

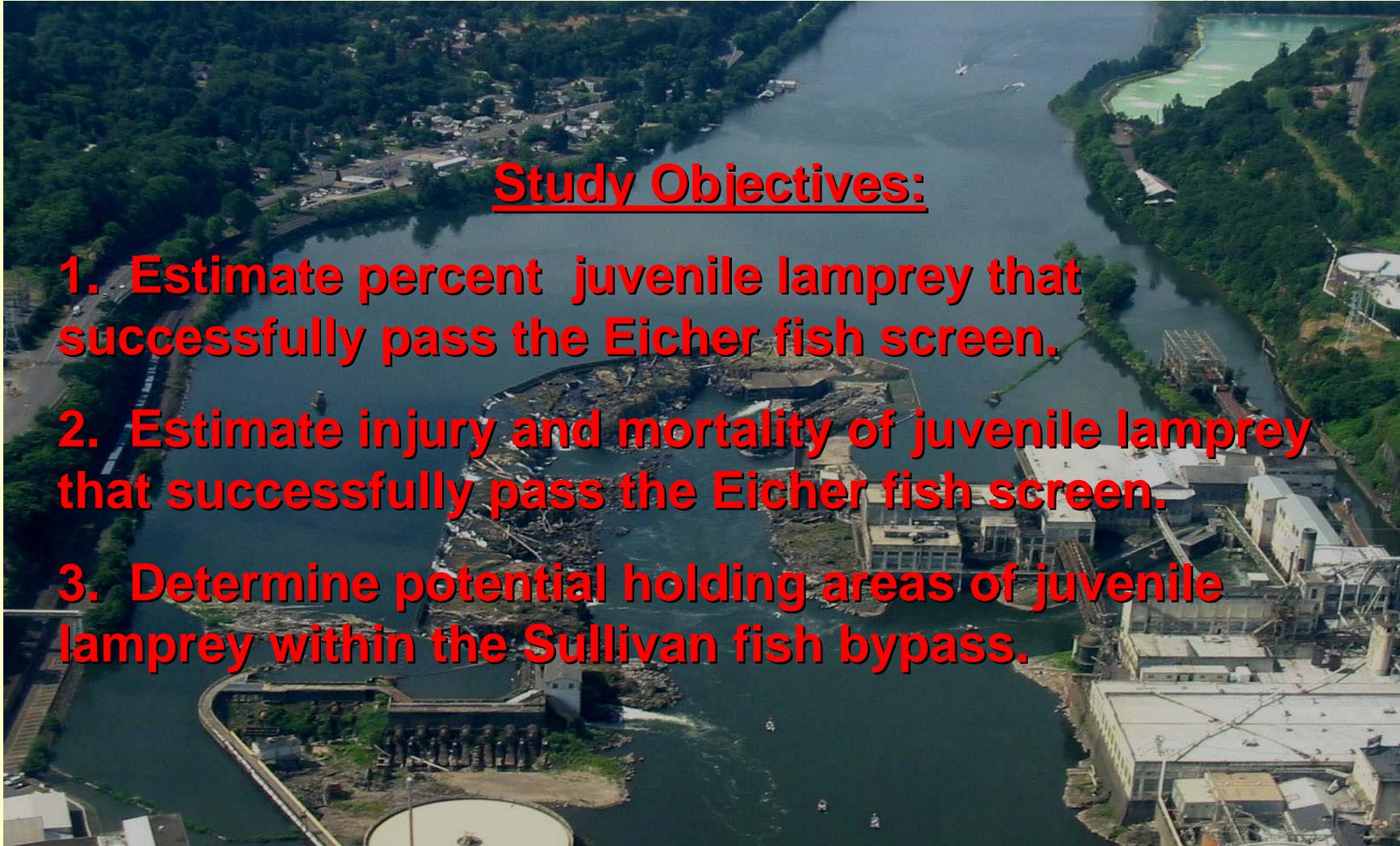
Assessment of the Eicher screen and fish bypass on migrating juvenile Pacific lamprey at the Sullivan Plant, Willamette Falls, Oregon



# Assessment of the Eicher screen and fish bypass on migrating juvenile Pacific lamprey at the Sullivan Plant, Willamette Falls, Oregon.

