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Properties that Support Populations of the Endangered Oregon Chub

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## **Management Plan for Oregon Department of Transportation Properties That Support Populations of the Endangered Oregon Chub**

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Oregon chub *Oregonichthys crameri* (Snyder 1908) are small floodplain minnows endemic to the Willamette Valley of western Oregon (Markle et al. 1991). Oregon chub prefer off-channel habitats with minimal or no flow, an abundance of vegetation, and depositional substrate (Pearsons 1989; Scheerer 2002). Suitable habitats include side-channels, sloughs, oxbows, beaver ponds, and permanent wetlands. Historically, this species was widely distributed throughout the Willamette Valley (Snyder 1908; Markle et al. 1991). The loss of suitable habitats and their restricted range led to their listing as endangered under the Endangered Species Act in 1993 (U.S. Fish and Wildlife Service 1993).

The purpose of this document is to develop management plans for Oregon chub populations on Oregon Department of Transportation (ODOT) lands: East Fork Minnow Creek (Middle Fork Willamette River), Coast Fork Willamette River Side Channels near Creswell (Coast Fork Willamette River), and Santiam I-5 Backwaters (Santiam River). The plans include recommendations for habitat protection, habitat improvement, and monitoring of population abundance and habitat condition at these locations. The plans represent continuing collaboration on Oregon chub conservation efforts between the U.S. Fish and Wildlife Service (USFWS), ODOT, and the Oregon Department of Fish and Wildlife (ODFW). These plans will help USFWS meet Oregon chub recovery goals by effectively managing the sites. Quantitative estimates of Oregon chub abundance are necessary to determine the status of populations, to monitor changes in population size, to provide valuable information on the stability of these populations over time, and to evaluate the effectiveness of conservation strategies. Two of these properties, East Fork Minnow Creek Pond and Santiam I-5 Backwaters are proposed for inclusion in a conservation bank under a proposed conservation banking agreement between ODOT, USFWS, ODFW,

Federal Highway Administration, Oregon Department of State Lands, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, and NOAA Fisheries.

## **Site Descriptions**

### East Fork Minnow Creek Pond-

East Fork Minnow Creek Pond is a large beaver pond located on a small tributary to Minnow Creek that drains into Lookout Point Reservoir (RK 336) in the Middle Fork Willamette River drainage (T19S-R1E-S30NE) (Appendix A). East Fork Minnow Creek enters Minnow Creek approximately 50 meters south of Highway 58. Minnow Creek flows under Highway 58 through a 3 meter by 2.4 meter concrete box culvert. ODOT owns approximately 4 hectares of property including East Fork Minnow Creek Pond and the lower ~150 meters of Minnow Creek. East Fork Minnow Creek Pond is an active beaver pond that has been in existence for over 20 years. The pond has experienced considerable sedimentation since 1996. Total wetted area is approximately 5000 m<sup>2</sup> (0.5 hectares) and the beaver dam is approximately 100 meters wide.

East Fork Minnow Creek Pond is densely vegetated, dominated by cattails, willows, and burr reed. Also present are bullrush, water velvet, duckweed, yellow iris, spike rush, juncas rush, and reed canary grass. The substrate is silt and organics. The riparian zone is a mix of douglas fir, western red cedar, red alder, and willow. Fish species present in the pond include Oregon chub, speckled dace, and redbreast shiners. Amphibians observed or captured in the pond include red-legged frogs, roughskinned newts, and northwestern salamanders. Crayfish are occasionally captured.

In 1992, ODFW first discovered the population of Oregon chub in East Fork Minnow Creek Pond. Population estimates have been obtained annually since 1993. Abundance estimates ranged from a high of 8,770 in 1993 to a low of 3,140 in 2004 (Table 1) (Scheerer et al. 2004). Abundance declined

Table 1. Estimates of the population abundance of Oregon chub on ODOT properties in the Willamette Valley, Oregon.

Location	Date	Estimate	95% Confidence Intervals	
			lower	upper
<b>Santiam River Drainage</b>				
Santiam I-5 Ponds	2002	350	260	520
	2003	220	130	630
	2004	320	240	500
<b>Middle Fork Willamette River Drainage</b>				
E. Fk. Minnow Creek Pond	1993	8,770	8,280	9,330
	1994	7,540	6,440	8,640
	1995	7,130	6,300	8,100
	1996	4,540	4,040	5,180
	1997	4,020	3,420	4,870
	1998	4,440	3,940	5,100
	1999	4,780	4,100	5,720
	2000	5,050	4,130	6,490
	2001	3,380	2,930	3,980
	2002	3,270	2,840	3,860
	2003	3,650	3,140	4,350
	2004	3,140	2,700	3,660
<b>Coast Fork Willamette River Drainage</b>				
Coast Fork Side Channels	2003	130	90	230
	2004	190	110	600

substantially following the 1996 floods. Suitable habitat was reduced by nearly 50 percent, due to accelerated sedimentation (runoff from clear cuts). Pond surface area was reduced from approximately 9,500 m<sup>2</sup> to approximately 5,000 m<sup>2</sup>.

