| Maximum Depth (m)       |  | Emergent  |  |  |
| Water Temperature (C)   |  | Floating  |  |  |
| Percent Silt / Organics |  | Algae   |  |  |
|                         |  | <i>Total</i>                                    |  |  |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 |          |
| Speckled Dace           |          |
| Redside Shiners         |          |
| Northern Pikeminnows    | <b>9</b> |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks | <b>3</b> |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:** GREEN=1

**NOTE:** PRE-RESTORATION LOCATION, LTWC



Appendix A (continued).

MID-WILLAMETTE RIVER BASIN

|           |                         |                    |                  |         |
|-----------|-------------------------|--------------------|------------------|---------|
| Site Name | <b>SAM DAWS LANDING</b> | Map Code           | <b>SAMDAWS3*</b> |         |
| Basin     | MID-WILLAMETTE RIVER    | Sampling Date      | 9/2/2015         |         |
| Subbasin  |                         | Location: Zone 10T | 482535           | 4917627 |

|                                       |          |   |  |            |
|---------------------------------------|----------|---|--|------------|
| Surface Area (m2)                     |          | <b>Types of aquatic vegetation <sup>1</sup></b> |  |            |
| Average Depth (m)                     |          | Submergent                                      |  |            |
| Maximum Depth (m)                     |          | Emergent  |  |            |
| Water Temperature (C)                 |          | Floating  |  |            |
| Percent Silt / Organics               |          | Algae   |  |            |
|                                       |          | <i>Total</i>                                    |  |            |
| <b>Native Fish Species Collected:</b> |          | <b>Non-native Fish Species Collected:</b>       |  |            |
| Oregon Chub                           | <b>0</b> | Western Mosquitofish                            |  |            |
| Cottids                               |          | Bullheads                                       |  | 61         |
| Speckled Dace                         |          | Common Carp                                     |  |            |
| Redside Shiners                       | 2        | Bluegills                                       |  | 39         |
| Northern Pikeminnows                  | 17       | Largemouth Bass                                 |  |            |
| Largescale Suckers                    | 3        | Pumpkinseeds                                    |  |            |
| Sand Rollers                          |          | Crappies  |  |            |
| Threespine Sticklebacks               | 3        | Smallmouth Bass                                 |  |            |
| Salmonids <sup>2</sup>                |          | Banded Killifish                                |  |            |
| Lamprey                               |          |   |  |            |
| Chiselmouth                           | 2        |   |  |            |
|                                       |          | <b>Other:</b>                                   |  | GN=3,WM=22 |

**NOTE:** PRE-REST LOCATION, LTWC, BBH & YBH

|           |                                      |                    |                |         |
|-----------|--------------------------------------|--------------------|----------------|---------|
| Site Name | <b>SCHMEDDING BEAVER CREEK SWAMP</b> | Map Code           | <b>SCHMED1</b> |         |
| Basin     | MID-WILLAMETTE RIVER                 | Sampling Date      | 4/23/2015      |         |
| Subbasin  | MARYS RIVER                          | Location: Zone 10T | 467189         | 4920417 |

|                                       |            |   |  |    |
|---------------------------------------|------------|---|--|----|
| Surface Area (m2)                     | 1200       | <b>Types of aquatic vegetation <sup>1</sup></b> |  |    |
| Average Depth (m)                     | 0.5        | Submergent                                      |  | 10 |
| Maximum Depth (m)                     | 1.5        | Emergent  |  | 60 |
| Water Temperature (C)                 | 12         | Floating  |  |    |
| Percent Silt / Organics               | 50         | Algae   |  |    |
|                                       |            | <i>Total</i>                                    |  | 70 |
| <b>Native Fish Species Collected:</b> |            | <b>Non-native Fish Species Collected:</b>       |  |    |
| Oregon Chub                           | <b>150</b> | Western Mosquitofish                            |  |    |
| Cottids                               |            | Bullheads                                       |  |    |
| Speckled Dace                         |            | Common Carp                                     |  |    |
| Redside Shiners                       |            | Bluegills                                       |  |    |
| Northern Pikeminnows                  |            | Largemouth Bass                                 |  |    |
| Largescale Suckers                    |            | Pumpkinseeds                                    |  |    |
| Sand Rollers                          |            | Crappies  |  |    |
| Threespine Sticklebacks               |            | Smallmouth Bass                                 |  |    |
| Salmonids <sup>2</sup>                |            | Banded Killifish                                |  |    |
| Lamprey                               |            |   |  |    |
| Chiselmouth                           |            |   |  |    |
|                                       |            | <b>Other:</b>                                   |  |    |

**NOTE:** REINTRODUCTION, LARGE BEAVER POND

Appendix A (continued).

**SANTIAM RIVER BASIN**

|           |                    |                    |               |         |
|-----------|--------------------|--------------------|---------------|---------|
| Site Name | <b>ALDER CREEK</b> | Map Code           | <b>ALDER1</b> |         |
| Basin     | SANTIAM RIVER      | Sampling Date      | 6/25/2015     |         |
| Subbasin  | NORTH SANTIAM      | Location: Zone 10T | 521147        | 4960166 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 2000 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.25 | Submergent                                      | 20 |
| Maximum Depth (m)       | 1    | Emergent  | 20 |
| Water Temperature (C)   | 25   | Floating  | 15 |
| Percent Silt / Organics | 60   | Algae   | 5  |
|                         |      | <i>Total</i>                                    | 60 |

**Native Fish Species Collected:**

|                         |   |
|-------------------------|---|
| Oregon Chub             | 1 |
| Cottids                 |   |
| Speckled Dace           |   |
| Redside Shiners         | 5 |
| Northern Pikeminnows    | 1 |
| Largescale Suckers      | 1 |
| Sand Rollers            |   |
| Threespine Sticklebacks |   |
| Salmonids <sup>2</sup>  |   |
| Lamprey                 |   |
| Chiselmouth             |   |

**Non-native Fish Species Collected:**

|                      |    |
|----------------------|----|
| Western Mosquitofish |    |
| Bullheads            |    |
| Common Carp          |    |
| Bluegills            |    |
| Largemouth Bass      |    |
| Pumpkinseeds         | 40 |
| Crappies             |    |
| Smallmouth Bass      |    |
| Banded Killifish     |    |

**Other:**

**NOTE:** DRIVEWAY UPSTREAM, DAY SET

|           |                         |                    |             |         |
|-----------|-------------------------|--------------------|-------------|---------|
| Site Name | <b>BIRDHAVEN SLOUGH</b> | Map Code           | <b>BH1A</b> |         |
| Basin     | SANTIAM RIVER           | Sampling Date      | 6/15/2015   |         |
| Subbasin  | NORTH SANTIAM           | Location: Zone 10T | 521285      | 4959235 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 7000 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.75 | Submergent                                      | 35 |
| Maximum Depth (m)       | 1.5  | Emergent  | 40 |
| Water Temperature (C)   | 20   | Floating  | 0  |
| Percent Silt / Organics | 60   | Algae   | 5  |
|                         |      | <i>Total</i>                                    | 80 |

**Native Fish Species Collected:**

|                             |             |
|-----------------------------|-------------|
| Oregon Chub                 | <b>5981</b> |
| Cottids                     | 20          |
| Speckled Dace               | 268         |
| Redside Shiners             | 809         |
| Northern Pikeminnows        | 112         |
| Largescale Suckers          | 102         |
| Sand Rollers                |             |
| Threespine Sticklebacks     |             |
| Salmonids <sup>2</sup> CO=2 | 2           |
| Lamprey                     | 5           |
| Chiselmouth                 |             |

**Non-native Fish Species Collected:**

|                      |   |
|----------------------|---|
| Western Mosquitofish |   |
| Bullheads            |   |
| Common Carp          |   |
| Bluegills            |   |
| Largemouth Bass      |   |
| Pumpkinseeds         | 1 |
| Crappies             |   |
| Smallmouth Bass      |   |
| Banded Killifish     |   |

**Other:**

**NOTE:** POP. EST., OTTERS, REST. 2016 AFTER EST

Appendix A (continued).