## Study Objectives:

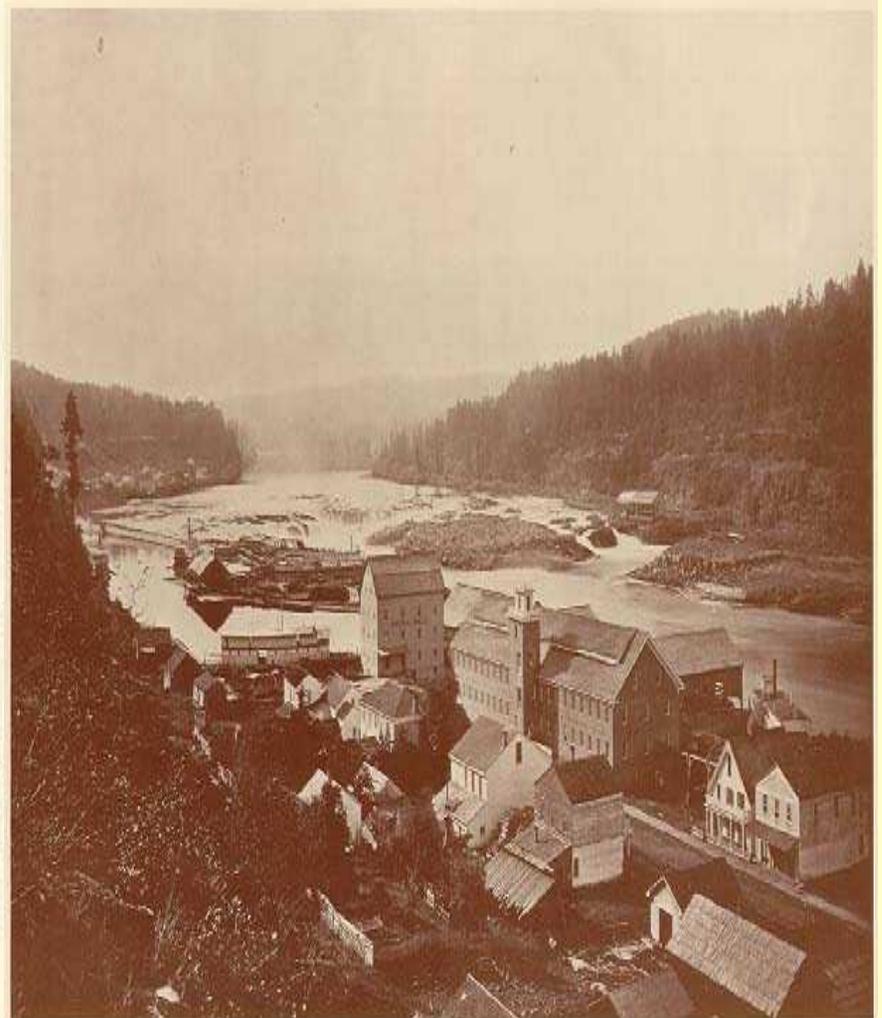
1. Estimate percent juvenile lamprey that successfully pass the Eicher fish screen.
2. Estimate injury and mortality of juvenile lamprey that successfully pass the Eicher fish screen.
3. Determine potential holding areas of juvenile lamprey within the Sullivan fish bypass.



# Willamette Falls, ~1870's



Figure 6.- Willamette Falls from west bank, about 1870, prior to construction of navigation lock and industrial development on west bank of river. Cal-de-sac in near distance on right, with two channels over falls spilling into it. Moores Island on left of these channels. Main falls on left and extending into center distance.



Clarence W. Watkins Photo  
Oregon Historical Society Picture

1867

WILLAMETTE FALLS, BOAT BASIN AND THE FIRST OREGON CITY MFG. CO. (WOOLEN MILL) BUILDING

# Willamette Falls Locks (1874). Falls Before New Fish Ladder (1960's)

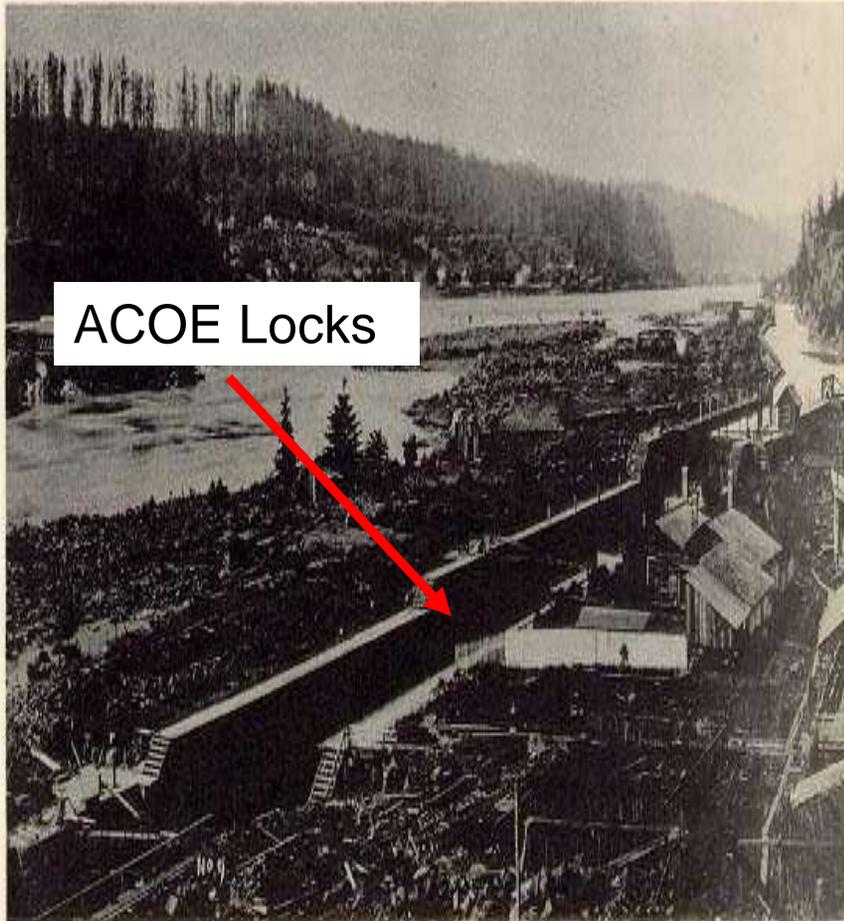


Figure 8.- Willamette Falls from west bank, about 1880. Navigation canal on right; main falls in distance.