#### Santiam I-5 Side Channel Ponds-

The Santiam Side Channel Ponds are located on a 27 hectare property on the south side of the Santiam River (RK 10-11) upstream of the Interstate Highway I-5 bridge crossing (T10S-R3W-S3NW) (Appendix A). The site has four distinct habitats, three of which contain Oregon chub. The chub sites include a small backwater pool (~930 m<sup>2</sup>), a gravel pit (~7,430 m<sup>2</sup>), and a side channel pond (~6,000 m<sup>2</sup>).

The backwater pool is densely vegetated. Aquatic plants include burr reed, elodea, pondweed, smartweed, spike rush, and reed canary grass. The substrate is silt and organics. The riparian zone is a mix of cottonwoods, alders, willows, and a few conifers. Native fish species present in the backwater include Oregon chub, prickly sculpins, speckled dace, redbottom shiners, northern pikeminnows, largescale suckers, threespine sticklebacks, chiselmouth, and sandrollers. Nonnative fish include bluegills and largemouth bass. Amphibians observed or captured include bullfrogs and roughskinned newts.

The side channel pond is densely vegetated. Aquatic plants include burr reed, smartweed, spike rush, willow, and reed canary grass. The riparian zone is a mix of cottonwood, alder, and willow. Native fish species present in the pond include Oregon chub, sculpins, speckled dace, redbottom shiners, northern pikeminnows, largescale suckers, chiselmouth, sandrollers, and threespine sticklebacks. Nonnative fish include bluegill and largemouth bass. Amphibians observed or collected include bullfrogs and roughskinned newts.

The gravel pit is deep (mostly >2 meters) with steep side slopes and dense vegetation. Aquatic vegetation is dominated by invasive, non-native parrot feather (milfoil), with smaller amounts of false loosestrife, reed canary grass, and water starwort. Native fish present in the pond include redbottom shiners, threespine sticklebacks, prickly sculpins, and northern pikeminnow. Non-native

fish include western mosquitofish, pumpkinseeds, and largemouth bass. Amphibians observed or collected include bullfrogs, northwestern salamanders, and roughskinned newts.

Two small ponds are part of a slough located east (upstream) of the backwater pool. Oregon chub were not collected in the slough. The northerly pond is ~270 m<sup>2</sup> and averages 0.8 meters deep. This pond is densely vegetated with smartweed, spike sedge, reed canary grass, willow, and carex sedge. Only native fish were collected from this pond (speckled dace, threespine sticklebacks, largescale suckers, redbase shiners, chiselmouth, prickly sculpins, sandrollers, and northern pikeminnows). The southerly pond is ~850 m<sup>2</sup> and averages 0.5 meters deep. The pond is densely vegetated with smartweed, reed canary grass, yellow iris, pondweed, spike sedge, and water milfoil. Only native fish were collected from this pond (redside shiners, speckled dace, prickly sculpins, threespine sticklebacks, largescale suckers, and northern pikeminnows). Bullfrogs were also present in the slough. During winter high flow events, this slough drains into the backwater pool.

Oregon chub were first discovered at the Santiam I-5 site in 1997. Only small numbers were collected from the side channel pond and backwater pool in 1997-2001 (n<14). In the last 3 years, the population abundance in the side channel pond has increased. Abundance estimates were obtained in 2002 (n=350), 2003 (n=220), and 2004 (n=320) (Table 1). One Oregon chub was collected from the gravel pit in 2004.

#### Coast Fork Willamette River Side Channels-

The Coast Fork Willamette River Side Channels (RK 26) are located on a 0.6 hectare ODOT right-of-way (T19S-R3W-S35W) on the west side of the Interstate Highway I-5 bridge crossing (MP 179.9) over the Coast Fork Willamette River, approximately 13 kilometers north of Cottage Grove, Oregon (Appendix A).

The site consists of a series of side channels and off-channel ponds on and adjacent to a small island in the Coast Fork Willamette River. The site has a

wetted surface area of ~2,400 m<sup>2</sup>. The water bodies are sparsely vegetated with a mix of water milfoil, elodea, pondweed, reed canary grass, and willow. The substrate is a mix of silt/organics, gravel, and cobble. The riparian zone is a mix of hardwoods (cottonwood, willow, and alder). Native fish species present at the site include Oregon chub, speckled dace, redbreast shiners, northern pikeminnows, largescale suckers, threespine sticklebacks, and sculpins. Nonnative fish include bluegills and pumpkinseeds. Amphibians observed or collected include bullfrogs and roughskinned newts. Oregon chub were first discovered in 2002. Population estimates were obtained in 2003 (n=130) and 2004 (n=190) (Table 1).

### **Population Monitoring**

The Oregon Chub Recovery Plan (U.S. Fish and Wildlife Service 1998) set recovery goals for downlisting the species to “threatened” and for delisting the species. The criteria for downlisting the species is to establish and manage ten populations of at least 500 adult fish. All populations must exhibit a stable or increasing trend for five years. At least three populations must be located in each of the three sub-basins (Middle Fork Willamette River, Santiam River, mainstem Willamette River and tributaries). In 2004, there were 12 populations totaling 500 or more individuals that exhibited a stable or increasing trend for five years. Eight populations were located in the Middle Fork Willamette drainage, two populations were located in the mainstem Willamette drainage, and two populations were located in the Santiam drainage. The East Fork Minnow Creek Pond population is the only location on ODOT property with five or more years of abundance data. This population does not meet the above criteria because of a declining abundance trend over the past five years (Table 1) (Scheerer et al. 2004).