**SANTIAM RIVER BASIN**

|           |                      |                    |               |         |
|-----------|----------------------|--------------------|---------------|---------|
| Site Name | <b>BOOMER SLOUGH</b> | Map Code           | <b>BOOM1A</b> |         |
| Basin     | SANTIAM RIVER        | Sampling Date      | 6/17/2015     |         |
| Subbasin  | NORTH SANTIAM        | Location: Zone 10T | 516421        | 4959578 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 1200 |
| Average Depth (m)       | 0.35 |
| Maximum Depth (m)       | 1    |
| Water Temperature (C)   |      |
| Percent Silt / Organics | 70   |

**Types of aquatic vegetation <sup>1</sup>**

|              |    |
|--------------|----|
| Submergent   | 90 |
| Emergent     | 5  |
| Floating     | 0  |
| Algae        | 0  |
| <i>Total</i> | 95 |

**Native Fish Species Collected:**

|                           |          |
|---------------------------|----------|
| Oregon Chub               | <b>0</b> |
| Cottids                   | 15       |
| Speckled Dace             | 30       |
| Redside Shiners           |          |
| Northern Pikeminnows      | 5        |
| Largescale Suckers        |          |
| Sand Rollers              |          |
| Threespine Sticklebacks   | 60       |
| Salmonids <sup>2</sup> CO | 1        |
| Lamprey                   |          |
| Chiselmouth               |          |

**Non-native Fish Species Collected:**

|                      |  |
|----------------------|--|
| Western Mosquitofish |  |
| Bullheads            |  |
| Common Carp          |  |
| Bluegills            |  |
| Largemouth Bass      |  |
| Pumpkinseeds         |  |
| Crappies             |  |
| Smallmouth Bass      |  |
| Banded Killifish     |  |

**Other:**

**NOTE:** SE OF STAYTON RD BRIDGE

|           |                                 |                    |              |         |
|-----------|---------------------------------|--------------------|--------------|---------|
| Site Name | <b>BUELL MILLER PARK SLOUGH</b> | Map Code           | <b>BMP1D</b> |         |
| Basin     | SANTIAM RIVER                   | Sampling Date      | 6/1/2015     |         |
| Subbasin  | NORTH SANTIAM                   | Location: Zone 10T | 512252       | 4957301 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 5250 |
| Average Depth (m)       | 1    |
| Maximum Depth (m)       | 2    |
| Water Temperature (C)   | 19   |
| Percent Silt / Organics | 20   |

**Types of aquatic vegetation <sup>1</sup>**

|              |    |
|--------------|----|
| Submergent   | 50 |
| Emergent     | 30 |
| Floating     | 0  |
| Algae        | 10 |
| <i>Total</i> | 90 |

**Native Fish Species Collected:**

|                                   |            |
|-----------------------------------|------------|
| Oregon Chub                       | <b>731</b> |
| Cottids                           | 730        |
| Speckled Dace                     | 12         |
| Redside Shiners                   | 1336       |
| Northern Pikeminnows              | 182        |
| Largescale Suckers                | 196        |
| Sand Rollers                      |            |
| Threespine Sticklebacks           | 3561       |
| Salmonids <sup>2</sup> CO=3, ST=1 | 4          |
| Lamprey                           |            |
| Chiselmouth                       |            |

**Non-native Fish Species Collected:**

|                      |     |
|----------------------|-----|
| Western Mosquitofish |     |
| Bullheads            | 1   |
| Common Carp          |     |
| Bluegills            | 5   |
| Largemouth Bass      |     |
| Pumpkinseeds         | 128 |
| Crappies             |     |
| Smallmouth Bass      |     |
| Banded Killifish     |     |

**Other:**

**NOTE:** POP EST

Appendix A (continued).

**SANTIAM RIVER BASIN**

|           |                                       |                    |               |         |
|-----------|---------------------------------------|--------------------|---------------|---------|
| Site Name | <b>CHAHALPAM (WARREN GRAY) SLOUGH</b> | Map Code           | <b>GRAY1Q</b> |         |
| Basin     | SANTIAM RIVER                         | Sampling Date      | 6/1/2015      |         |
| Subbasin  | NORTH SANTIAM                         | Location: Zone 10T | 513224        | 4957493 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 6600 |
| Average Depth (m)       | 0.5  |
| Maximum Depth (m)       | 1.5  |
| Water Temperature (C)   | 19   |
| Percent Silt / Organics | 90   |

|   |    |
|---|----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Submergent                                      | 60 |
| Emergent  | 30 |
| Floating  | 0  |
| Algae   | 5  |
| <i>Total</i>                                    | 95 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>678</b> |
| Cottids                 | 373        |
| Speckled Dace           | 48         |
| Redside Shiners         | 130        |
| Northern Pikeminnows    | 47         |
| Largescale Suckers      | 4          |
| Sand Rollers            |            |
| Threespine Sticklebacks | 2163       |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 |            |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |      |
|----------------------|------|
| Western Mosquitofish |      |
| Bullheads            |      |
| Common Carp          |      |
| Bluegills            | 7    |
| Largemouth Bass      |      |
| Pumpkinseeds         | 7943 |
| Crappies             |      |
| Smallmouth Bass      |      |
| Banded Killifish     |      |

**Other:**

**NOTE:** POPULATION ESTIMATE

|           |                       |                    |               |         |
|-----------|-----------------------|--------------------|---------------|---------|
| Site Name | <b>CRABTREE CREEK</b> | Map Code           | <b>CRAB1*</b> |         |
| Basin     | SANTIAM RIVER         | Sampling Date      | 9/10/2015     |         |
| Subbasin  | SOUTH SANTIAM         | Location: Zone 10T | 508693        | 4944228 |

|                         |     |
|-------------------------|-----|
| Surface Area (m2)       | 800 |
| Average Depth (m)       | 0.5 |
| Maximum Depth (m)       | 1.5 |
| Water Temperature (C)   |     |
| Percent Silt / Organics | 30  |

|   |    |
|---|----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Submergent                                      | 10 |
| Emergent  | 10 |
| Floating  | 0  |
| Algae   | 20 |
| <i>Total</i>                                    | 40 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 |          |
| Speckled Dace           |          |
| Redside Shiners         |          |
| Northern Pikeminnows    |          |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks |          |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |    |
|----------------------|----|
| Western Mosquitofish | 20 |
| Bullheads            |    |
| Common Carp          |    |
| Bluegills            |    |
| Largemouth Bass      |    |
| Pumpkinseeds         |    |
| Crappies             |    |
| Smallmouth Bass      | 3  |
| Banded Killifish     |    |

**Other:**

**NOTE:** DAY SET, POOR HABITAT FOR CHUB

Appendix A (continued).

**SANTIAM RIVER BASIN**

|           |                         |                    |              |         |
|-----------|-------------------------|--------------------|--------------|---------|
| Site Name | <b>ECK SIDE CHANNEL</b> | Map Code           | <b>NS10A</b> |         |
| Basin     | SANTIAM RIVER           | Sampling Date      | 6/22/2015    |         |
| Subbasin  | NORTH SANTIAM           | Location: Zone 10T | 512500       | 4958527 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 5400 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.5  | Submergent                                      | 40 |
| Maximum Depth (m)       | 1.75 | Emergent  | 20 |
| Water Temperature (C)   | 15   | Floating  | 0  |
| Percent Silt / Organics | 20   | Algae   | 5  |
|                         |      | <i>Total</i>                                    | 65 |

**Native Fish Species Collected:**

|                         |           |
|-------------------------|-----------|
| Oregon Chub             | <b>43</b> |
| Cottids                 | 1458      |
| Speckled Dace           | 265       |
| Redside Shiners         | 1974      |
| Northern Pikeminnows    |           |
| Largescale Suckers      | 2         |
| Sand Rollers            |           |
| Threespine Sticklebacks | 3893      |
| Salmonids <sup>2</sup>  |           |
| Lamprey                 | 1         |
| Chiselmouth             |           |

**Non-native Fish Species Collected:**

|                      |   |
|----------------------|---|
| Western Mosquitofish |   |
| Bullheads            |   |
| Common Carp          |   |
| Bluegills            |   |
| Largemouth Bass      |   |
| Pumpkinseeds         | 4 |
| Crappies             |   |
| Smallmouth Bass      |   |
| Banded Killifish     |   |

**Other:**

**NOTE:** PUMP STATION/BV DAM TO BRAID

|           |                |                    |             |         |
|-----------|----------------|--------------------|-------------|---------|
| Site Name | <b>FENLAKE</b> | Map Code           | <b>FEN1</b> |         |
| Basin     | SANTIAM RIVER  | Sampling Date      | 7/24/2015   |         |
| Subbasin  | SOUTH SANTIAM  | Location: Zone 10T | 517407      | 4923577 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 4000 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.25 | Submergent                                      | 40 |
| Maximum Depth (m)       | 0.5  | Emergent  | 50 |
| Water Temperature (C)   | 25   | Floating  | 0  |
| Percent Silt / Organics | 100  | Algae   | 0  |
|                         |      | <i>Total</i>                                    | 90 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 |          |
| Speckled Dace           |          |
| Redside Shiners         |          |
| Northern Pikeminnows    |          |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks |          |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |       |
|----------------------|-------|
| Western Mosquitofish | 10000 |
| Bullheads            | 80    |
| Common Carp          |       |
| Bluegills            |       |
| Largemouth Bass      |       |
| Pumpkinseeds         |       |
| Crappies             |       |
| Smallmouth Bass      |       |
| Banded Killifish     |       |

**Other:**

**NOTE:** LARGE SHALLOW LAKE, NATIVE PLANTS

Appendix A (continued).

