TACOMA POWER

3628 South 35th Street
Tacoma, Washington 98409-3192

TACOMA PUBLIC UTILITIES

ORIGINAL

July 14, 2004

VIA FEDEX

Secretary
Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

Re: City of Tacoma, Cowlitz River Project, FERC No. 2016
Settlement Agreement License Article 15 Fish Monitoring Plan

Dear Secretary:

Settlement Agreement License Article 15 requires Tacoma Power to submit a Fish Monitoring Plan within one year of license issuance or July 18, 2004. By letter dated September 26, 2003, FERC established July 18, 2003, as both the effective and issuance date of the license. Enclosed are eight copies of this letter and the referenced plan.

If you have any questions regarding this submittal, please do not hesitate to contact Debbie Young, Natural Resources Manager at (253) 502-8340 or Tom Martin, License Implementation Coordinator, at (253) 502-8298.

Sincerely,

Patrick D. McCarty
Generation Manager

Enclosures

cc: Federal Energy Regulatory Commission, Portland Regional Office
Fisheries Technical Committee (plan w/ attachments)
Jeff Marti, WDOE (plan w/ attachments)

CERTIFICATE OF SERVICE

Federal Energy Regulatory Commission

Project No. 2016
Cowlitz River Hydroelectric Project
City of Tacoma, Tacoma Public Utilities (d.b.a. Tacoma Power)

I hereby certify that I have this day served, by first class or electronic mail, the foregoing document on all parties of record to these proceedings in accordance with the Rules of Practice and Procedure.

Settlement Agreement License Article 15 Fish Monitoring Plan

Dated this 15th day of July, 2004

Thomas E. Martin
License Implementation Coordinator
Tacoma Power
P.O. Box 11007
Tacoma, WA 98411

ORIGINAL

City of Tacoma,
Department of Public Utilities, Light Division
Cowlitz Hydroelectric Project
FERC No. 2016

Settlement Agreement License Article 15

Instream Flow Monitoring Plan

1. Introduction

This plan is prepared in compliance with the requirements of Settlement Agreement License Article 15, contained in Appendix A of the Federal Energy Regulatory Commission's (the Commission) Order Approving Settlement and Issuing New License for FERC Project No. 2016, issued and effective July 18, 2003. The license article requires the City of Tacoma, Department of Public Utilities, Light Division (Tacoma Power) to develop and file a monitoring plan to evaluate the effects of the instream flow requirements upon the fish of the Cowlitz River within one (1) year of license issuance.

Project Description

The Cowlitz Project (FERC No. 2016) is Tacoma Power's largest electricity generating facility and is located on the Cowlitz River, Lewis County, Washington. The Project consists of two dams, the Mayfield Dam at river mile (RM) 52 and Mossyrock Dam, upstream at RM 65. In addition to the project generating electricity and providing flood control, Tacoma operates 3 major parks, manages approximately 14,000 acres of wildlife lands, and owns and funds operation of the Cowlitz Salmon Hatchery (RM 50) and the Cowlitz Trout Hatchery (RM 42). The Barrier Dam, associated with the Cowlitz Salmon Hatchery is located at RM 49.5. The original 50-year license for the Cowlitz Project was issued on December 28, 1951. A new thirty-five year license was issued and became effective on July 18, 2003.

The Mayfield development completed in 1963 includes a 250-foot-high, 850-foot-long, concrete arch and gravity dam that impounds Mayfield Lake, which has a maximum surface area of 2,250 acres. In addition to the Cowlitz River, inflows from the Tilton River also contribute to Mayfield Lake, which supports public and private recreational facilities. An 854-foot-long power tunnel passes through the right abutment of the dam and terminates at a concrete forebay structure. Four penstocks continue from the forebay structure to the four generating units, which have an installed capacity of 162-megawatts (MW).

The Mossyrock development completed in 1968 includes a 606-foot-high double curvature concrete arch dam that creates Riffe Lake, a 23-mile long, 11,830-acre reservoir with 52 miles of shoreline. Riffe Lake supports several parks and other recreational facilities. Three penstocks, varying in length from 248 to 285 feet, extend

down to the powerhouse, which is adjacent to the base of the dam. The powerhouse contains two generating units with room for a third, and has a total installed capacity of 300 MW. Transmission lines link the Mossyrock and Mayfield developments.

2. FERC License Article

Settlement Agreement and License Article 15. Fish Monitoring Plan
Within one year of license issuance, the Licensee shall develop and submit a monitoring plan to evaluate the effects of the instream flow requirements, including pulsing or channel maintenance flows, upon the fish of the Cowlitz River, in consultation with the Fisheries Technical Committee provided for in the August 2000 Settlement Agreement, or if the Settlement Agreement has become void, with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, Washington Department of Fish and Wildlife and Washington Department of Ecology (referred to as "the FTC or agencies"). When a draft plan has been prepared, it shall be provided to all affected agencies and Tribes for 30-day review and comment. The Licensee shall include with the final plan documentation of consultation and copies of comments and recommendations, and specific descriptions of how the final plan accommodates all comments and recommendations. If the Licensee does not adopt a recommendation, the filing shall include the Licensee's reasons, based on Project-specific information. Upon filing, the Licensee shall implement the plan to the extent that such implementation is not contrary to Commission order or regulation and is in conformity with the CWA Section 401 water quality certification. The Commission and WDOE reserve the right to require changes to the plan. Upon Commission and WDOE approval, the Licensee shall fully implement the plan, including any changes required by the Commission or WDOE. Following Commission and WDOE approval, the plan becomes a requirement of the license, enforceable by the Commission and WDOE. If monitoring indicates that instream flows or pulsing flows for channel maintenance are inadequate, the Commission and WDOE separately reserve the right to require modifications to the flow regime, either on their own motion or upon request of state or federal resource agencies.

3. Background

In November 1977, Tacoma entered into an agreement with the Washington Departments of Game and Fisheries (now the WDFW) regarding a flow release schedule from Mayfield Dam. During the re-licensing of the Project, Tacoma, state and federal natural resource agencies, and other interested agencies and groups met to identify issues and develop options to address the environmental impacts of continued operation of the Project. A subgroup of the Fisheries Technical Team, the Instream Flow Subgroup, was convened to address the instream flow regime from Mayfield Dam.