To monitor the status of Oregon chub populations, and to track progress being made towards recovery goals (and possible downlisting to threatened status), ODFW has been obtaining annual population abundance estimates using mark-recapture protocols (Scheerer et al. 2004). Sometimes population

estimates are not obtained when catch rates are very low (<20 fish). Ideally, population abundance estimates will be conducted annually at all of the ODOT sites listed in the previous section. The estimated costs of ODFW monitoring of population abundance and habitat condition is \$1,400 per population per year.

### **Habitat Condition, Protection, and Enhancement**

The condition the Oregon chub habitat at ODOT sites is discussed below. The long-term persistence of the Oregon chub populations at these locations is dependent on the long-term protection and/or enhancement of the Oregon chub habitat.

#### East Fork Minnow Creek Pond

The biggest threat to the Oregon chub population in East Fork Minnow Creek Pond is sedimentation. Since we first visited the site in 1992, the site has experienced an approximate 50 percent reduction in wetted surface area (~4,500 m<sup>2</sup> reduction), and water depth has been reduced in areas immediately behind the large beaver dam. A small amount of additional habitat has been created by beavers between the large dam and Minnow Creek (~100 m<sup>2</sup>). Loss of beavers through trapping would also be particularly harmful to this population. Restricting access and/or banning trapping are advised. Future sedimentation is likely to continue, considering the amount of timber harvest in the watershed in the past 10 years. The beaver have been able to elevate the dam to offset some of the sedimentation. Future efforts to excavate open water habitats may be required to maintain this population. A continued loss of habitat with a subsequent further decline in the population abundance may trigger this action. Mapping of the site to monitor changes in habitat quality over time is advised. Initial mapping was conducted in September 2004 by a private consulting firm.

In December 2001, the culvert under Highway 58 was nearly blocked by a beaver dam (approximately 2 meters high by 3 meters wide) that was impounding water over 100 meters in Minnow Creek. ODOT was concerned

about possible road failure, wanted to remove the dam, and called a meeting on site to determine the course of action. After sampling the new beaver pond and collecting no Oregon chub, ODFW, USFWS, and ODOT determined that there would be no affects to the Oregon chub population by removing the dam. The dam was subsequently removed. A similar problem may occur in the future. Frequent visits to the site by ODOT maintenance personnel should occur during the rainy season to remove dams as they are first being formed, thus preventing the construction of large dams like the one that was built in 2001.

ODOT's tasks at East Fork Minnow Creek Pond, listed in the implementation schedule of the Oregon Chub Recovery Plan (U.S. Fish and Wildlife Service 1998), include pursuing herbicide/pesticide spray restrictions on property adjacent to the pond (1.12.2), constructing a barrier between the habitat and the highway (1.12.3), and protecting the beaver dam that controls the pond water levels (1.12.5). A "no spray" agreement with ODOT to prohibit application of herbicides adjacent to Highway 58 was completed in 1996. Constructing a barrier between the highway and the pond consists of constructing a curb to prevent accidental highway spills from reaching the pond. There have been several truck accidents that resulted in spills on the highway between Lowell and Oakridge, one involving release of methanol. It is uncertain whether a spill would reach the pond because of the substantial riparian buffer between the highway and the pond. The last task listed, protection of the beaver dam, could be best achieved by posting the site to prohibit trapping. An alternative would be to restrict access by posting "no trespassing" signs.

#### Santiam I-5 Side Channel Ponds

The largest threat to Oregon chub at the Santiam I-5 sites is the presence of nonnative fishes. Centrarchids are commonly collected at these locations and may be limiting the abundance of Oregon chub. Nonnative fish are common in the Santiam River drainage (44% of the 117 locations ODFW sampled between 1992 and 2004). Removal of nonnative fish is not generally feasible and the risk or re-invasion is high because these sites are within the active floodplain of the

Santiam River. Monitoring the abundance of Oregon chub and the relative abundance of centrarchids in the side channel pond is advised. If chub abundance drops and/or centrarchid abundance increases then a salvage operation may be needed.

Creating or enhancing habitat adjacent to the existing side channel pond has been identified as a key recovery task at the Santiam I-5 site (implementation task 1.4.2). In 2004, we found the ponds comprising the eastern slough to be suitable chub habitat and to contain only native fish (no chub). ODFW and USFWS will consider a transfer of fish into this habitat to reduce the risk of extinction of this population. This would also increase the probability of achieving a large (>500 fish) stable population that meets the Recovery Plan criteria. Maintaining and/or expanding the riparian buffer zones around the I-5 sites (implementation task 1.4.1) are probably not needed. The riparian zone appears to be healthy and functioning.

#### Coast Fork Side Channels

The largest threat to Oregon chub in the Coast Fork Side Channels is the presence of nonnative fishes. Centrarchids were found to be widespread during sampling conducted in 2002-2004 and may be limiting the abundance of Oregon chub at this location. Nonnative fish are common in the Coast Fork Willamette subbasin (55% of the 82 locations ODFW sampled between 1992 and 2004). Removal of nonnative fishes, particularly from a site that is not isolated from the river, is impractical. Creation of an isolated pond is also not possible at this location. Monitoring the population over time to determine status and trends is advised. If the population abundance is sufficiently large, using a portion (maximum 10% removal per year) of this population to start a new population at a secure location within the drainage could result in longer term persistence of this population. Currently, the relatively low population abundance (n=190) would require introductions of a small number of individuals over numerous subsequent years to achieve the minimum target of 500 total fish transferred.