**SANTIAM RIVER BASIN**

|           |                            |                    |              |         |
|-----------|----------------------------|--------------------|--------------|---------|
| Site Name | <b>FOSTER PULLOUT POND</b> | Map Code           | <b>FOS2U</b> |         |
| Basin     | SANTIAM RIVER              | Sampling Date      | 4/6/2015     |         |
| Subbasin  | SOUTH SANTIAM              | Location: Zone 10T | 529165       | 4918350 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 1500 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 1    | Submergent                                      | 60 |
| Maximum Depth (m)       | 1.7  | Emergent  | 15 |
| Water Temperature (C)   | 8    | Floating  | 10 |
| Percent Silt / Organics | 100  | Algae   | 10 |
|                         |      | <i>Total</i>                                    | 95 |

**Native Fish Species Collected:**

|                         |             |
|-------------------------|-------------|
| Oregon Chub             | <b>5054</b> |
| Cottids                 |             |
| Speckled Dace           |             |
| Redside Shiners         |             |
| Northern Pikeminnows    |             |
| Largescale Suckers      |             |
| Sand Rollers            |             |
| Threespine Sticklebacks |             |
| Salmonids <sup>2</sup>  |             |
| Lamprey                 |             |
| Chiselmouth             |             |

**Non-native Fish Species Collected:**

|                      |  |
|----------------------|--|
| Western Mosquitofish |  |
| Bullheads            |  |
| Common Carp          |  |
| Bluegills            |  |
| Largemouth Bass      |  |
| Pumpkinseeds         |  |
| Crappies             |  |
| Smallmouth Bass      |  |
| Banded Killifish     |  |

**Other:**

**NOTE:** INTRODUCTION SITE, POP EST.

|           |                                   |                    |              |         |
|-----------|-----------------------------------|--------------------|--------------|---------|
| Site Name | <b>GEREN ISLAND NORTH CHANNEL</b> | Map Code           | <b>GER4T</b> |         |
| Basin     | SANTIAM RIVER                     | Sampling Date      | 4/13/2015    |         |
| Subbasin  | NORTH SANTIAM                     | Location: Zone 10T | 519371       | 4959900 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 2700 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 1    | Submergent                                      | 40 |
| Maximum Depth (m)       | 1.5  | Emergent  | 20 |
| Water Temperature (C)   | 12   | Floating  | 0  |
| Percent Silt / Organics | 70   | Algae   | 5  |
|                         |      | <i>Total</i>                                    | 65 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>614</b> |
| Cottids                 | 915        |
| Speckled Dace           | 229        |
| Redside Shiners         | 1364       |
| Northern Pikeminnows    | 2          |
| Largescale Suckers      | 1          |
| Sand Rollers            |            |
| Threespine Sticklebacks |            |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 |            |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |     |
|----------------------|-----|
| Western Mosquitofish |     |
| Bullheads            |     |
| Common Carp          |     |
| Bluegills            | 649 |
| Largemouth Bass      |     |
| Pumpkinseeds         |     |
| Crappies             |     |
| Smallmouth Bass      |     |
| Banded Killifish     |     |

**Other:**

**NOTE:** POP EST, MICROHAB STUDY SUMMER 14, VIE

Appendix A (continued).

**SANTIAM RIVER BASIN**

|           |                                 |                    |              |         |
|-----------|---------------------------------|--------------------|--------------|---------|
| Site Name | <b>GREEN'S BRIDGE BACKWATER</b> | Map Code           | <b>NS14U</b> |         |
| Basin     | SANTIAM RIVER                   | Sampling Date      | 5/11/2015    |         |
| Subbasin  | NORTH SANTIAM                   | Location: Zone 10T | 502354       | 4950367 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 1200 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.5  | Submergent                                      | 50 |
| Maximum Depth (m)       | 1.5  | Emergent  | 10 |
| Water Temperature (C)   | 15   | Floating  | 0  |
| Percent Silt / Organics | 85   | Algae   | 10 |
|                         |      | <i>Total</i>                                    | 80 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>688</b> |
| Cottids                 | 150        |
| Speckled Dace           | 10         |
| Redside Shiners         | 358        |
| Northern Pikeminnows    | 8          |
| Largescale Suckers      | 108        |
| Sand Rollers            |            |
| Threespine Sticklebacks | 732        |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 |            |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |     |
|----------------------|-----|
| Western Mosquitofish |     |
| Bullheads            |     |
| Common Carp          |     |
| Bluegills            | 54  |
| Largemouth Bass      |     |
| Pumpkinseeds         | 109 |
| Crappies             |     |
| Smallmouth Bass      |     |
| Banded Killifish     |     |

**Other:**

**NOTE:** POPULATION ESTIMATE

|           |                      |                    |                 |         |
|-----------|----------------------|--------------------|-----------------|---------|
| Site Name | <b>HARRIS SLOUGH</b> | Map Code           | <b>HARRIS1D</b> |         |
| Basin     | SANTIAM RIVER        | Sampling Date      | 6/3/2015        |         |
| Subbasin  | NORTH SANTIAM        | Location: Zone 10T | 500010          | 4948467 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 1500 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.5  | Submergent                                      | 30 |
| Maximum Depth (m)       | 1.5  | Emergent  | 20 |
| Water Temperature (C)   | 20   | Floating  | 0  |
| Percent Silt / Organics | 80   | Algae   | 10 |
|                         |      | <i>Total</i>                                    | 60 |

**Native Fish Species Collected:**

|                         |           |
|-------------------------|-----------|
| Oregon Chub             | <b>49</b> |
| Cottids                 |           |
| Speckled Dace           | 5         |
| Redside Shiners         | 190       |
| Northern Pikeminnows    | 46        |
| Largescale Suckers      | 9         |
| Sand Rollers            |           |
| Threespine Sticklebacks |           |
| Salmonids <sup>2</sup>  |           |
| Lamprey                 |           |
| Chiselmouth             | 2         |

**Non-native Fish Species Collected:**

|                      |     |
|----------------------|-----|
| Western Mosquitofish |     |
| Bullheads            | 4   |
| Common Carp          |     |
| Bluegills            | 27  |
| Largemouth Bass      |     |
| Pumpkinseeds         | 150 |
| Crappies             |     |
| Smallmouth Bass      |     |
| Banded Killifish     |     |

**Other:** PM=1

**NOTE:** ACROSS FROM SCEA, DOWN DRY CHNL, P/A

Appendix A (continued).

**SANTIAM RIVER BASIN**

|           |                                       |                    |                |         |
|-----------|---------------------------------------|--------------------|----------------|---------|
| Site Name | <b>HATCH AIRPORT - POOL NEAR MOUT</b> | Map Code           | <b>HATCH1*</b> |         |
| Basin     | SANTIAM RIVER                         | Sampling Date      | 9/9/2015       |         |
| Subbasin  | NORTH SANTIAM                         | Location: Zone 10T | 511924         | 4957715 |

|                         |     |   |     |
|-------------------------|-----|---|-----|
| Surface Area (m2)       | 500 | <b>Types of aquatic vegetation <sup>1</sup></b> |     |
| Average Depth (m)       | 0.5 | Submergent                                      | 30  |
| Maximum Depth (m)       | 0.6 | Emergent  | 60  |
| Water Temperature (C)   | 17  | Floating  | 0   |
| Percent Silt / Organics | 80  | Algae   | 10  |
|                         |     | <i>Total</i>                                    | 100 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 |          |
| Speckled Dace           |          |
| Redside Shiners         |          |
| Northern Pikeminnows    | 4        |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks | 5        |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |     |
|----------------------|-----|
| Western Mosquitofish |     |
| Bullheads            |     |
| Common Carp          |     |
| Bluegills            | 278 |
| Largemouth Bass      |     |
| Pumpkinseeds         | 17  |
| Crappies             |     |
| Smallmouth Bass      |     |
| Banded Killifish     |     |

**Other:**

**NOTE:** IMPOUNDMENT, LOOKS GREAT DESPITE BG

|           |                                     |                    |                |         |
|-----------|-------------------------------------|--------------------|----------------|---------|
| Site Name | <b>HATCH AIRPORT GREENWOOD POND</b> | Map Code           | <b>HATCH2*</b> |         |
| Basin     | SANTIAM RIVER                       | Sampling Date      | 9/9/2015       |         |
| Subbasin  | NORTH SANTIAM                       | Location: Zone 10T | 511550         | 4957419 |

|                         |     |   |    |
|-------------------------|-----|---|----|
| Surface Area (m2)       | 600 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.5 | Submergent                                      | 5  |
| Maximum Depth (m)       | 1   | Emergent  | 15 |
| Water Temperature (C)   | 17  | Floating  | 0  |
| Percent Silt / Organics | 100 | Algae   | 35 |
|                         |     | <i>Total</i>                                    | 55 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>2</b> |
| Cottids                 | 8        |
| Speckled Dace           | 4        |
| Redside Shiners         |          |
| Northern Pikeminnows    |          |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks | 10       |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |   |
|----------------------|---|
| Western Mosquitofish |   |
| Bullheads            |   |
| Common Carp          |   |
| Bluegills            | 7 |
| Largemouth Bass      |   |
| Pumpkinseeds         |   |
| Crappies             |   |
| Smallmouth Bass      |   |
| Banded Killifish     |   |

**Other:**

**NOTE:** POND, CONNECTS SEASONALLY TO CHANNEL



Appendix A (continued).