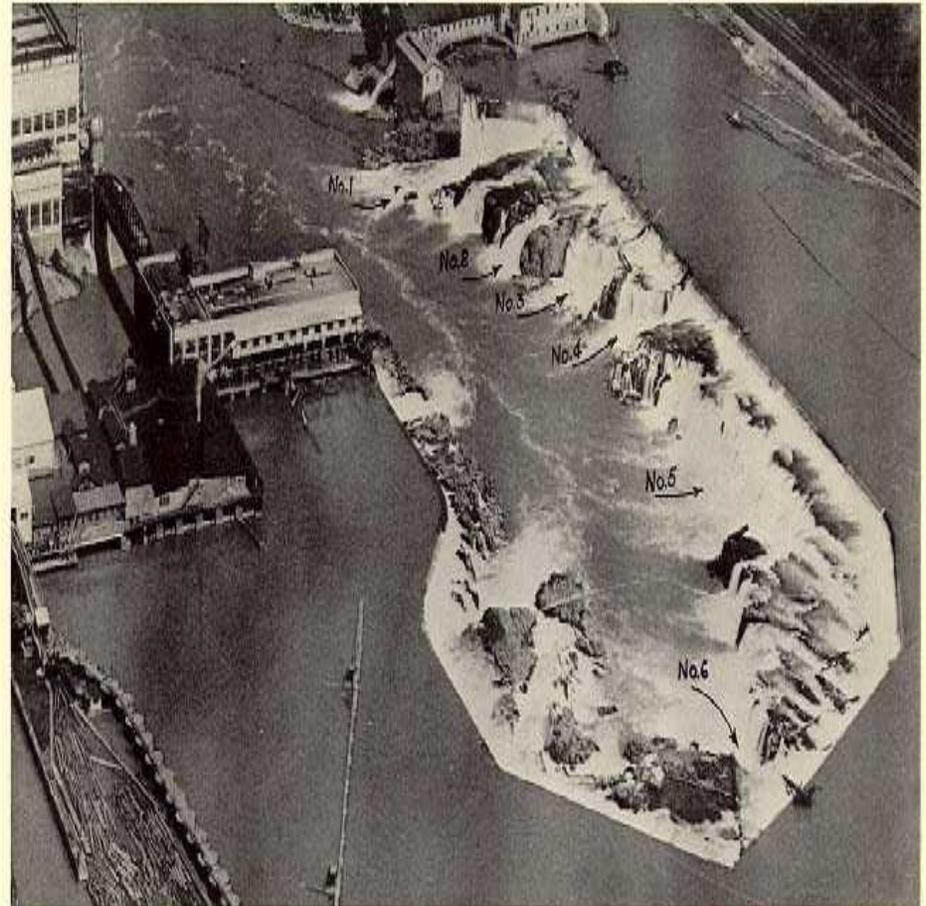


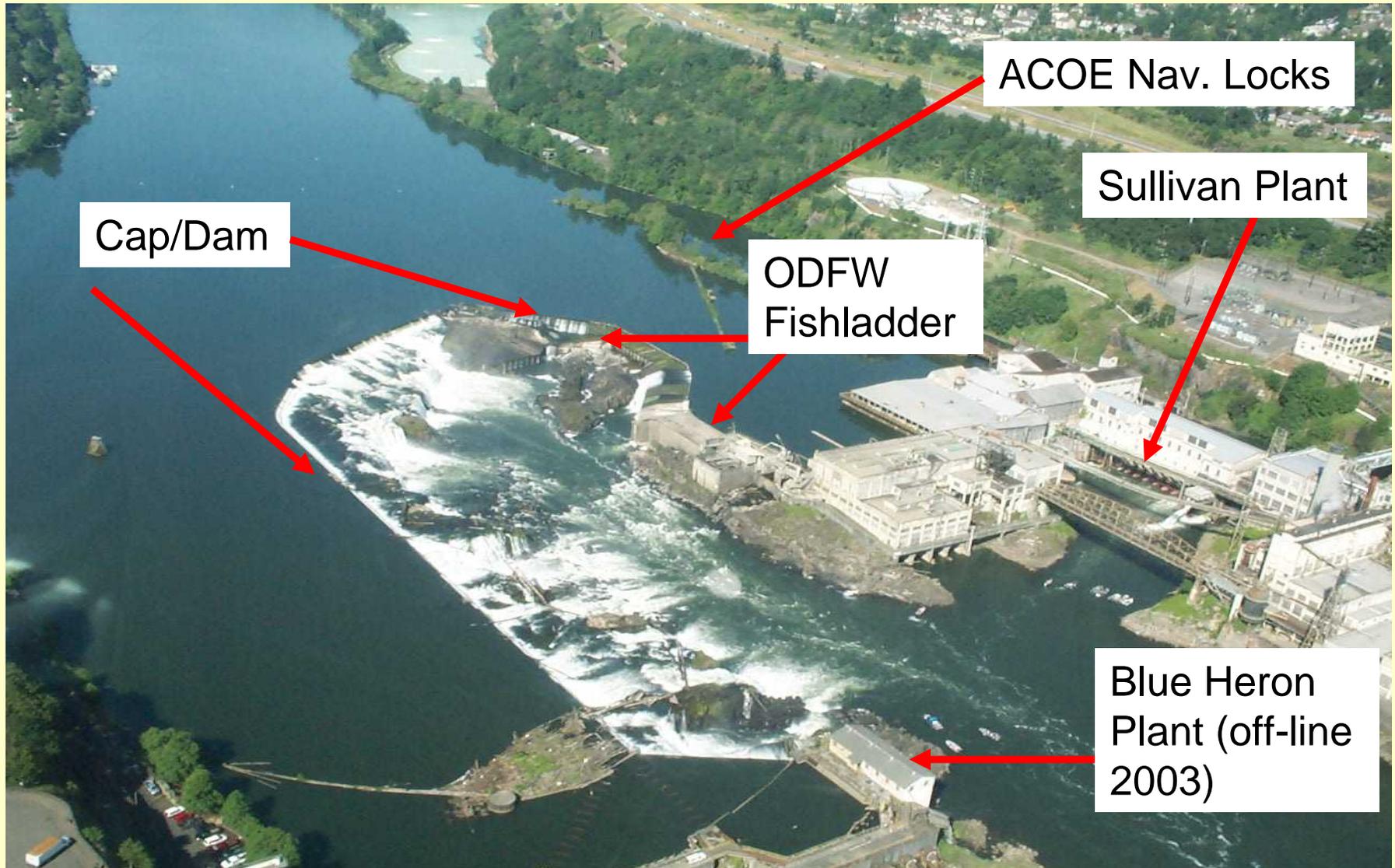
Figure 95.- Areas below Willamette Falls selected for special attention in observation of fish activity, 7/3/53. TW-52.6; TW-14.9

# Sullivan Hydro Plant Built 1895. FERC No. 2233; License Expires 2004



Figure 7.- Willamette Falls from west bank, about 1885. Navigation canal on right; Cul-de-sac in foreground; main falls in left center distance.