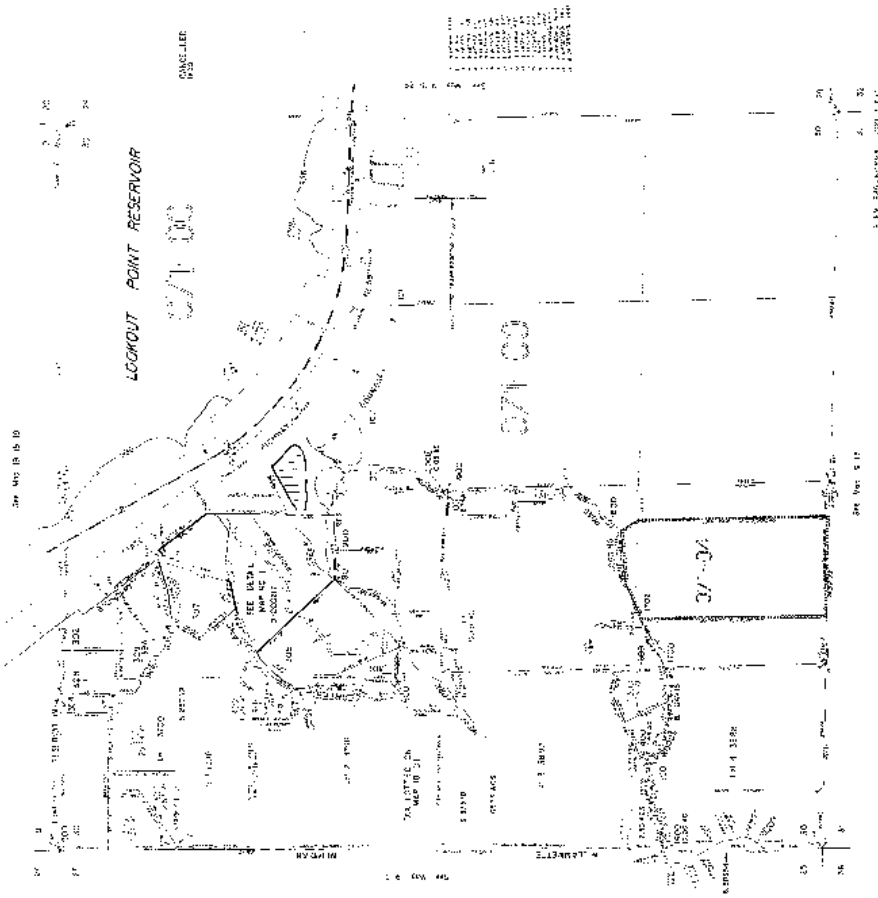
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Appendix A. USGS topographic maps, plat maps, and aerial photographs for East Fork Minnow Creek Pond, Santiam I-5 Side Channel Ponds, and Coast Fork Side Channels.