**SANTIAM RIVER BASIN**

|           |                                   |                    |                |         |
|-----------|-----------------------------------|--------------------|----------------|---------|
| Site Name | <b>HATCH AIRPORT SIDE CHANNEL</b> | Map Code           | <b>HATCH3*</b> |         |
| Basin     | SANTIAM RIVER                     | Sampling Date      | 9/9/2015       |         |
| Subbasin  | NORTH SANTIAM                     | Location: Zone 10T | 511697         | 4956587 |

|                         |     |   |    |
|-------------------------|-----|---|----|
| Surface Area (m2)       | 640 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.7 | Submergent                                      | 60 |
| Maximum Depth (m)       | 1.6 | Emergent  | 15 |
| Water Temperature (C)   | 19  | Floating  | 5  |
| Percent Silt / Organics | 35  | Algae   | 5  |
|                         |     | <i>Total</i>                                    | 85 |

**Native Fish Species Collected:**

|                         |           |
|-------------------------|-----------|
| Oregon Chub             | <b>31</b> |
| Cottids                 | 17        |
| Speckled Dace           | 153       |
| Redside Shiners         | 163       |
| Northern Pikeminnows    | 1         |
| Largescale Suckers      | 1         |
| Sand Rollers            |           |
| Threespine Sticklebacks | 105       |
| Salmonids <sup>2</sup>  |           |
| Lamprey                 |           |
| Chiselmouth             |           |

**Non-native Fish Species Collected:**

|                      |   |
|----------------------|---|
| Western Mosquitofish |   |
| Bullheads            |   |
| Common Carp          |   |
| Bluegills            | 3 |
| Largemouth Bass      |   |
| Pumpkinseeds         | 2 |
| Crappies             |   |
| Smallmouth Bass      |   |
| Banded Killifish     |   |

**Other:**

**NOTE:** NR CLVRT & IRR WELL, E CHNL, RED VIE

|           |                                   |                    |                |         |
|-----------|-----------------------------------|--------------------|----------------|---------|
| Site Name | <b>HATCH AIRPORT SIDE CHANNEL</b> | Map Code           | <b>HATCH5*</b> |         |
| Basin     | SANTIAM RIVER                     | Sampling Date      | 9/9/2015       |         |
| Subbasin  | NORTH SANTIAM                     | Location: Zone 10T | 511783         | 4956968 |

|                         |     |   |    |
|-------------------------|-----|---|----|
| Surface Area (m2)       | 300 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.5 | Submergent                                      | 50 |
| Maximum Depth (m)       | 1.8 | Emergent  | 15 |
| Water Temperature (C)   | 18  | Floating  | 0  |
| Percent Silt / Organics | 30  | Algae   | 10 |
|                         |     | <i>Total</i>                                    | 75 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 | 21       |
| Speckled Dace           | 31       |
| Redside Shiners         |          |
| Northern Pikeminnows    | 10       |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks |          |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |   |
|----------------------|---|
| Western Mosquitofish |   |
| Bullheads            |   |
| Common Carp          |   |
| Bluegills            | 2 |
| Largemouth Bass      |   |
| Pumpkinseeds         |   |
| Crappies             |   |
| Smallmouth Bass      |   |
| Banded Killifish     |   |

**Other:**

**NOTE:** OTHER CHANNEL CC, WEST NR RIVER, MOVING

Appendix A (continued).

**SANTIAM RIVER BASIN**

|           |                                   |                    |                |         |
|-----------|-----------------------------------|--------------------|----------------|---------|
| Site Name | <b>HATCH AIRPORT SIDE CHANNEL</b> | Map Code           | <b>HATCH6*</b> |         |
| Basin     | SANTIAM RIVER                     | Sampling Date      | 9/9/2015       |         |
| Subbasin  | NORTH SANTIAM                     | Location: Zone 10T | 511693         | 4956426 |

|                         |      |   |    |  |
|-------------------------|------|---|----|--|
| Surface Area (m2)       | 400  | <b>Types of aquatic vegetation <sup>1</sup></b> |    |  |
| Average Depth (m)       | 0.25 | Submergent                                      | 10 |  |
| Maximum Depth (m)       | 0.4  | Emergent  | 10 |  |
| Water Temperature (C)   | 24   | Floating  | 0  |  |
| Percent Silt / Organics | 10   | Algae   | 10 |  |
|                         |      | <i>Total</i>                                    | 30 |  |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 | 3        |
| Speckled Dace           |          |
| Redside Shiners         |          |
| Northern Pikeminnows    |          |
| Largescale Suckers      | 1        |
| Sand Rollers            |          |
| Threespine Sticklebacks | 5        |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |   |
|----------------------|---|
| Western Mosquitofish |   |
| Bullheads            |   |
| Common Carp          |   |
| Bluegills            | 2 |
| Largemouth Bass      |   |
| Pumpkinseeds         | 4 |
| Crappies             |   |
| Smallmouth Bass      |   |
| Banded Killifish     |   |

**Other:**

**NOTE:** EAST CHANNEL MOUTH TO LARGER SLOUGH

|           |                                   |                    |                |         |
|-----------|-----------------------------------|--------------------|----------------|---------|
| Site Name | <b>HATCH AIRPORT SIDE CHANNEL</b> | Map Code           | <b>HATCH4*</b> |         |
| Basin     | SANTIAM RIVER                     | Sampling Date      | 9/9/2015       |         |
| Subbasin  | NORTH SANTIAM                     | Location: Zone 10T | 511473         | 4956521 |

|                         |      |   |    |  |
|-------------------------|------|---|----|--|
| Surface Area (m2)       | 1000 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |  |
| Average Depth (m)       | 0.7  | Submergent                                      | 50 |  |
| Maximum Depth (m)       | 1.7  | Emergent  | 15 |  |
| Water Temperature (C)   | 18   | Floating  | 5  |  |
| Percent Silt / Organics | 40   | Algae   | 10 |  |
|                         |      | <i>Total</i>                                    | 80 |  |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 | 13       |
| Speckled Dace           | 24       |
| Redside Shiners         | 57       |
| Northern Pikeminnows    | 2        |
| Largescale Suckers      | 1        |
| Sand Rollers            |          |
| Threespine Sticklebacks | 42       |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |    |
|----------------------|----|
| Western Mosquitofish |    |
| Bullheads            |    |
| Common Carp          |    |
| Bluegills            | 11 |
| Largemouth Bass      |    |
| Pumpkinseeds         | 1  |
| Crappies             |    |
| Smallmouth Bass      |    |
| Banded Killifish     |    |

**Other:**

**NOTE:** MIDDLE POOLS, LOWER CHNL, BV DAM

Appendix A (continued).

**SANTIAM RIVER BASIN**

|           |                                   |                    |                |         |
|-----------|-----------------------------------|--------------------|----------------|---------|
| Site Name | <b>HATCH AIRPORT SIDE CHANNEL</b> | Map Code           | <b>HATCH7*</b> |         |
| Basin     | SANTIAM RIVER                     | Sampling Date      | 9/9/2015       |         |
| Subbasin  | NORTH SANTIAM                     | Location: Zone 10T | 511125         | 4956448 |

|                         |      |   |     |
|-------------------------|------|---|-----|
| Surface Area (m2)       | 1000 | <b>Types of aquatic vegetation <sup>1</sup></b> |     |
| Average Depth (m)       | 0.5  | Submergent                                      | 60  |
| Maximum Depth (m)       | 1    | Emergent  | 20  |
| Water Temperature (C)   | 18   | Floating  | 10  |
| Percent Silt / Organics | 30   | Algae   | 10  |
|                         |      | <i>Total</i>                                    | 100 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 | 21       |
| Speckled Dace           | 16       |
| Redside Shiners         | 25       |
| Northern Pikeminnows    |          |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks | 28       |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |   |
|----------------------|---|
| Western Mosquitofish |   |
| Bullheads            |   |
| Common Carp          |   |
| Bluegills            | 2 |
| Largemouth Bass      |   |
| Pumpkinseeds         |   |
| Crappies             |   |
| Smallmouth Bass      |   |
| Banded Killifish     |   |

**Other:**

**NOTE:** LOWEST DOWNSTREAM POND IN CHNL, MOVING

|           |                                   |                    |                |         |
|-----------|-----------------------------------|--------------------|----------------|---------|
| Site Name | <b>HATCH AIRPORT SIDE CHANNEL</b> | Map Code           | <b>HATCH8*</b> |         |
| Basin     | SANTIAM RIVER                     | Sampling Date      | 9/9/2015       |         |
| Subbasin  | NORTH SANTIAM                     | Location: Zone 10T | 511587         | 4957413 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 300  | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.5  | Submergent                                      | 20 |
| Maximum Depth (m)       | 0.7  | Emergent  | 40 |
| Water Temperature (C)   | 16.5 | Floating  | 0  |
| Percent Silt / Organics | 20   | Algae   | 10 |
|                         |      | <i>Total</i>                                    | 70 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 | 8        |
| Speckled Dace           | 9        |
| Redside Shiners         | 18       |
| Northern Pikeminnows    | 12       |
| Largescale Suckers      | 1        |
| Sand Rollers            |          |
| Threespine Sticklebacks | 2        |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |   |
|----------------------|---|
| Western Mosquitofish |   |
| Bullheads            |   |
| Common Carp          |   |
| Bluegills            | 2 |
| Largemouth Bass      |   |
| Pumpkinseeds         |   |
| Crappies             |   |
| Smallmouth Bass      |   |
| Banded Killifish     |   |

**Other:**

**NOTE:** SMALL CHANNEL, MOST INLAND CHANNEL, FAST

Appendix A (continued).