Studies conducted during relicensing by Tacoma's environmental consultant, Harza Engineering Company, specifically addressed river channel formation, floodplains and wetlands connectivity to the river and Chinook spawning (Harza 1999b). Results from

these studies were used in the recommendations for a new instream flow agreement. Some of the findings of these studies are as follows:

1. Project operation has resulted in an alteration of the natural flow regime that has maintained river geomorphology. Instream complexity has been reduced due to Project operations, and free-flowing reaches have been converted to impoundments. Project operations have reduced the channel dominant discharge, reducing the number of days of channel maintenance and gravel transport flows. There has been a loss of channel complexity, encroachment of vegetation and impacts to tributary confluences.
2. The quantity and distribution of spawning gravel from downstream of the Barrier Dam (RM 49.5) to the mouth of the Toutle River (RM 20) does not appear to be a limiting factor to spawning Chinook salmon.
3. The mean monthly flows in April, May and June are lower, up to 50%, than flows that occurred pre-Project. Late summer flows have increased since the Project began operations; mean monthly flows in August and September have averaged 131% and 166% of pre-Project levels, respectively.

Tacoma is required by Settlement Agreement License Articles 9, 10, 13, 14 and 16 to implement actions, to monitor the results of those actions and to create specific habitat conditions in the lower Cowlitz River with the partial intent of restoring habitat-forming processes in the Cowlitz River to benefit fish. These include gravel augmentation, woody debris addition, habitat protection and transport flows directed at protecting fish during sensitive life stages. In addition each of the License Articles has specific monitoring and reporting requirements.

4. Objectives

The intent of this plan is to monitor and evaluate the instream flow release schedule required in License Article 15 upon the fish of the lower Cowlitz River, specifically in regard to the findings of the re-licensing studies detailed above.

1. Evaluate the impact of Project flows, and the instream flow schedule, upon the channel forming process and the channel floodplain interaction in the Cowlitz River from the Barrier Dam to the mouth of the Toutle River.

2. On an annual basis, evaluate the impact of Project flows, and the instream flow schedule, upon fall Chinook spawning habitats in the Cowlitz River from the Barrier Dam to the mouth of the Toutle River.

3. On an annual basis, evaluate the impact of Project flows, and the instream flow schedule, upon fall Chinook redd formation and maintenance in select areas of the Cowlitz River from the Barrier Dam to the mouth of the Toutle River.

4. Verify the findings of the relicensing studies of the fish transport flow affects upon downstream migrant salmoninds in the lower Cowlitz River.

5. In conjunction with other evaluation and habitat studies conducted concurrently on the lower Cowlitz River evaluate the distribution of rearing salmonid populations to identify high value or critical habitats.

5. Plan

Channel Forming Process

Lower Cowlitz River:

The natural diversity associated with channel migration is reduced when flood control discharges are limited in regulated river systems such as the Cowlitz River. The goal of the U.S. Army Corps of Engineers flood control provisions on the Cowlitz River is to evacuate Mossyrock reservoir as quickly as possible following flood events so that storage space is available to accommodate additional floodwaters. This schedule can result in sustained, high flows in the lower Cowlitz River, which while not technically considered flood flows, act or perform as such.

Fixed point photo monitoring and aerial photo monitoring will be used in conjunction with mapping techniques to observe and track the channel changes of the Cowlitz River from RM 50 downstream to RM 20[1]. A baseline photo data set has been collected from relicensing studies and from 2003 aerial flights. These maps and photos are included in Appendix 1. Gaps in the proposed baseline photo data set will be filled with photographs taken in 2004.

All records and photo data set will be repeated in years 3 and 8 of the license to develop a semi-decadal report of conditions. The monitoring of the channel forming process by the photo data sets will be collected at the sites listed below (see Study Sites – Channel Forming Process) following sustained high flow events. The photo data set would also be repeated after a "post-Cowlitz River Project" 5-year flow event of 34,600 cubic feet per second (Harza Northwest 1996). Regardless of flow events the photo data sets will be repeated in years 3 and 8.

1. Fixed point sites:

    a. RM 50.0 – Cowlitz Salmon Hatchery
    b. RM 49.5 – Barrier Dam
    c. RM 49.2 - Mouth of Mill Creek
    d. RM 47.0 – Cowlitz Timber Trails side channel
    e. RM 44.5 – Unnamed side channel

[1] All river mile (RM) references are from a U.S. Army Corps of Engineers (ACOE) aerial survey of the Cowlitz River conducted October 13, 1978 (ACOE 1978).

f. RM 42.5 – Otter Creek side channel
g. RM 42.0 – Cowlitz Trout Hatchery
h. RM 41.3 – Mouth of Blue Creek
i. RM 37.7 – IFA Nursery (view upstream)
j. RM 33.5 – Toledo, upstream from bridge
k. RM 33.5 – Toledo, downstream from bridge
l. RM 33.0 – Below Toledo, Washington
m. RM 29.8 – Interstate-5 bridge
n. RM 27.5 – Wallace Ponds
o. RM 24.4 – Olequa boat launch
p. RM 20.0 – Toutle River confluence

2. Aerial photography sites:

a. RM 52.0 – Mayfield Dam
b. RM 50.0 – Cowlitz Salmon Hatchery
c. RM 49.5 – Barrier Dam
d. RM 49.2 - Mouth of Mill Creek
e. RM 46.5 – Cowlitz Timber Trails development
f. RM 44.5 – unnamed side channel
g. RM 40.0 – Bear Paw drift
h. RM 37.7 – IFA Nursery
i. RM 36.5 – unnamed side channel
j. RM 36.0 – Massey Bar boat launch
k. RM 33.0 – unnamed side channel
l. RM 31.0 – unnamed side channel
m. RM 30.5 – unnamed side channel
n. RM 26.0 – unnamed side channel
o. RM 25.2 – Car Body Hole
p. RM 20.0 – Toutle River confluence

Spring and Fall Chinook Spawning Monitoring

Lower Cowlitz River:

1. Carcass sampling and coded wire tag recovery efforts will begin on September 1 annually. Surveys will occur on the Cowlitz River from the Barrier Dam to the mouth of the Toutle River by boat to recover Chinook carcasses. Carcasses will be sampled for origin (hatchery vs. wild), race (spring vs. fall), sex, age and length. Snouts will be collected from all Chinook identified with coded wire tags. See Appendix 3 for an example of the data set collected annually.