# Willamette Falls Project; Sullivan Plant, Blue Heron Plant & ODFW Fish Ladder



Cap/Dam

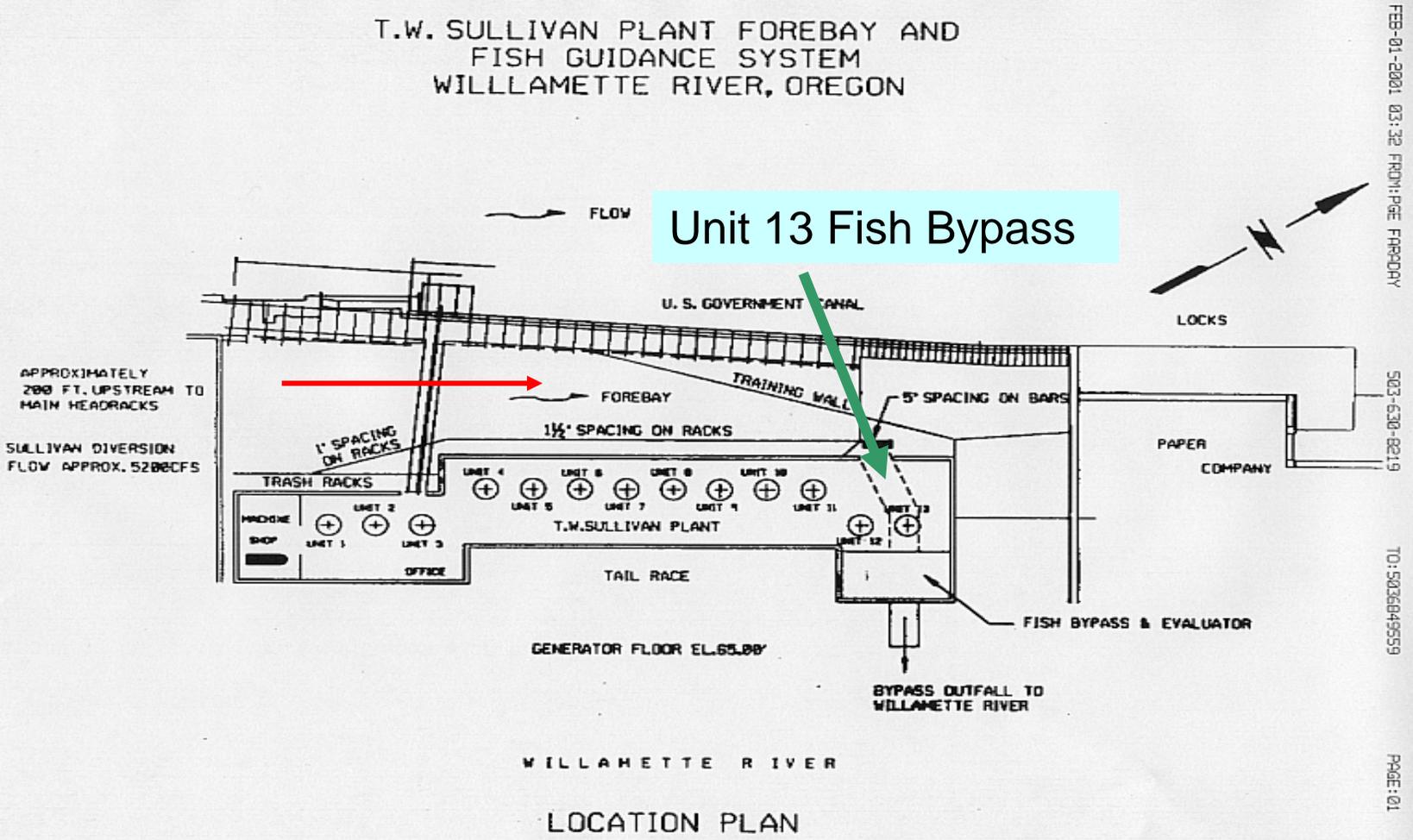
ACOE Nav. Locks

Sullivan Plant

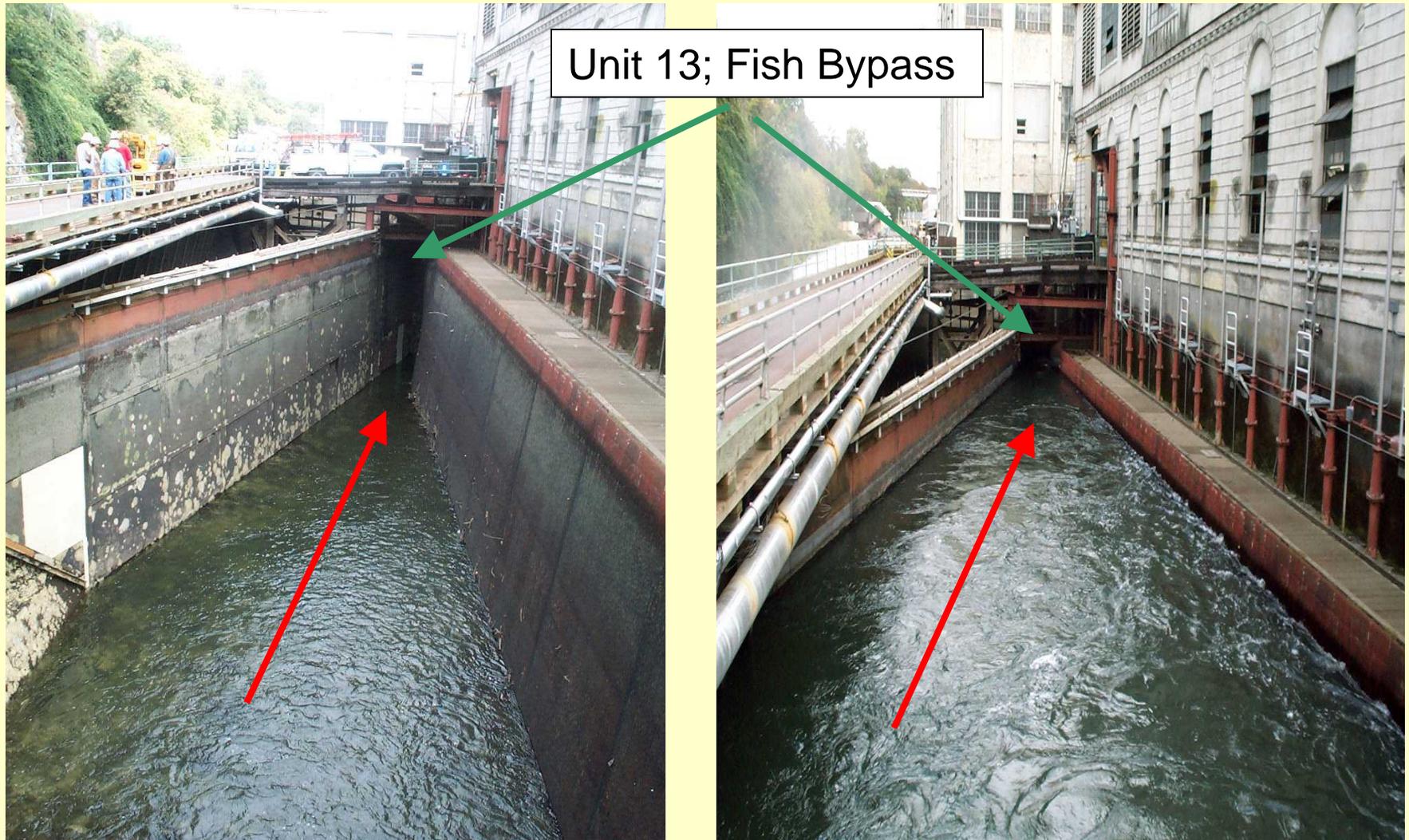