**SANTIAM RIVER BASIN**

|           |                                   |                    |                |         |
|-----------|-----------------------------------|--------------------|----------------|---------|
| Site Name | <b>HATCH AIRPORT SIDE CHANNEL</b> | Map Code           | <b>HATCH9*</b> |         |
| Basin     | SANTIAM RIVER                     | Sampling Date      | 9/9/2015       |         |
| Subbasin  | NORTH SANTIAM                     | Location: Zone 10T | 511741         | 4957479 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 500  | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.3  | Submergent                                      | 0  |
| Maximum Depth (m)       | 0.75 | Emergent  | 20 |
| Water Temperature (C)   | 16   | Floating  | 0  |
| Percent Silt / Organics | 0    | Algae   | 0  |
|                         |      | <i>Total</i>                                    | 20 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 | 1        |
| Speckled Dace           | 8        |
| Redside Shiners         | 9        |
| Northern Pikeminnows    | 1        |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks | 1        |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |  |
|----------------------|--|
| Western Mosquitofish |  |
| Bullheads            |  |
| Common Carp          |  |
| Bluegills            |  |
| Largemouth Bass      |  |
| Pumpkinseeds         |  |
| Crappies             |  |
| Smallmouth Bass      |  |
| Banded Killifish     |  |

**Other:**

**NOTE:** HATCH AIRPORT TO GREENWOOD BC, FAST

|           |                                   |                    |                 |         |
|-----------|-----------------------------------|--------------------|-----------------|---------|
| Site Name | <b>HATCH AIRPORT SIDE CHANNEL</b> | Map Code           | <b>HATCH10*</b> |         |
| Basin     | SANTIAM RIVER                     | Sampling Date      | 9/9/2015        |         |
| Subbasin  | NORTH SANTIAM                     | Location: Zone 10T | 511873          | 4957720 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 3000 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.75 | Submergent                                      | 20 |
| Maximum Depth (m)       | 1.75 | Emergent  | 30 |
| Water Temperature (C)   | 16.5 | Floating  | 0  |
| Percent Silt / Organics | 10   | Algae   | 10 |
|                         |      | <i>Total</i>                                    | 60 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 | 11       |
| Speckled Dace           | 15       |
| Redside Shiners         | 7        |
| Northern Pikeminnows    | 2        |
| Largescale Suckers      | 3        |
| Sand Rollers            |          |
| Threespine Sticklebacks | 21       |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |    |
|----------------------|----|
| Western Mosquitofish |    |
| Bullheads            |    |
| Common Carp          |    |
| Bluegills            | 38 |
| Largemouth Bass      |    |
| Pumpkinseeds         | 1  |
| Crappies             |    |
| Smallmouth Bass      |    |
| Banded Killifish     |    |

**Other:**

**NOTE:** MOUTH DOWNSTREAM TO GREENWOOD PROP

Appendix A (continued).

**SANTIAM RIVER BASIN**

|           |                      |                    |               |         |
|-----------|----------------------|--------------------|---------------|---------|
| Site Name | <b>KOENIG SLOUGH</b> | Map Code           | <b>COLD1C</b> |         |
| Basin     | SANTIAM RIVER        | Sampling Date      | 6/23/2015     |         |
| Subbasin  | NORTH SANTIAM        | Location: Zone 10T | 507892        | 4954522 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 800  |
| Average Depth (m)       | 0.25 |
| Maximum Depth (m)       | 0.5  |
| Water Temperature (C)   | 9.5  |
| Percent Silt / Organics | 100  |

|   |    |
|---|----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Submergent                                      | 15 |
| Emergent  | 30 |
| Floating  | 0  |
| Algae   | 5  |
| <i>Total</i>                                    | 50 |

**Native Fish Species Collected:**

|                         |             |
|-------------------------|-------------|
| Oregon Chub             | <b>1370</b> |
| Cottids                 | 2156        |
| Speckled Dace           | 3           |
| Redside Shiners         |             |
| Northern Pikeminnows    |             |
| Largescale Suckers      |             |
| Sand Rollers            |             |
| Threespine Sticklebacks | 1761        |
| Salmonids <sup>2</sup>  |             |
| Lamprey                 |             |
| Chiselmouth             |             |

**Non-native Fish Species Collected:**

|                      |   |
|----------------------|---|
| Western Mosquitofish |   |
| Bullheads            |   |
| Common Carp          |   |
| Bluegills            |   |
| Largemouth Bass      |   |
| Pumpkinseeds         | 2 |
| Crappies             |   |
| Smallmouth Bass      |   |
| Banded Killifish     |   |

**Other:**

**NOTE:** POP EST, NEAR RIVER, VIE RED

|           |                     |                    |              |         |
|-----------|---------------------|--------------------|--------------|---------|
| Site Name | <b>LOGAN SLOUGH</b> | Map Code           | <b>NS17E</b> |         |
| Basin     | SANTIAM RIVER       | Sampling Date      | 6/22/2015    |         |
| Subbasin  | NORTH SANTIAM       | Location: Zone 10T | 508304       | 4955223 |

|                         |     |
|-------------------------|-----|
| Surface Area (m2)       | 500 |
| Average Depth (m)       | 0.5 |
| Maximum Depth (m)       | 1   |
| Water Temperature (C)   | 12  |
| Percent Silt / Organics | 70  |

|   |    |
|---|----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Submergent                                      | 30 |
| Emergent  | 35 |
| Floating  | 15 |
| Algae   | 10 |
| <i>Total</i>                                    | 90 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 | 19       |
| Speckled Dace           | 15       |
| Redside Shiners         | 8        |
| Northern Pikeminnows    |          |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks | 50       |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 | 1        |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |  |
|----------------------|--|
| Western Mosquitofish |  |
| Bullheads            |  |
| Common Carp          |  |
| Bluegills            |  |
| Largemouth Bass      |  |
| Pumpkinseeds         |  |
| Crappies             |  |
| Smallmouth Bass      |  |
| Banded Killifish     |  |

**Other:**

**NOTE:** LOWER REACH, DNS GATE, NEAR RIVER

Appendix A (continued).

**SANTIAM RIVER BASIN**

|           |                     |                    |              |         |
|-----------|---------------------|--------------------|--------------|---------|
| Site Name | <b>LOWER KOENIG</b> | Map Code           | <b>COLD5</b> |         |
| Basin     | SANTIAM RIVER       | Sampling Date      | 6/22/2015    |         |
| Subbasin  | NORTH SANTIAM       | Location: Zone 10T | 507959       | 4954276 |

|                         |      |   |     |
|-------------------------|------|---|-----|
| Surface Area (m2)       | 2250 | <b>Types of aquatic vegetation <sup>1</sup></b> |     |
| Average Depth (m)       | 0.5  | Submergent                                      | 20  |
| Maximum Depth (m)       | 1.25 | Emergent  | 70  |
| Water Temperature (C)   | 18   | Floating  |     |
| Percent Silt / Organics | 60   | Algae   | 10  |
|                         |      | <i>Total</i>                                    | 100 |

**Native Fish Species Collected:**

|                           |           |
|---------------------------|-----------|
| Oregon Chub               | <b>21</b> |
| Cottids                   | 323       |
| Speckled Dace             | 48        |
| Redside Shiners           | 34        |
| Northern Pikeminnows      | 40        |
| Largescale Suckers        | 21        |
| Sand Rollers              |           |
| Threespine Sticklebacks   | 647       |
| Salmonids <sup>2</sup> CO | 1         |
| Lamprey                   |           |
| Chiselmouth               |           |

**Non-native Fish Species Collected:**

|                      |    |
|----------------------|----|
| Western Mosquitofish |    |
| Bullheads            |    |
| Common Carp          |    |
| Bluegills            |    |
| Largemouth Bass      |    |
| Pumpkinseeds         | 14 |
| Crappies             |    |
| Smallmouth Bass      |    |
| Banded Killifish     |    |

**Other:** PM=1

**NOTE:** POP EST, LOWER OF 3 SITES, NEW 15

|           |                      |                    |                 |         |
|-----------|----------------------|--------------------|-----------------|---------|
| Site Name | <b>MEHAMA SLOUGH</b> | Map Code           | <b>MEHAMA1F</b> |         |
| Basin     | SANTIAM RIVER        | Sampling Date      | 5/26/2015       |         |
| Subbasin  | NORTH SANTIAM        | Location: Zone 10T | 528138          | 4958745 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 2000 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.5  | Submergent                                      | 40 |
| Maximum Depth (m)       | 1.5  | Emergent  | 25 |
| Water Temperature (C)   | 17   | Floating  | 0  |
| Percent Silt / Organics | 15   | Algae   | 15 |
|                         |      | <i>Total</i>                                    | 80 |

**Native Fish Species Collected:**

|                         |             |
|-------------------------|-------------|
| Oregon Chub             | <b>1026</b> |
| Cottids                 | 468         |
| Speckled Dace           | 11          |
| Redside Shiners         | 158         |
| Northern Pikeminnows    | 451         |
| Largescale Suckers      | 907         |
| Sand Rollers            |             |
| Threespine Sticklebacks |             |
| Salmonids <sup>2</sup>  |             |
| Lamprey                 |             |
| Chiselmouth             |             |

**Non-native Fish Species Collected:**

|                      |    |
|----------------------|----|
| Western Mosquitofish |    |
| Bullheads            | 4  |
| Common Carp          |    |
| Bluegills            | 85 |
| Largemouth Bass      |    |
| Pumpkinseeds         |    |
| Crappies             |    |
| Smallmouth Bass      |    |
| Banded Killifish     |    |

**Other:**

**NOTE:** 2 BVR PONDS IN EST, VIE YELLOW

Appendix A (continued).