2. Spring and fall Chinook aerial spawning surveys will occur annually to monitor natural spawning populations and identify high quality habitat areas in the Cowlitz River from the Barrier Dam downstream to the mouth of the Toutle River. Data collected will include adult fish and redd distributions. Flights will begin in

mid-September, and occur every other week until aerial observations are impaired by high water (usually late in November). See Appendix 3 for an example of the data set collected annually.

3. Chum salmon spawning surveys will occur concurrently with the Chinook spawning surveys to monitor natural spawning populations of chum in the lower Cowlitz River downstream to the mouth of the Toutle River. Data collected will include adult fish and redd distributions; run timing based on spawning and abundance estimates. Data collected from aerial surveys will be augmented with walking surveys on the lower Cowlitz River, including some tributary mouths, to enumerate and monitor redds, and to collect samples for stock analysis.

4. Spring and fall Chinook redd surveys will occur annually. Surveys for potential redd dewatering and adult distributions of natural spawning Chinook populations will take place (see Study Sites – Fall Chinook Spawning Monitoring) by foot in the main channel of the Cowlitz River at:

    a. RM 42.4 (Ken Hanson's)
    b. Side channel site RM 42.5 (Otter Creek side channel)
    c. Side channel site RM 47 (Cowlitz Timber Trails side channel)

    The side channel sites were specified in License Article 13 and in the *Order Modifying Decision and Granting Petition for Reconsideration, and Modified Final Findings of Facts and Conclusion of Law, PCHB No. 02-022 (dated January 24, 2003)*, however, the Otter Creek side channel river mile is altered from the designation listed in the License and in the Pollution Control Hearings Board Order. The Cowlitz Fisheries Technical Committee (FTC) approval for the change in this redd monitoring site is pending (see Appendices 4 and 5).

    Data collected during the redd surveys will include redd counts, adult and jack counts, selected redd pit depths, tail spill area, overall redd length and width and river flow levels.

Downstream Migrant Transport Flow Evaluation

The objective of this study is to document the survival and travel times to the Columbia River of natural-origin and hatchery-origin downstream migrant juvenile salmonids released from the Cowlitz Salmon Hatchery (CSH) or from the stress relief ponds (SRP) at the CSH. The survival and travel times will be used to assist in the evaluation of the weekly (March through June) fish transport flows below Mayfield Dam. Generally it is desirable to maximize the downstream migrant transport rate to minimize exposure to resident fish predators, avian predators and disease (Mighetto et. al. 1994)

Methods

The study will use; thirty unmarked coho, thirty unmarked steelhead and thirty unmarked Chinook outmigrants collected from the Cowlitz Falls juvenile fish collection facility (CFFCF), and thirty marked coho, thirty marked steelhead and thirty marked Chinook outmigrants collected from the CSH. All fish will be gastrically implanted with a radio transmitter and released from the stress relief ponds outfall at the CSH. The fish will be fitted with the longest-lasting tag possible for the size of the fish. Radio-tagged fish will be released from the SRP in groups starting in mid-May and continuing to mid-June.

A data-logging receiver will continuously monitor the reach downstream of the SRP outlet from River Mile at RM 49.5. This reach coincides with the area from the Barrier Dam to the Barrier Dam boat ramp, and will hereafter be referred to as the Barrier Dam area (BDA). The receiver will determine the time and date that each tagged fish first entered the Cowlitz River and left the BDA.

A second data-logging receiver will monitor the Cowlitz River at the Longview water intake (LWI), located at RM 5.2. This receiver will be used to determine the survival rate and travel time required for each radio-tagged fish to migrate from the SRP to the mouth of the Cowlitz River.

A boat will be used to intermittently mobile track radio-tagged fish after the first release in order to assure the fate of all tagged fish. Mobile tracking will be accomplished by equipping the boat with antennas and a receiver and traveling the river from the Barrier Dam to the Columbia River in search of radio-tagged fish. When a tagged fish is detected, its location in the river (by river mile) will be recorded on a U.S. Geological Survey (USGS) 1:24,000 topographic map.

Fish travel times will be determined for three distinct periods:

1. Time spent at the BDA. Time from the first record at the Barrier Dam (fish enters the river) until the last record at the BDA. This measurement will be used to determine when the fish began to actively migrate downstream.
2. BDA to LWI. Time frame from the last detection record at the BDA to the first detection record at Longview (approximately 44 river miles). These data will be used to quantify fish travel time from the BDA to the LWI.

3. Total time in Cowlitz River. First record at BDA to first record at LWI. The values obtained from this measurement will be used to determine the total time the migrants were exposed to the Cowlitz River environment.

Fish survival will be determined by the presence of a tagged fish at the LWI station.

Distribution of rearing salmonid populations

In conjunction with monitoring studies of Chinook redds (as proposed in this plan) and monitoring studies of natural-origin fall Chinook juveniles in the lower Cowlitz River (proposed in the evaluations and monitoring section of the Cowlitz Fisheries and Hatchery Management Plan), as well as building upon the information gathered during relicensing studies that identified high quality juvenile rearing habitat in the lower Cowlitz River (Harza 2000), studies will be conducted to locate the distribution of rearing salmonids in the lower Cowlitz River.

Methods
Juvenile fall Chinook will be captured by seining in the lower Cowlitz River above the mouth of the Toutle River. To develop survival estimates of natural-origin fall Chinook from the Cowlitz River unmarked Chinook will be wire tagged and released back into the river at the collection site, or a nearby location. In addition, observations and studies conducted in support of License Article 11 (Fish Habitat Fund) to preserve and protect essential juvenile salmonid habitat in the lower Cowlitz River will be drawn upon to recognize the highest quality habitats, and increase the priority of those sites for protection.

7. Schedule

The Chinook redd surveys and the aerial flights will occur annually beginning in year 1 following the Commission's approval of the plan.

The channel forming process baseline study will occur and continue in year 1. Subsequent studies will occur following an appropriate flow event, but no later than year 3. This study will be repeated on a like schedule beginning in year 8.

The transport flow migrant study will occur in year 2.

The distribution of rearing salmonids study will occur annually by the gathering of data from all monitoring activities and reported as proposed below.

Data collected on an annual basis will be reported in the annual report on program metrics required by NOAA Fisheries (NOAA Fisheries 2004).

An interim report on the impacts of Tacoma's instream flow schedule on the fish resources of the lower Cowlitz River will be filed with the Commission by December 31

of year 5 and a final report, including agency consultation and responses to agency comments, will be filed to the Commission in year 10.