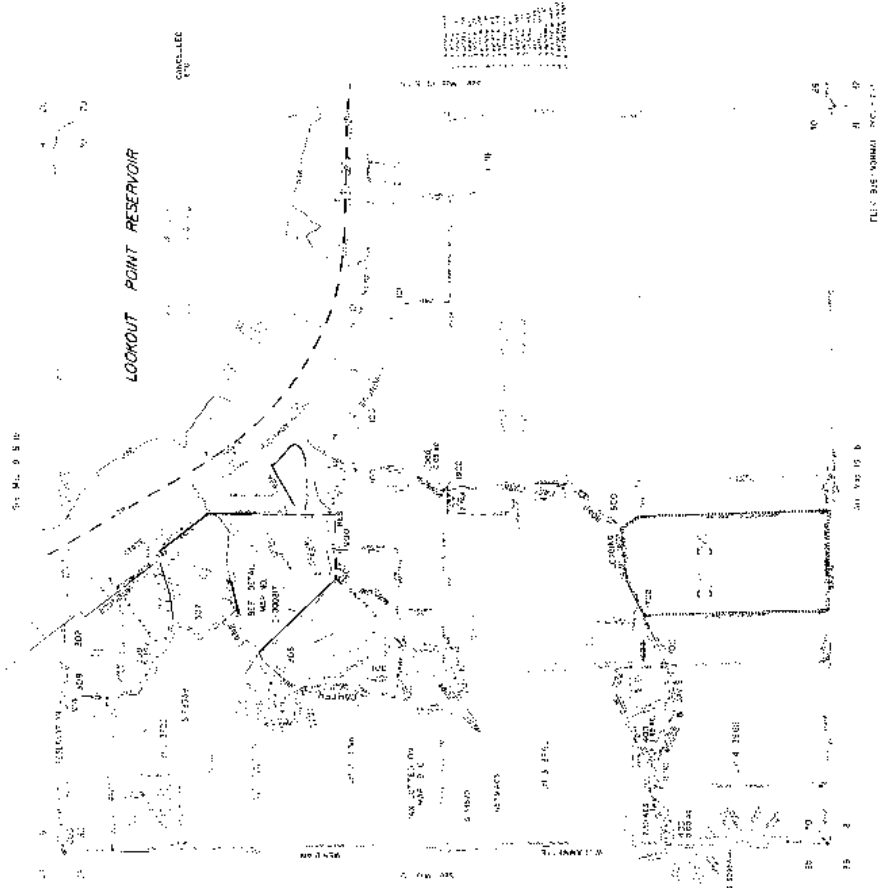
19 15 30

Section 30 T 19 S R 1 E W.M.  
LANE COUNTY



29 15 30

Section 30 T19S R1E.W.M.  
LANE COUNTY



USGS 1 km SE of Minnow, Oregon, United States 29 Jun 1994

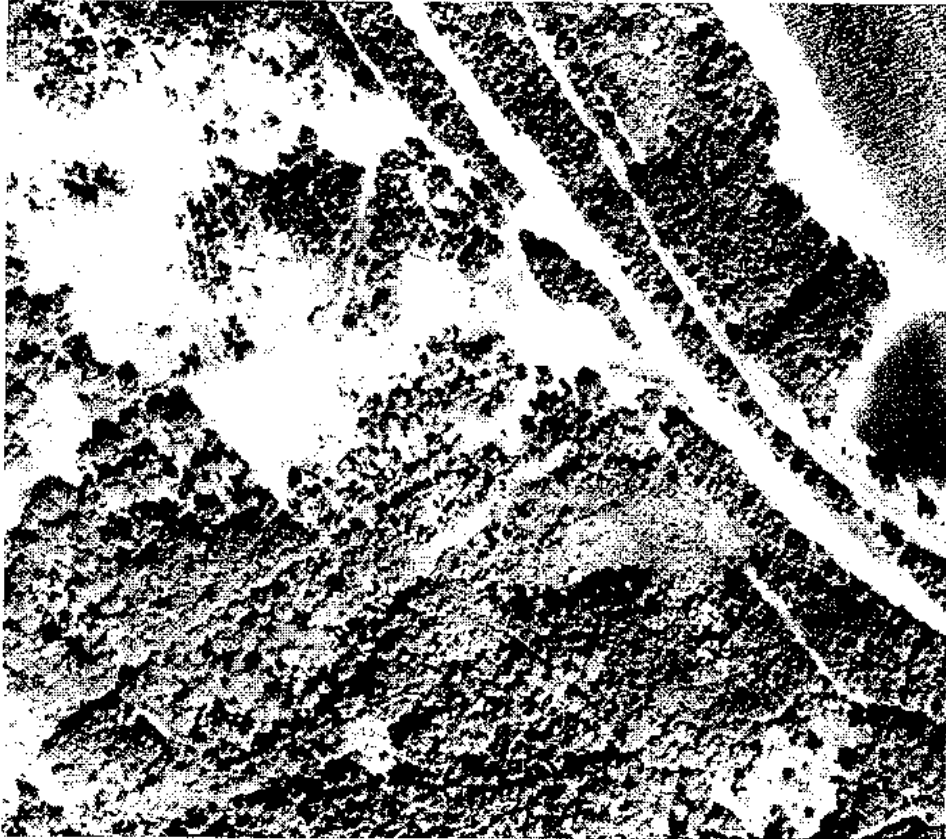
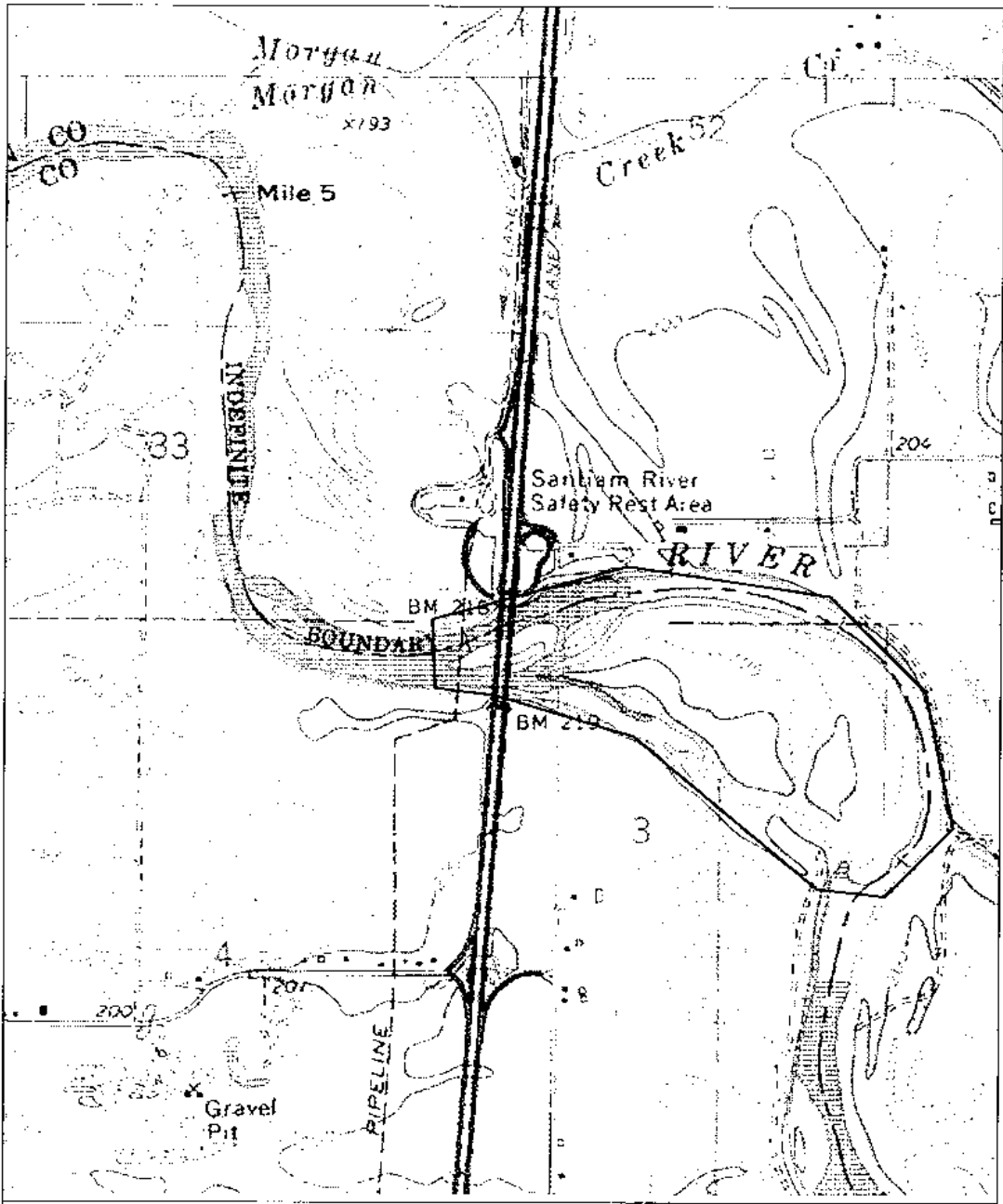