**SANTIAM RIVER BASIN**

|           |                      |                    |              |         |
|-----------|----------------------|--------------------|--------------|---------|
| Site Name | <b>MIDDLE KOENIG</b> | Map Code           | <b>COLD4</b> |         |
| Basin     | SANTIAM RIVER        | Sampling Date      | 6/22/2015    |         |
| Subbasin  | NORTH SANTIAM        | Location: Zone 10T | 508172       | 4954431 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 3900 |
| Average Depth (m)       | 0.5  |
| Maximum Depth (m)       | 2    |
| Water Temperature (C)   | 15   |
| Percent Silt / Organics | 60   |

**Types of aquatic vegetation <sup>1</sup>**

|              |    |
|--------------|----|
| Submergent   | 20 |
| Emergent     | 20 |
| Floating     | 0  |
| Algae        | 5  |
| <i>Total</i> | 45 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>251</b> |
| Cottids                 | 569        |
| Speckled Dace           | 102        |
| Redside Shiners         | 985        |
| Northern Pikeminnows    | 3          |
| Largescale Suckers      | 2          |
| Sand Rollers            |            |
| Threespine Sticklebacks | 1368       |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 |            |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |     |
|----------------------|-----|
| Western Mosquitofish |     |
| Bullheads            |     |
| Common Carp          |     |
| Bluegills            |     |
| Largemouth Bass      |     |
| Pumpkinseeds         | 139 |
| Crappies             |     |
| Smallmouth Bass      |     |
| Banded Killifish     |     |

**Other:**

**NOTE:** POP EST, MIDDLE OF 3 SITES, NEW 15

|           |                           |                    |               |         |
|-----------|---------------------------|--------------------|---------------|---------|
| Site Name | <b>NORTH STAYTON POND</b> | Map Code           | <b>STAY2G</b> |         |
| Basin     | SANTIAM RIVER             | Sampling Date      | 4/7/2015      |         |
| Subbasin  | NORTH SANTIAM             | Location: Zone 10T | 515710        | 4959225 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 1575 |
| Average Depth (m)       | 1.5  |
| Maximum Depth (m)       | 3.5  |
| Water Temperature (C)   | 9.5  |
| Percent Silt / Organics | 85   |

**Types of aquatic vegetation <sup>1</sup>**

|              |    |
|--------------|----|
| Submergent   | 20 |
| Emergent     | 20 |
| Floating     | 0  |
| Algae        | 10 |
| <i>Total</i> | 50 |

**Native Fish Species Collected:**

|                         |             |
|-------------------------|-------------|
| Oregon Chub             | <b>1094</b> |
| Cottids                 |             |
| Speckled Dace           |             |
| Redside Shiners         |             |
| Northern Pikeminnows    |             |
| Largescale Suckers      |             |
| Sand Rollers            |             |
| Threespine Sticklebacks |             |
| Salmonids <sup>2</sup>  |             |
| Lamprey                 |             |
| Chiselmouth             |             |

**Non-native Fish Species Collected:**

|                      |  |
|----------------------|--|
| Western Mosquitofish |  |
| Bullheads            |  |
| Common Carp          |  |
| Bluegills            |  |
| Largemouth Bass      |  |
| Pumpkinseeds         |  |
| Crappies             |  |
| Smallmouth Bass      |  |
| Banded Killifish     |  |

**Other:**

**NOTE:** INTRODUCTION, POP EST

Appendix A (continued).

**SANTIAM RIVER BASIN**

|           |                               |                    |               |         |
|-----------|-------------------------------|--------------------|---------------|---------|
| Site Name | <b>PIONEER PARK BACKWATER</b> | Map Code           | <b>PION3S</b> |         |
| Basin     | SANTIAM RIVER                 | Sampling Date      | 4/13/2015     |         |
| Subbasin  | NORTH SANTIAM                 | Location: Zone 10T | 516950        | 4960250 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 1300 |
| Average Depth (m)       | 0.5  |
| Maximum Depth (m)       | 1    |
| Water Temperature (C)   | 9    |
| Percent Silt / Organics | 55   |

**Types of aquatic vegetation <sup>1</sup>**

|              |    |
|--------------|----|
| Submergent   | 45 |
| Emergent     | 20 |
| Floating     | 0  |
| Algae        | 5  |
| <i>Total</i> | 70 |

**Native Fish Species Collected:**

|                           |             |
|---------------------------|-------------|
| Oregon Chub               | <b>2219</b> |
| Cottids                   | 119         |
| Speckled Dace             | 156         |
| Redside Shiners           | 18          |
| Northern Pikeminnows      |             |
| Largescale Suckers        |             |
| Sand Rollers              |             |
| Threespine Sticklebacks   |             |
| Salmonids <sup>2</sup> CH | 1           |
| Lamprey                   |             |
| Chiselmouth               |             |

**Non-native Fish Species Collected:**

|                      |  |
|----------------------|--|
| Western Mosquitofish |  |
| Bullheads            |  |
| Common Carp          |  |
| Bluegills            |  |
| Largemouth Bass      |  |
| Pumpkinseeds         |  |
| Crappies             |  |
| Smallmouth Bass      |  |
| Banded Killifish     |  |

**Other:**

**NOTE:** POPULATION ESTIMATE, LOW WATER SUMMER

|           |                                      |                    |                |         |
|-----------|--------------------------------------|--------------------|----------------|---------|
| Site Name | <b>SANTIAM CONS. EASEMENT SCE1-4</b> | Map Code           | <b>SCE1-4Q</b> |         |
| Basin     | SANTIAM RIVER                        | Sampling Date      | 6/2/2015       |         |
| Subbasin  | NORTH SANTIAM                        | Location: Zone 10T | 500303         | 4947762 |

|                         |       |
|-------------------------|-------|
| Surface Area (m2)       | 16300 |
| Average Depth (m)       | 0.75  |
| Maximum Depth (m)       | 2     |
| Water Temperature (C)   | 15    |
| Percent Silt / Organics | 100   |

**Types of aquatic vegetation <sup>1</sup>**

|              |    |
|--------------|----|
| Submergent   | 45 |
| Emergent     | 40 |
| Floating     | 0  |
| Algae        | 10 |
| <i>Total</i> | 90 |

**Native Fish Species Collected:**

|                           |            |
|---------------------------|------------|
| Oregon Chub               | <b>829</b> |
| Cottids                   | 5          |
| Speckled Dace             | 2          |
| Redside Shiners           | 13         |
| Northern Pikeminnows      | 77         |
| Largescale Suckers        | 1          |
| Sand Rollers              |            |
| Threespine Sticklebacks   | 2709       |
| Salmonids <sup>2</sup> CO | 1          |
| Lamprey                   |            |
| Chiselmouth               |            |

**Non-native Fish Species Collected:**

|                      |   |
|----------------------|---|
| Western Mosquitofish | 9 |
| Bullheads            |   |
| Common Carp          |   |
| Bluegills            | 1 |
| Largemouth Bass      |   |
| Pumpkinseeds         |   |
| Crappies             |   |
| Smallmouth Bass      |   |
| Banded Killifish     |   |

**Other:**

**NOTE:** POP EST, SCEA7 SCoured, FLOWING WATER



Appendix A (continued).