ODFW  
Fishladder

Blue Heron  
Plant (off-line  
2003)

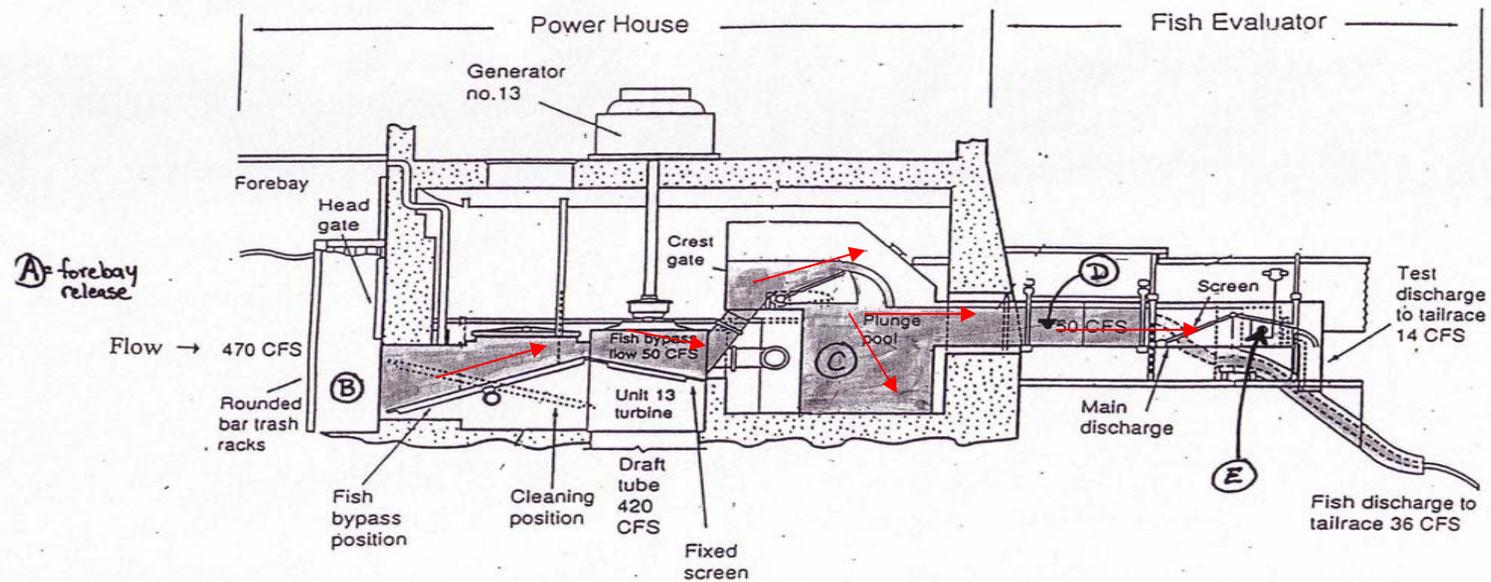
# T.W. Sullivan Hydroelectric Plant forebay and fish guidance system.