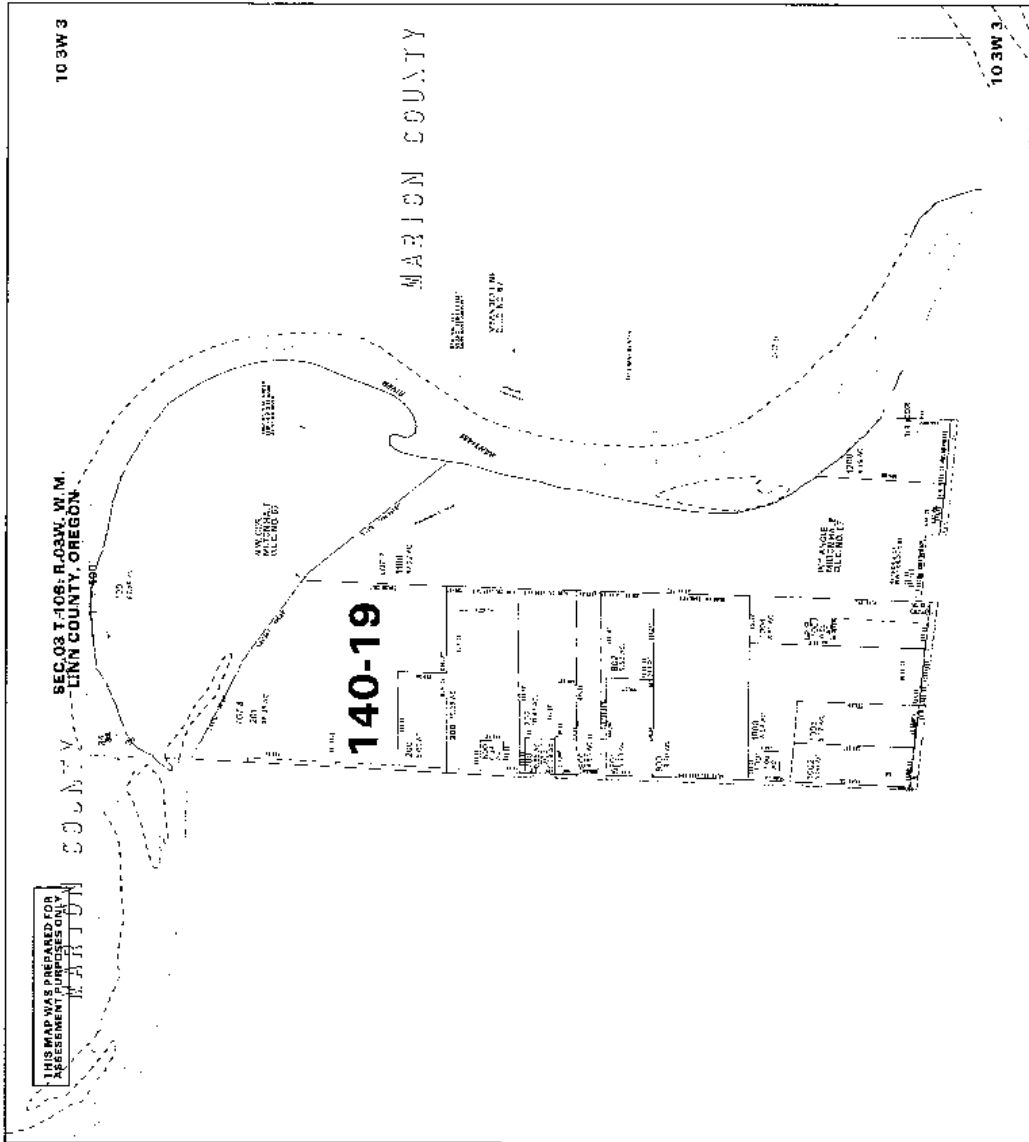
image courtesy of the U.S. Geological Survey