**SANTIAM RIVER BASIN**

|           |                                   |                    |               |         |
|-----------|-----------------------------------|--------------------|---------------|---------|
| Site Name | <b>SANTIAM I-5 OUTFLOW SLOUGH</b> | Map Code           | <b>I5BW3C</b> |         |
| Basin     | SANTIAM RIVER                     | Sampling Date      | 5/6/2015      |         |
| Subbasin  |                                   | Location: Zone 10T | 495899        | 4953723 |

|                         |     |   |    |
|-------------------------|-----|---|----|
| Surface Area (m2)       | 200 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.3 | Submergent                                      | 65 |
| Maximum Depth (m)       | 0.8 | Emergent  | 5  |
| Water Temperature (C)   | 9.5 | Floating  | 0  |
| Percent Silt / Organics | 25  | Algae   | 15 |
|                         |     | <i>Total</i>                                    | 85 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 |          |
| Speckled Dace           |          |
| Redside Shiners         | 2        |
| Northern Pikeminnows    | 19       |
| Largescale Suckers      | 13       |
| Sand Rollers            |          |
| Threespine Sticklebacks | 35       |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             | 8        |

**Non-native Fish Species Collected:**

|                      |  |
|----------------------|--|
| Western Mosquitofish |  |
| Bullheads            |  |
| Common Carp          |  |
| Bluegills            |  |
| Largemouth Bass      |  |
| Pumpkinseeds         |  |
| Crappies             |  |
| Smallmouth Bass      |  |
| Banded Killifish     |  |

**Other:**

**NOTE:** NEW POOL IN 2011, I5BW2 OUTFLOW

|           |                                      |                    |               |         |
|-----------|--------------------------------------|--------------------|---------------|---------|
| Site Name | <b>SANTIAM I-5 SIDE CHANNEL POND</b> | Map Code           | <b>I5BW2Q</b> |         |
| Basin     | SANTIAM RIVER                        | Sampling Date      | 5/6/2015      |         |
| Subbasin  |                                      | Location: Zone 10T | 496051        | 4953491 |

|                         |      |   |     |
|-------------------------|------|---|-----|
| Surface Area (m2)       | 6000 | <b>Types of aquatic vegetation <sup>1</sup></b> |     |
| Average Depth (m)       | 0.25 | Submergent                                      | 10  |
| Maximum Depth (m)       | 0.75 | Emergent  | 85  |
| Water Temperature (C)   | 13   | Floating  | 0   |
| Percent Silt / Organics | 50   | Algae   | 5   |
|                         |      | <i>Total</i>                                    | 100 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>4</b> |
| Cottids                 | 98       |
| Speckled Dace           |          |
| Redside Shiners         | 3097     |
| Northern Pikeminnows    | 1990     |
| Largescale Suckers      | 427      |
| Sand Rollers            |          |
| Threespine Sticklebacks | 152      |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             | 180      |

**Non-native Fish Species Collected:**

|                      |           |
|----------------------|-----------|
| Western Mosquitofish | <b>58</b> |
| Bullheads            |           |
| Common Carp          |           |
| Bluegills            | 5         |
| Largemouth Bass      |           |
| Pumpkinseeds         | 1180      |
| Crappies             |           |
| Smallmouth Bass      |           |
| Banded Killifish     |           |

**Other:**

YB2GF21YP3

**NOTE:** POP EST, 50% PARROT FEATHER, PM=92 EST

Appendix A (continued).

**SANTIAM RIVER BASIN**

|           |                               |                    |                |         |
|-----------|-------------------------------|--------------------|----------------|---------|
| Site Name | <b>SLOUGH S HATCH AIRPORT</b> | Map Code           | <b>SHTCH1*</b> |         |
| Basin     | SANTIAM RIVER                 | Sampling Date      | 9/9/2015       |         |
| Subbasin  | NORTH SANTIAM                 | Location: Zone 10T | 511976         | 4957054 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 6000 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.4  | Submergent                                      | 45 |
| Maximum Depth (m)       | 1.6  | Emergent  | 15 |
| Water Temperature (C)   | 21.5 | Floating  | 0  |
| Percent Silt / Organics | 20   | Algae   | 10 |
|                         |      | <i>Total</i>                                    | 70 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 | 5        |
| Speckled Dace           | 1        |
| Redside Shiners         | 2        |
| Northern Pikeminnows    | 10       |
| Largescale Suckers      | 8        |
| Sand Rollers            |          |
| Threespine Sticklebacks | 10       |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |    |
|----------------------|----|
| Western Mosquitofish |    |
| Bullheads            |    |
| Common Carp          |    |
| Bluegills            | 89 |
| Largemouth Bass      |    |
| Pumpkinseeds         | 17 |
| Crappies             |    |
| Smallmouth Bass      |    |
| Banded Killifish     |    |

**Other:**

**NOTE:** SEVERAL POOLS, MOUTH UPSTREAM ~200 M

|           |                           |                    |               |         |
|-----------|---------------------------|--------------------|---------------|---------|
| Site Name | <b>SOUTH STAYTON POND</b> | Map Code           | <b>STAY1J</b> |         |
| Basin     | SANTIAM RIVER             | Sampling Date      | 4/8/2015      |         |
| Subbasin  | NORTH SANTIAM             | Location: Zone 10T | 515525        | 4958950 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 1200 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 1.5  | Submergent                                      | 10 |
| Maximum Depth (m)       | 3.5  | Emergent  | 15 |
| Water Temperature (C)   | 12   | Floating  | 30 |
| Percent Silt / Organics | 75   | Algae   | 10 |
|                         |      | <i>Total</i>                                    | 65 |

**Native Fish Species Collected:**

|                         |            |
|-------------------------|------------|
| Oregon Chub             | <b>617</b> |
| Cottids                 |            |
| Speckled Dace           |            |
| Redside Shiners         |            |
| Northern Pikeminnows    |            |
| Largescale Suckers      |            |
| Sand Rollers            |            |
| Threespine Sticklebacks |            |
| Salmonids <sup>2</sup>  |            |
| Lamprey                 |            |
| Chiselmouth             |            |

**Non-native Fish Species Collected:**

|                      |      |
|----------------------|------|
| Western Mosquitofish | 1000 |
| Bullheads            |      |
| Common Carp          |      |
| Bluegills            |      |
| Largemouth Bass      |      |
| Pumpkinseeds         |      |
| Crappies             |      |
| Smallmouth Bass      |      |
| Banded Killifish     |      |

**Other:**

**NOTE:** POP EST, MSQ DISCOVERED 2010

Appendix A (continued).

**SANTIAM RIVER BASIN**

|           |                                  |                    |                |         |
|-----------|----------------------------------|--------------------|----------------|---------|
| Site Name | <b>STAYTON PUBLIC WORKS POND</b> | Map Code           | <b>SPWP1Q*</b> |         |
| Basin     | SANTIAM RIVER                    | Sampling Date      | 9/10/2015      |         |
| Subbasin  | NORTH SANTIAM                    | Location: Zone 10T | 516689         | 4959858 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 2100 |
| Average Depth (m)       | 1.25 |
| Maximum Depth (m)       | 2    |
| Water Temperature (C)   | 20.5 |
| Percent Silt / Organics | 80   |

|   |    |
|---|----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Submergent                                      | 5  |
| Emergent  | 20 |
| Floating  | 0  |
| Algae   | 5  |
| <i>Total</i>                                    | 30 |

**Native Fish Species Collected:**

|                         |           |
|-------------------------|-----------|
| Oregon Chub             | <b>22</b> |
| Cottids                 |           |
| Speckled Dace           |           |
| Redside Shiners         | 42        |
| Northern Pikeminnows    | 1         |
| Largescale Suckers      |           |
| Sand Rollers            |           |
| Threespine Sticklebacks |           |
| Salmonids <sup>2</sup>  |           |
| Lamprey                 |           |
| Chiselmouth             |           |

**Non-native Fish Species Collected:**

|                      |      |
|----------------------|------|
| Western Mosquitofish |      |
| Bullheads            |      |
| Common Carp          |      |
| Bluegills            | 1730 |
| Largemouth Bass      |      |
| Pumpkinseeds         |      |
| Crappies             |      |
| Smallmouth Bass      |      |
| Banded Killifish     |      |

**Other:**

**NOTE:** POP. EST.: BG ONLY

|           |                    |                    |                |         |
|-----------|--------------------|--------------------|----------------|---------|
| Site Name | <b>STOUT CREEK</b> | Map Code           | <b>STOUT1B</b> |         |
| Basin     | SANTIAM RIVER      | Sampling Date      | 5/27/2015      |         |
| Subbasin  | NORTH SANTIAM      | Location: Zone 10T | 527217         | 4958850 |

|                         |      |
|-------------------------|------|
| Surface Area (m2)       | 5300 |
| Average Depth (m)       | 1.2  |
| Maximum Depth (m)       | 1.8  |
| Water Temperature (C)   | 12   |
| Percent Silt / Organics | 20   |

|   |    |
|---|----|
| <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Submergent                                      | 20 |
| Emergent  | 20 |
| Floating  | 0  |
| Algae   | 5  |
| <i>Total</i>                                    | 45 |

**Native Fish Species Collected:**

|                                   |            |
|-----------------------------------|------------|
| Oregon Chub                       | <b>420</b> |
| Cottids                           | 345        |
| Speckled Dace                     | 24         |
| Redside Shiners                   | 1122       |
| Northern Pikeminnows              | 63         |
| Largescale Suckers                |            |
| Sand Rollers                      | 530        |
| Threespine Sticklebacks           |            |
| Salmonids <sup>2</sup> CO=3, ST=3 | 6          |
| Lamprey                           |            |
| Chiselmouth                       |            |

**Non-native Fish Species Collected:**

|                      |  |
|----------------------|--|
| Western Mosquitofish |  |
| Bullheads            |  |
| Common Carp          |  |
| Bluegills            |  |
| Largemouth Bass      |  |
| Pumpkinseeds         |  |
| Crappies             |  |
| Smallmouth Bass      |  |
| Banded Killifish     |  |

**Other:**

**NOTE:** RECENT RESTORATION, P/A CHUB ONLY

Appendix A (continued).