# Sullivan forebay and fish guidance system dewatered and full.

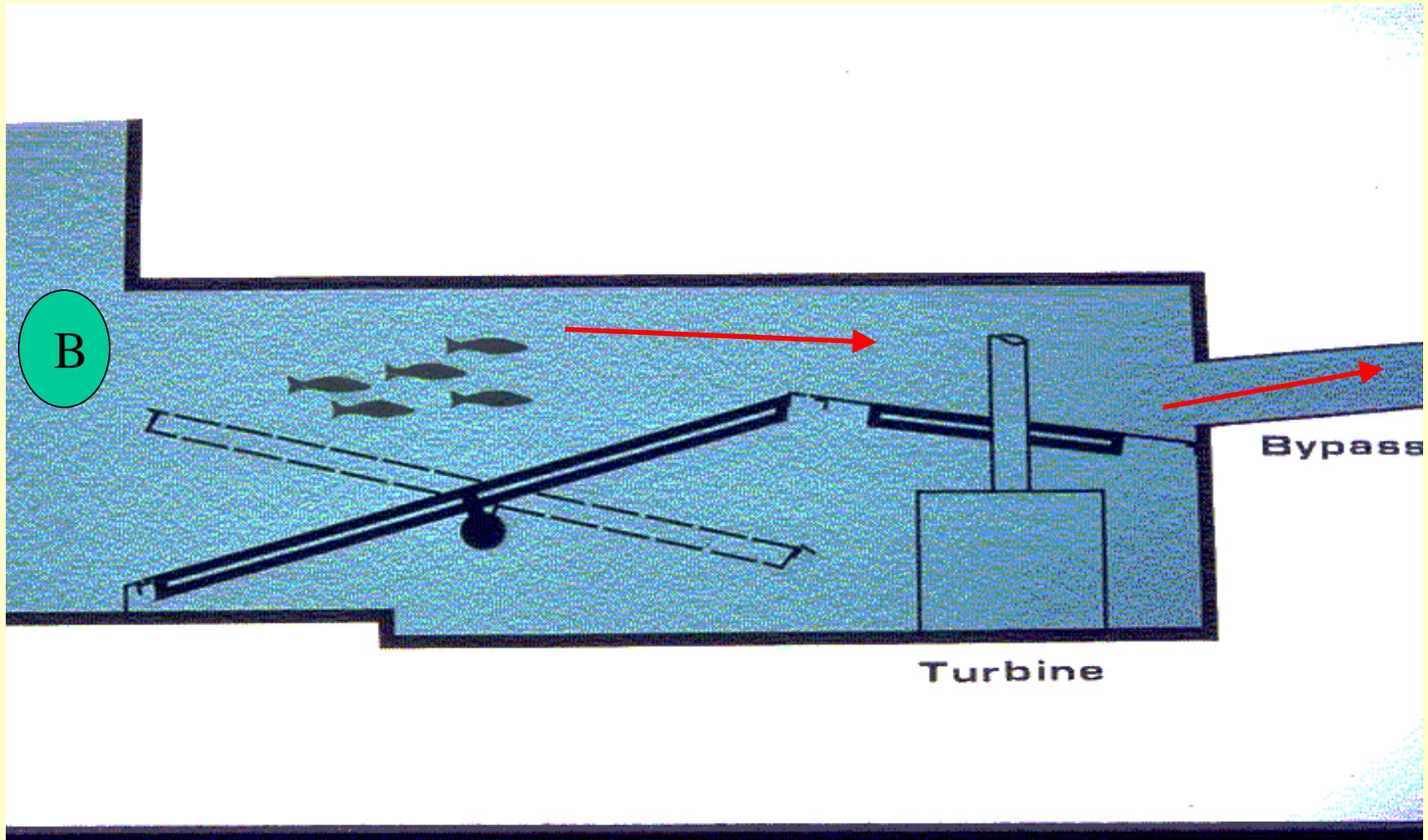


# T.W Sullivan Eicher tilting fish screen, plunge pool, fish Bypass and Evaluator Station.



**FIGURE 1.** Side View of T.W. Sullivan Plant Unit 13 Head Gate, Tilting Fish Screen, Fixed Screen, Bypass Conduit, Knife Gate, Bascule Gate, Fish Bypass Evaluator Plunge Pool and Discharge Box.

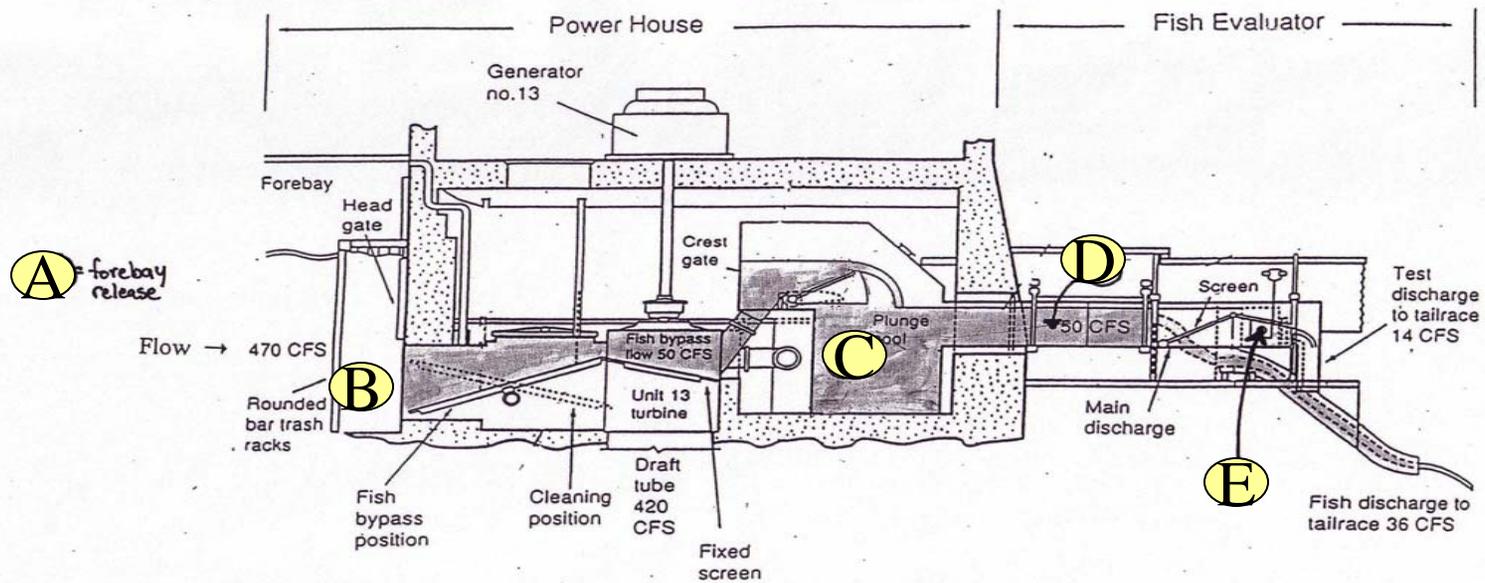
# Side view of T.W. Sullivan Plant Eicher tilting fish screen.