8. *Consultation and Comments*

Communication/Consultation - Cowlitz Hydroelectric Project FERC No. 2016.
Settlement Agreement License Article 15. Fish Monitoring Plan

Date	Agencies/ Committees	Participants	Type of Communication	Topics
September 2, 2003	*Cowlitz Fisheries Technical Committee*	*Tacoma Power, WDFW, NOAA, WDOE, USFWS & CC*	*Meeting*	• *Instream flow consultation per License Article 13 (c), including discussions relevant to study plan.*
October 2, 2003	Cowlitz Fisheries Technical Committee	Tacoma Power, WDFW, NOAA, USFWS, WDOE, YN & CC	Letter report	• Updated information *distributed to FTC on* locations of fall Chinook spawning survey sites.
October 14, 2003	Cowlitz Fisheries Technical Committee	Tacoma Power & CC	Meeting	• Discussion of fall Chinook spawning survey sites and discussion of flow impacts.
November 4, 2003	Cowlitz Fisheries Technical Committee	Tacoma Power, WDFW, NOAA, USFWS & CC	Meeting	• Further discussions fall Chinook spawning survey sites and flow impacts.
March 2, 2004	Cowlitz Fisheries Technical Committee	Tacoma Power, YN, USFWS & CC	Meeting	• Discussion of Cowlitz River *transport flows and* notification of Fish Monitoring Plan distribution schedule.
June 10, 2004	Cowlitz Fisheries Technical Committee (partial)	Tacoma Power, WDFW, WDOE, NOAA, USFWS & YN	Draft plan	• Distribution of draft Fish Monitoring Plan for review.

Abbreviations

AR	American Rivers
BPA	Bonneville Power Administration
CC	Conservation Caucus (TU & AR)
CIT	Cowlitz Indian Tribe
CWA	Cowlitz Wildlife Area
DNR	Department of Natural Resources
FTC	Fisheries Technical Committee
GCDE	Governor's Committee on Disability Issues and Employment
IAC	Interagency Committee for Outdoor Recreation Tacoma Power
LCBC	Lewis County Board of Commissioners/Lewis County
LCPUD	Public Utility District No. 1 of Lewis County
LCSO	Lewis County Sheriff's Office

NOAA	NOAA Fisheries
TU	Trout Unlimited
USDAFS	U.S. Department of Agriculture – Forest Service
USFWS	U.S. Fish and Wildlife Service
WDOE	Washington Department of Ecology
WDFW	Washington Department of Fish and Wildlife
WMCC	Wildlife Management Coordinating Committee includes USFWS, WDFW,
WSPRC	Washington State Parks and Recreation Commission
YN	Yakama Nation

Comments

No comments were received on the final draft of this plan from the affected agencies and Tribes.

9. References

ACOE. 1978. U.S. Army Corps of Engineers. Aerial Photographs, Cowlitz River, Washington. Mouth to Packwood. Portland District. October 1978.

Harza. 1996. *Cowlitz Hydroelectric Project, FERC No. 2016. Initial Consultation Package*. Prepared for Tacoma Power. Harza Engineering Company. May 1996.

Harza. 1999b. *Cowlitz Hydroelectric Project, FERC No. 2016. 1997 and 1998 Technical Study Reports, Volume 1: The 1997 Studies and Volume 2: The 1998 Studies*. Prepared for Tacoma Power. Harza Engineering Company. January 1999.

Harza. 2000. *Cowlitz Hydroelectric Project, FERC No. 2016. 1999 Technical Study Reports*. Prepared for Tacoma Power. Harza Engineering Company. March 2000.

Mighetto, L. and W.J. Ebel. 1994. *Saving the Salmon: A History of the U.S. Army Corps of Engineers' Efforts to Protect Anadromous Fish on the Columbia and Snake Rivers*. Prepared for U.S. Army Corps of Engineers, North Pacific Division, Portland and Walla Walla Districts. Historical Research Associates. Seattle, Washington. September 1994.

NOAA Fisheries. 2004. *Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Consultation. Operation of the Cowlitz River Hydroelectric Project (FERC No. 2016) through 2038.* Prepared for Federal Energy Regulatory Commission. NOAA Fisheries, Northwest Region, Hydropower Section. March 23, 2004.

TACOMA POWER

3628 South 35th Street
Tacoma, Washington 98409-3192

TACOMA PUBLIC UTILITIES

June 10, 2004

Craig Burley
Washington Department of Fish and Wildlife
2108 Grand Blvd.
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Lou Ellyn Jones
U.S. Fish and Wildlife Service
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Jeff Marti
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George Lee
Yakama Nation
Fisheries Resources Management
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Toppenish, WA 98949

Michelle Day
NOAA Fisheries
Hydropower Division
525 NE Oregon Street, Suite 500
Portland, OR 97232

Mr. John Barnett
Chairman
Cowlitz Indian Tribe
P.O. Box 4
Aberdeen, WA 98520

Re: Cowlitz River Project, FERC No. 2016
Settlement Agreement License Article 15
Draft Fish Monitoring Plan

Dear Madam and Sir:

The Cowlitz License Settlement Agreement (SA) Article 15, Fish Monitoring Plan, requires Tacoma Power to submit the draft plan to the "affected agencies and Tribes to comment and make recommendations" for a 30-day period prior to filing these plans with the Federal Energy Regulatory Commission (FERC) for approval. The license requires this plan to be filed with FERC on or before July 18, 2004.

Enclosed is the draft of the Fish Monitoring Plan as required by SA Article 15. Please review the enclosed plan and provide any comments to Tacoma Power by close of business July 12, 2004 to Mark LaRiviere via mail at the address on the letterhead or via e-mail to mlarivie@ci.tacoma.wa.us. Your comments will be addressed in the final plan that is filed with FERC.

If you have any questions, feel free to contact Mark at (253) 502-8767 or me at (253) 502-8298 or thomas.martin@cityoftacoma.org.

Sincerely,

Thomas Martin

[redacted]
License Implementation Coordinator
Natural Resources

TEM/ls

Enclosure

cc: M.G. LaRiviere (w/ enclosure)
Brad Caldwell, Washington Department of Ecology (w/ enclosure)

TACOMA POWER

3628 South 35th Street
Tacoma, Washington 98409-3192

TACOMA PUBLIC UTILITIES

May 3, 2004

Craig Burley
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2108 Grand Blvd.
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Jim Tuggle
Washington Council, Trout Unlimited
3092 Hampton Dr. S.W.
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Michelle Day
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Hydropower Division
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Portland, OR 97232

Clifford Casseseka
Yakama Nation
Fisheries Resources Management
P.O. Box 151
Toppenish, WA 98949

Cowlitz Fisheries Technical Committee members:

Enclosed for your review is a copy of the draft Instream Flow Monitoring Plan submitted per the requirement of Cowlitz License Article 15. Comments on this review draft are due to Tacoma Power on May 19, 2004.