Name: ALBANY  
 Date: 3/9/2004  
 Scale: 1 inch equals 1000 feet

Location: 044° 44' 17.9" N 123° 03' 05.2" W  
 Caption: Santiam I-5 Backwater and Pond

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USGS 12 km N of Albany, Oregon, United States 23 May 1994

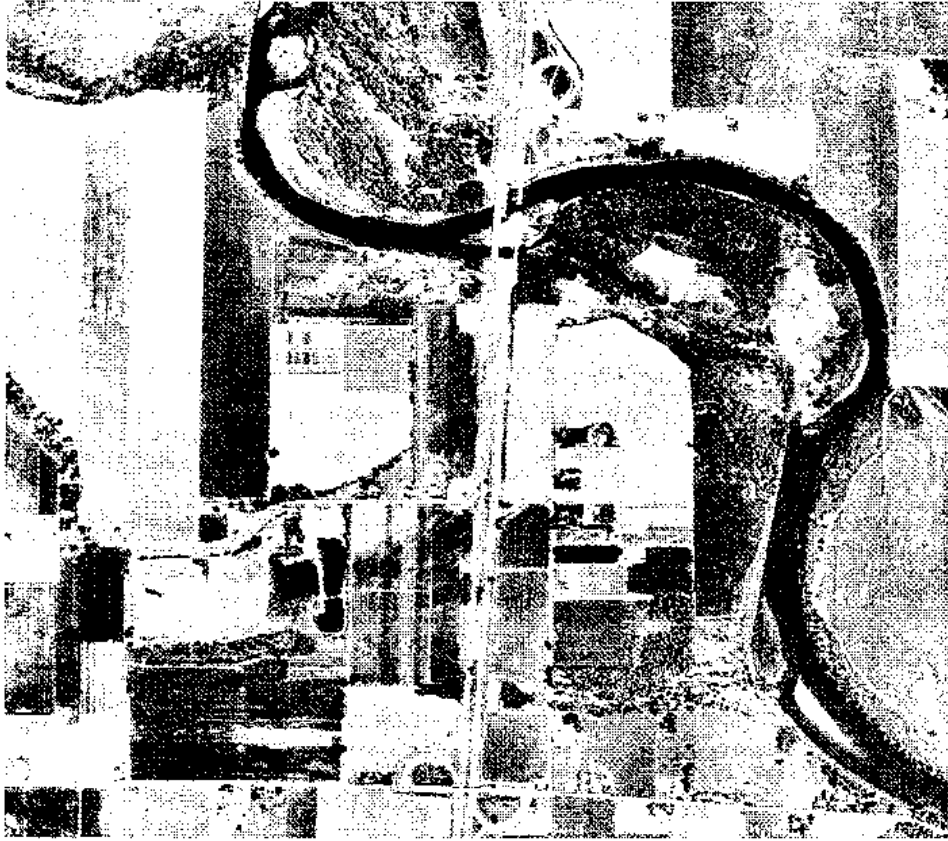
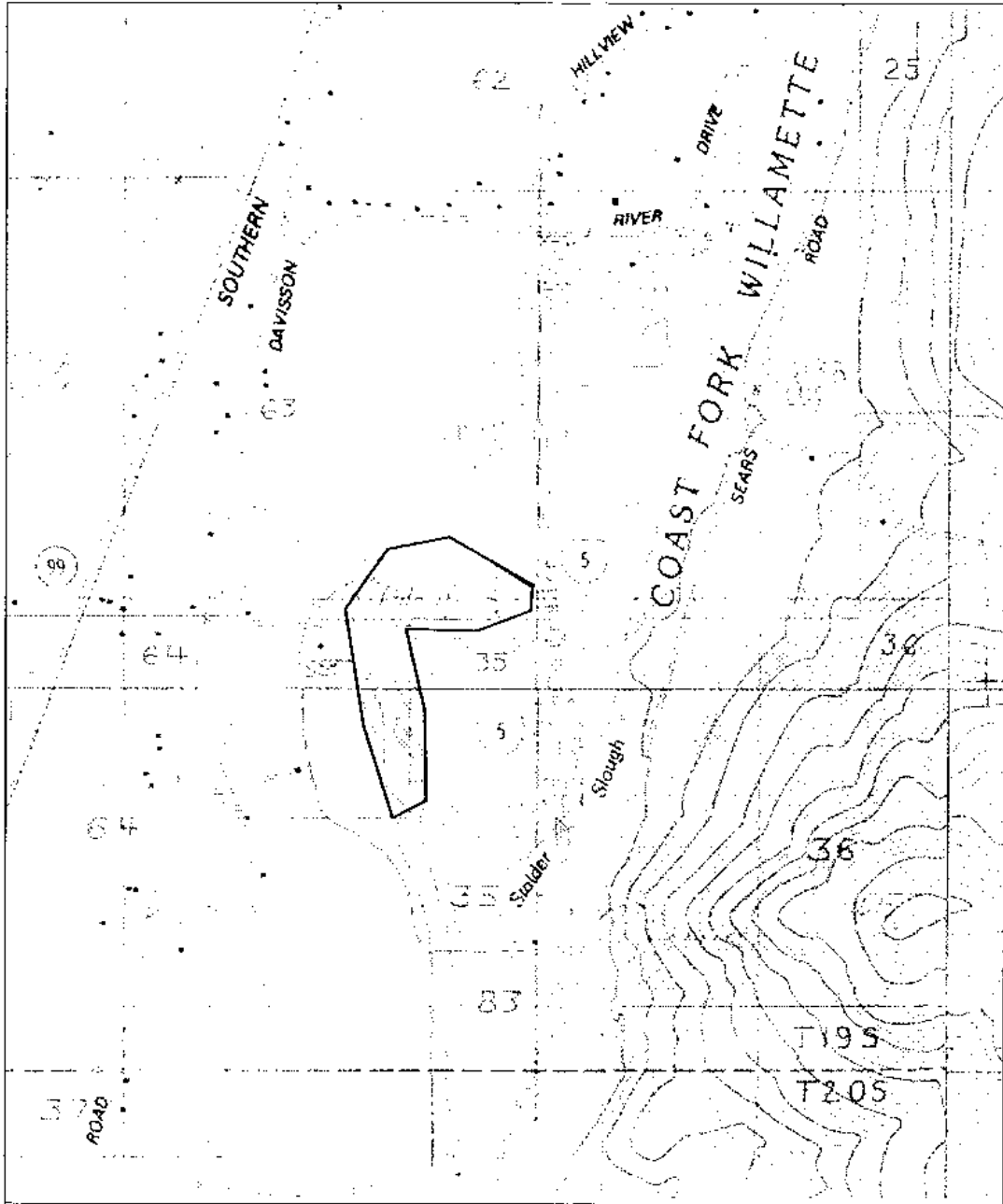