Screen chamber  
2mm bars, 2mm openings, stainless steel  
wedge-wire design.



# T.W Sullivan Fish Bypass and Evaluator Station; Juvenile lamprey release locations.



**FIGURE 1.** Side View of T.W. Sullivan Plant Unit 13 Head Gate, Tilting Fish Screen, Fixed Screen, Bypass Conduit, Knife Gate, Bascule Gate, Fish Bypass Evaluator Plunge Pool and Discharge Box.

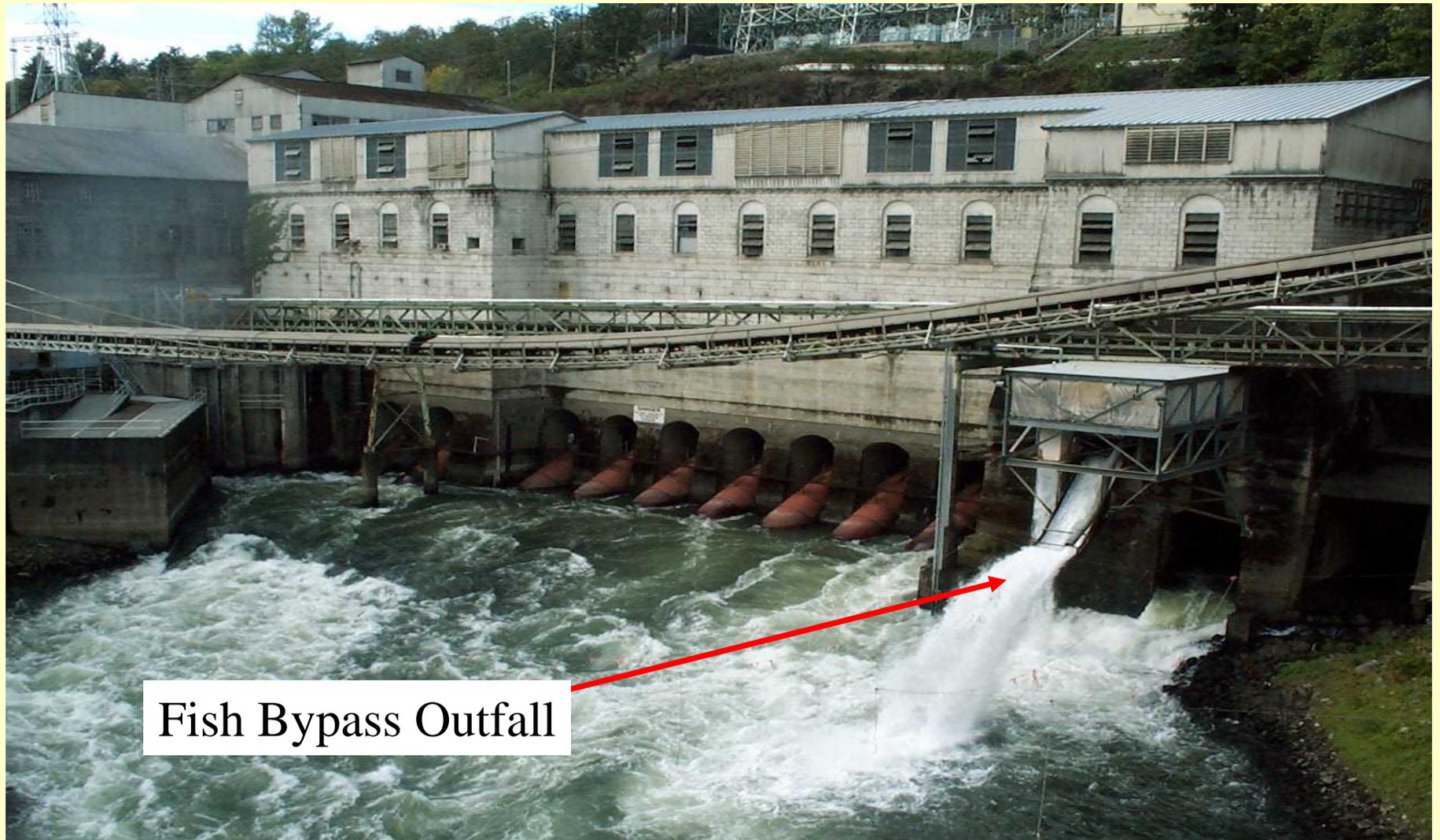
Draft study plan 2004;  
Sullivan bypass plunge pool; 8' deep, grated floor.