**SANTIAM RIVER BASIN**

|           |                                     |                    |                |         |
|-----------|-------------------------------------|--------------------|----------------|---------|
| Site Name | <b>STOUT CREEK NEAR MEAT MARKET</b> | Map Code           | <b>STOUT2A</b> |         |
| Basin     | SANTIAM RIVER                       | Sampling Date      | 5/28/2015      |         |
| Subbasin  | NORTH SANTIAM                       | Location: Zone 10T | 529995         | 4959876 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 5300 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 1    | Submergent                                      | 40 |
| Maximum Depth (m)       | 1.5  | Emergent  | 0  |
| Water Temperature (C)   | 22   | Floating  | 0  |
| Percent Silt / Organics | 80   | Algae   | 40 |
|                         |      | <i>Total</i>                                    | 80 |

**Native Fish Species Collected:**

|                           |          |
|---------------------------|----------|
| Oregon Chub               | <b>0</b> |
| Cottids                   | 5        |
| Speckled Dace             | 500      |
| Redside Shiners           |          |
| Northern Pikeminnows      |          |
| Largescale Suckers        |          |
| Sand Rollers              |          |
| Threespine Sticklebacks   |          |
| Salmonids <sup>2</sup> CO | 1        |
| Lamprey                   |          |
| Chiselmouth               |          |

**Non-native Fish Species Collected:**

|                      |  |
|----------------------|--|
| Western Mosquitofish |  |
| Bullheads            |  |
| Common Carp          |  |
| Bluegills            |  |
| Largemouth Bass      |  |
| Pumpkinseeds         |  |
| Crappies             |  |
| Smallmouth Bass      |  |
| Banded Killifish     |  |

**Other:**

**NOTE:** POND WEST OF MARKET, GOOD FOR REINTRO

|           |                        |                    |               |         |
|-----------|------------------------|--------------------|---------------|---------|
| Site Name | <b>STUDHORSE CREEK</b> | Map Code           | <b>STUD1*</b> |         |
| Basin     | SANTIAM RIVER          | Sampling Date      | 9/10/2015     |         |
| Subbasin  | SOUTH SANTIAM          | Location: Zone 10T | 509099        | 4940794 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 500  | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.3  | Submergent                                      | 5  |
| Maximum Depth (m)       | 0.4  | Emergent  | 0  |
| Water Temperature (C)   | 26.5 | Floating  | 0  |
| Percent Silt / Organics | 100  | Algae   | 20 |
|                         |      | <i>Total</i>                                    | 25 |

**Native Fish Species Collected:**

|                         |          |
|-------------------------|----------|
| Oregon Chub             | <b>0</b> |
| Cottids                 |          |
| Speckled Dace           |          |
| Redside Shiners         |          |
| Northern Pikeminnows    |          |
| Largescale Suckers      |          |
| Sand Rollers            |          |
| Threespine Sticklebacks |          |
| Salmonids <sup>2</sup>  |          |
| Lamprey                 |          |
| Chiselmouth             |          |

**Non-native Fish Species Collected:**

|                      |     |
|----------------------|-----|
| Western Mosquitofish | 20  |
| Bullheads            |     |
| Common Carp          | 1   |
| Bluegills            | 210 |
| Largemouth Bass      | 1   |
| Pumpkinseeds         |     |
| Crappies             |     |
| Smallmouth Bass      |     |
| Banded Killifish     |     |

**Other:**

**NOTE:** SOUTH SANTIAM WSC RESTORATION SITE

Appendix A (continued).

**SANTIAM RIVER BASIN**

|           |                       |                    |               |         |
|-----------|-----------------------|--------------------|---------------|---------|
| Site Name | <b>TAOLALI SLOUGH</b> | Map Code           | <b>TAOL1A</b> |         |
| Basin     | SANTIAM RIVER         | Sampling Date      | 6/25/2015     |         |
| Subbasin  | NORTH SANTIAM         | Location: Zone 10T | 521072        | 4959659 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 2000 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.3  | Submergent                                      | 40 |
| Maximum Depth (m)       | 0.75 | Emergent  | 20 |
| Water Temperature (C)   | 20   | Floating  | 5  |
| Percent Silt / Organics | 100  | Algae   | 5  |
|                         |      | <i>Total</i>                                    | 70 |

**Native Fish Species Collected:**

|                           |            |
|---------------------------|------------|
| Oregon Chub               | <b>581</b> |
| Cottids                   | 31         |
| Speckled Dace             | 48         |
| Redside Shiners           |            |
| Northern Pikeminnows      |            |
| Largescale Suckers        |            |
| Sand Rollers              |            |
| Threespine Sticklebacks   |            |
| Salmonids <sup>2</sup> CO | 1          |
| Lamprey                   |            |
| Chiselmouth               |            |

**Non-native Fish Species Collected:**

|                      |     |
|----------------------|-----|
| Western Mosquitofish |     |
| Bullheads            |     |
| Common Carp          |     |
| Bluegills            |     |
| Largemouth Bass      |     |
| Pumpkinseeds         | 142 |
| Crappies             |     |
| Smallmouth Bass      |     |
| Banded Killifish     |     |

**Other:**

**NOTE:** DRIVEWAY TO DAM, ALSO NR FOOTBRIDGE

|           |                          |                    |               |         |
|-----------|--------------------------|--------------------|---------------|---------|
| Site Name | <b>TREXLER EAST POND</b> | Map Code           | <b>TREX2B</b> |         |
| Basin     | SANTIAM RIVER            | Sampling Date      | 5/26/2015     |         |
| Subbasin  | NORTH SANTIAM            | Location: Zone 10T | 527849        | 4959214 |

|                         |      |   |    |
|-------------------------|------|---|----|
| Surface Area (m2)       | 6000 | <b>Types of aquatic vegetation <sup>1</sup></b> |    |
| Average Depth (m)       | 0.3  | Submergent                                      | 30 |
| Maximum Depth (m)       | 1    | Emergent  | 40 |
| Water Temperature (C)   | 22   | Floating  | 0  |
| Percent Silt / Organics | 100  | Algae   | 10 |
|                         |      | <i>Total</i>                                    | 80 |

**Native Fish Species Collected:**

|                           |          |
|---------------------------|----------|
| Oregon Chub               | <b>0</b> |
| Cottids                   |          |
| Speckled Dace             | 36       |
| Redside Shiners           | 19       |
| Northern Pikeminnows      |          |
| Largescale Suckers        |          |
| Sand Rollers              |          |
| Threespine Sticklebacks   |          |
| Salmonids <sup>2</sup> CO | 1        |
| Lamprey                   |          |
| Chiselmouth               |          |

**Non-native Fish Species Collected:**

|                      |  |
|----------------------|--|
| Western Mosquitofish |  |
| Bullheads            |  |
| Common Carp          |  |
| Bluegills            |  |
| Largemouth Bass      |  |
| Pumpkinseeds         |  |
| Crappies             |  |
| Smallmouth Bass      |  |
| Banded Killifish     |  |

**Other:**

**NOTE:** BETWEEN FERRY AND RIVERHAVEN ROAD

Appendix A (continued).

**SANTIAM RIVER BASIN**

|           |                          |                    |               |         |
|-----------|--------------------------|--------------------|---------------|---------|
| Site Name | <b>TREXLER WEST POND</b> | Map Code           | <b>TREX1B</b> |         |
| Basin     | SANTIAM RIVER            | Sampling Date      | 5/26/2015     |         |
| Subbasin  | NORTH SANTIAM            | Location: Zone 10T | 527849        | 4959214 |

|                         |      |   |     |
|-------------------------|------|---|-----|
| Surface Area (m2)       | 2250 | <b>Types of aquatic vegetation <sup>1</sup></b> |     |
| Average Depth (m)       | 1    | Submergent                                      | 30  |
| Maximum Depth (m)       | 1.5  | Emergent  | 10  |
| Water Temperature (C)   | 15   | Floating  | 40  |
| Percent Silt / Organics | 60   | Algae   | 20  |
|                         |      | <i>Total</i>                                    | 100 |

**Native Fish Species Collected:**

|                         |    |
|-------------------------|----|
| Oregon Chub             | 4  |
| Cottids                 | 2  |
| Speckled Dace           | 5  |
| Redside Shiners         | 43 |
| Northern Pikeminnows    |    |
| Largescale Suckers      |    |
| Sand Rollers            |    |
| Threespine Sticklebacks |    |
| Salmonids <sup>2</sup>  |    |
| Lamprey                 |    |
| Chiselmouth             |    |

**Non-native Fish Species Collected:**

|                      |
|----------------------|
| Western Mosquitofish |
| Bullheads            |
| Common Carp          |
| Bluegills            |
| Largemouth Bass      |
| Pumpkinseeds         |
| Crappies             |
| Smallmouth Bass      |
| Banded Killifish     |

**Other:**

**NOTE:** ANOXIC CONDITIONS, BEHIND TREXLER FARMS





4034 Fairview Industrial Drive SE

Salem, Oregon 97302