Image courtesy of the U.S. Geological Survey



Name: CRESWELL  
 Date: 3/9/2004  
 Scale: 1 inch equals 1000 feet

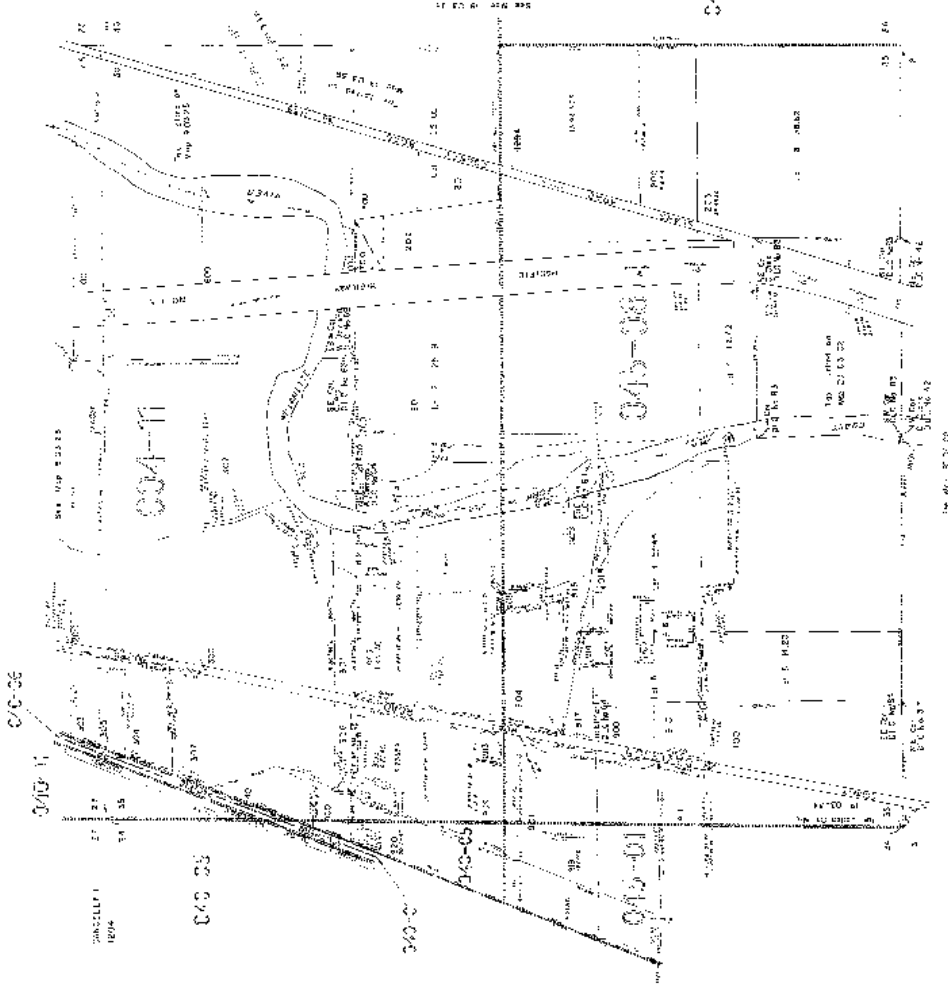
Location: 043° 52' 36.6" N 123° 00' 48.0" W  
 Caption: Coast Fork Willamette Side Channels

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19 03 35

Section 35 T. 9S. R. 3W. W.M.  
LANE COUNTY

14-000



04-09

USGS 20 km S of Eugene, Oregon, United States 19 Jun 1964



200M

Image courtesy of the U.S. Geological Survey