# Sullivan fish bypass evaluator station.



# Sullivan Plant Tailrace in Cul-De-Sac Arm of Willamette Falls



Fish Bypass Outfall

# Eicher screen assessment; Draft study plan 2004 PIT tag releases

## Methods; PIT tags

- Lamprey collected from John Day Dam SMF (4/1/04).
- Transported to WF, held in 43°F water for 1 week.
- Surgical implant of 12mm PIT tag (Moursund, 2002).
- Acclimate to ambient river water ~72 hrs. post tagging.
- Hold in ambient river water 24 hrs. prior to release.
- Release two separate groups, at various locations.

## Methods; Mark-recapture

- Whole body dye, 2 separate release groups, recover in evaluator catch tank (extent of recapture effort?).

# Eicher screen assessment; Draft study plan 2004

## PIT tag releases

Point B - Releases directly in front of Eicher screen.

- Objective: % passage and impingement at screen.

Point C - Plunge pool releases.

- Objective: Assess residence time in plunge pool.

Point D - Evaluator test channel.

- Objective: Assess efficacy of PIT tag interrogation of test fish in bypass.

Point E - PIT tag interrogator.

- Objective: Assess efficacy of PIT tag interrogation of all test fish.

# Willamette Falls adult Pacific lamprey research project; 2005.

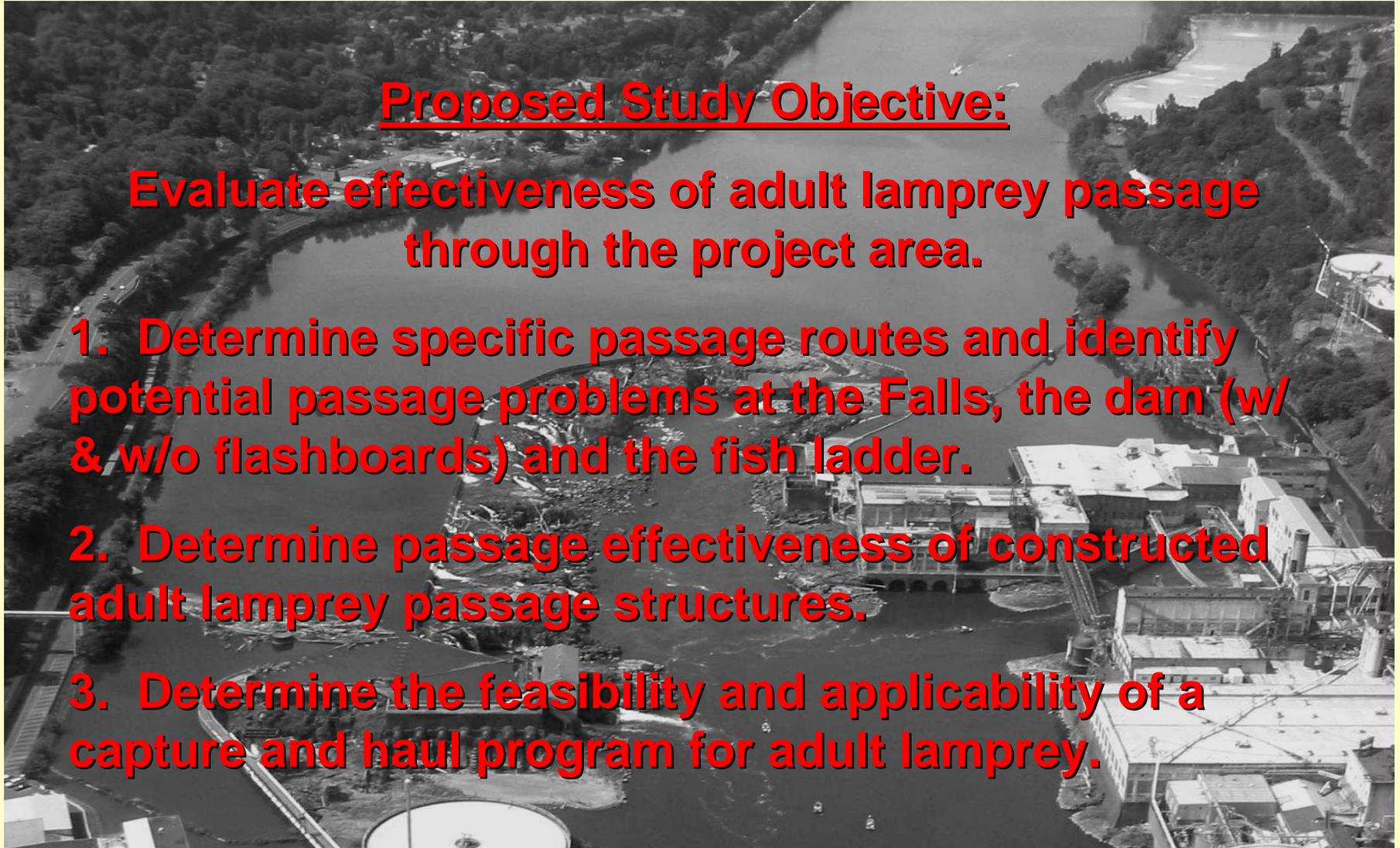


# Willamette Falls adult Pacific lamprey research project; 2005.

## Proposed Study Objective:

**Evaluate effectiveness of adult lamprey passage through the project area.**

- 1. Determine specific passage routes and identify potential passage problems at the Falls, the dam (w/ & w/o flashboards) and the fish ladder.**
- 2. Determine passage effectiveness of constructed adult lamprey passage structures.**
- 3. Determine the feasibility and applicability of a capture and haul program for adult lamprey.**



# Lamprey harvest at Willamette Falls