If you have any questions feel free to contact me at (253) 502-8767 or at mlarivie@cityoftacoma.org.

Sincerely,

Mark G. LaRiviere
Senior Fisheries Biologist
Natural Resources

MGL/ls
Enclosure

1) FTC review draft Instream Flow Monitoring Plan[1]

[1]Hand delivered to Cowlitz FTC members at May 4, 2004 meeting – Mayfield Office, Cowlitz Hydroelectric Project.

Appendices

1. Study Sites – Channel Forming Process Study
2. Study Sites – Fall Chinook Spawning Monitoring
3. Cowlitz River fall and spring Chinook carcass survey data – example from 2003.
4. Letter report to the Cowlitz Fisheries Technical Committee, October 2, 2003.
5. October 14, 2003 FTC meeting summary.

Appendix 1.

Study Sites

Channel Forming Process Study

Maps and baseline photographs

LARGE-FORMAT IMAGES

One or more large-format images (over 8 ½" X 11") go here.
These images are available in FERRIS at:

For Large-Format(s):
Accession No.: 20040721-0306

Security/Availability:

- ☑ PUBLIC
- ☐ NIP
- ☐ CEII
- ☐ NON-PUBLIC/PRIVILEGED

File Date: 7-19-04 Docket No.: P-2016

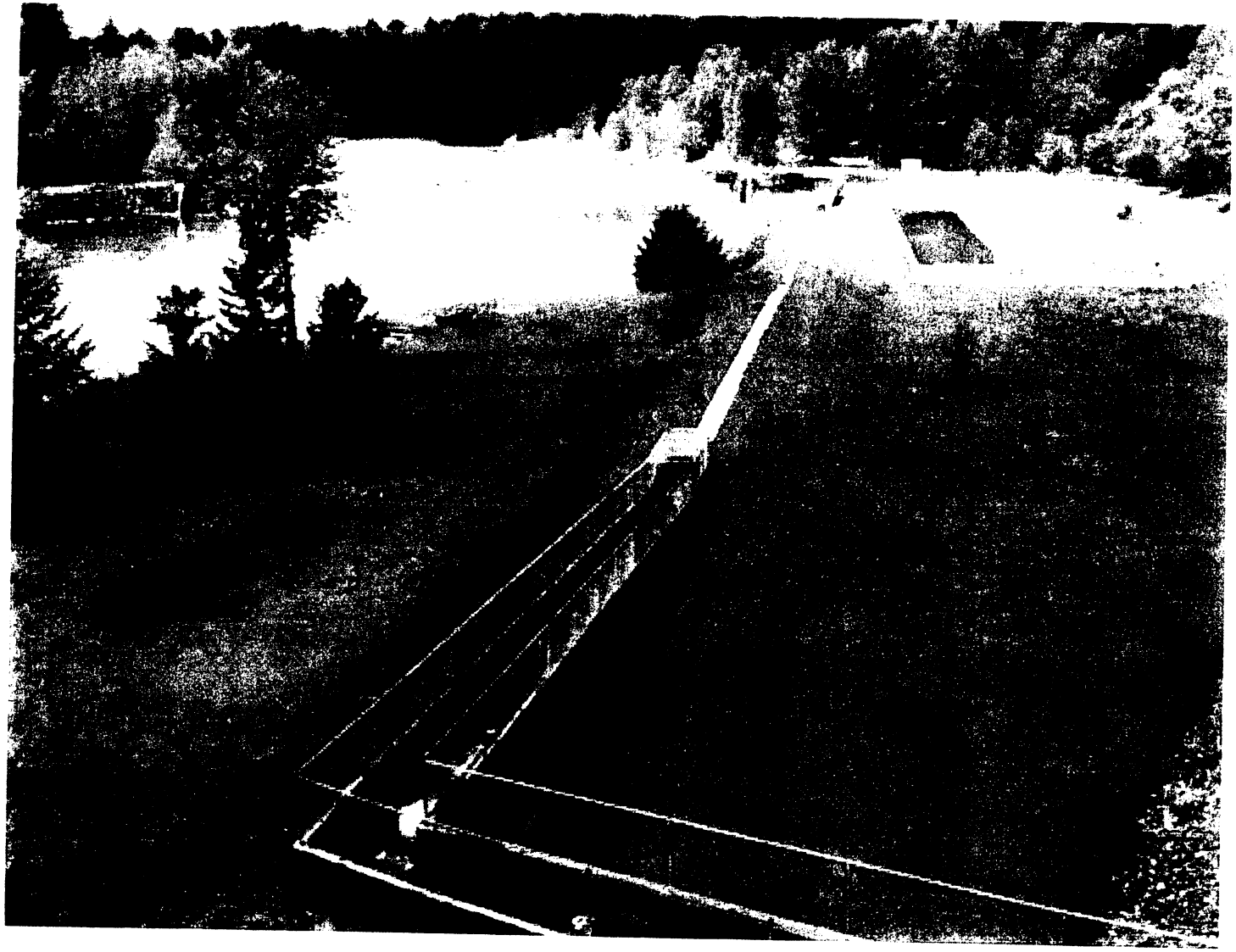
Parent Accession No.: 20040721-0305

Set No.: 1 of 1

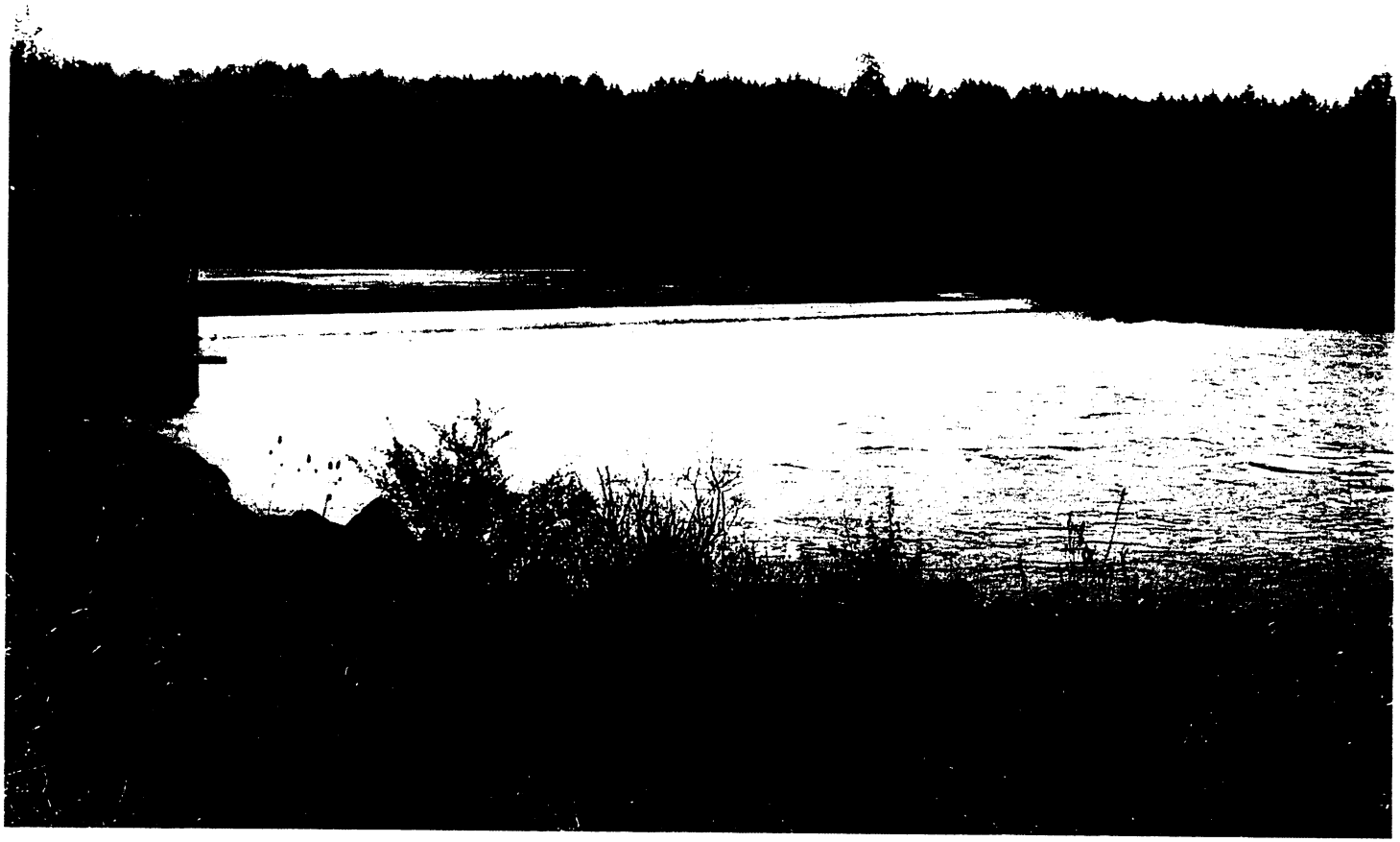
Number of page(s) in set: 9

TRP-G REV.- 4/2003 (yellow)

FIXED SITES



RM 50.0 — Cowlitz Salmon Hatchery



RM 49.5 — Barrier Dam

RM 49.2 — Mouth of Mill Creek

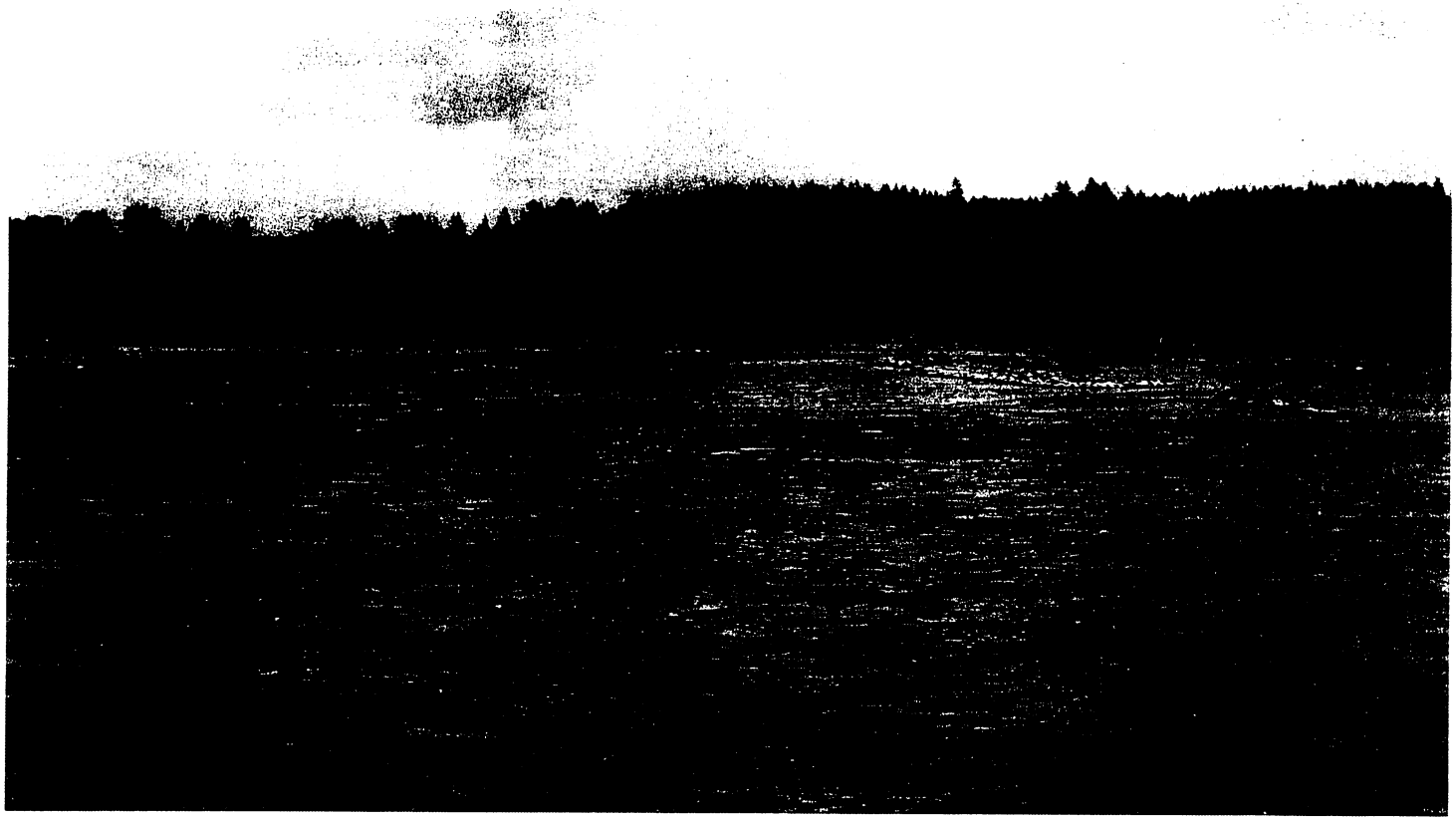
RM 47.0 — Cowlitz Timber Trails side channel

RM 44.5 — Unnamed side channel

RM 42.5 — Otter Creek side channel

RM 42.0 — Cowlitz Trout Hatchery

RM 41.3 — Mouth of Blue Creek

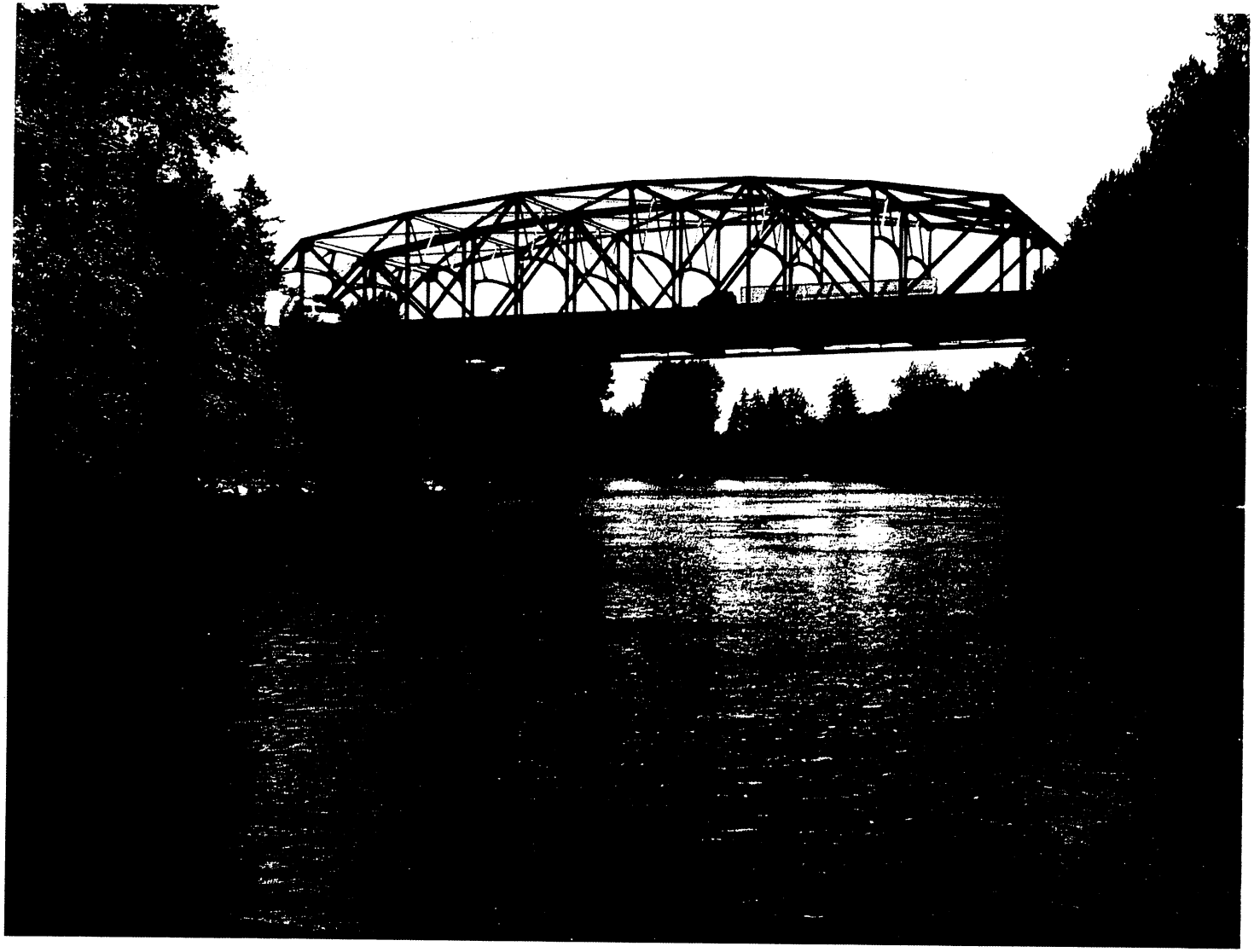


RM 37.7 — IFA Nursery (view upstream)

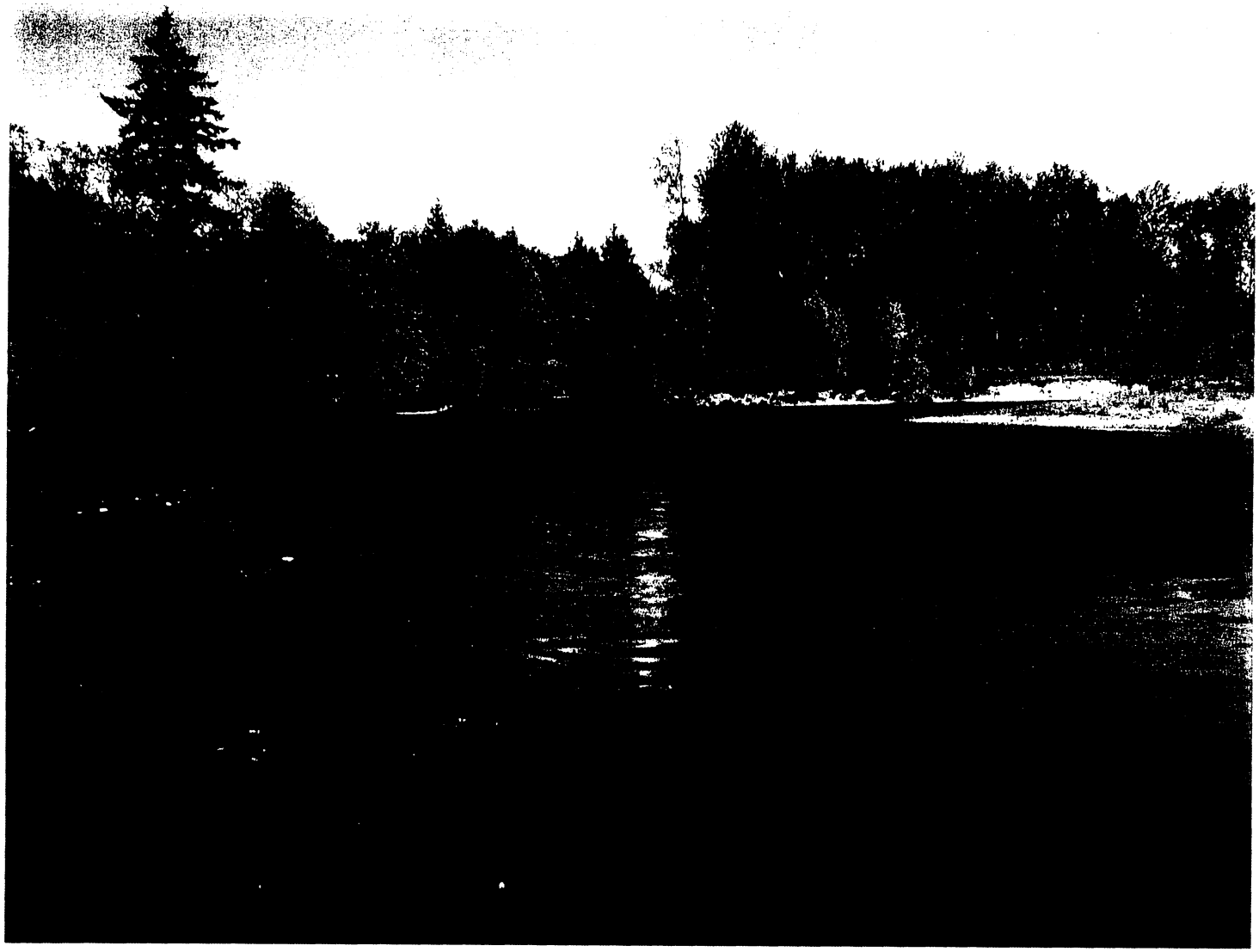
RM 33.5 — Toledo, WA, upstream from bridge

RM 33.5 — Toledo, WA, downstream from bridge

RM 33.0 — Below Toledo, WA

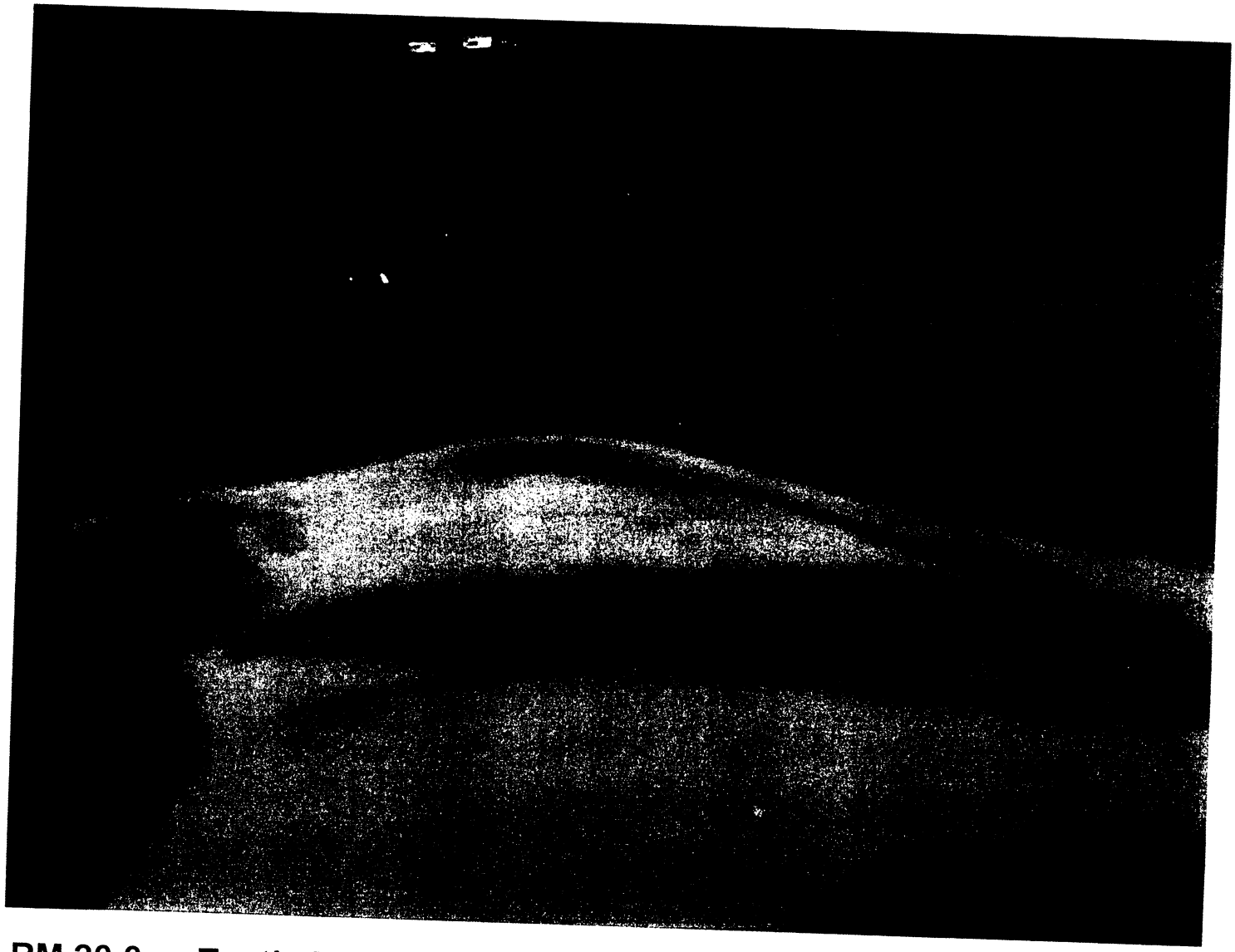


RM 29.8 — Interstate 5 bridge



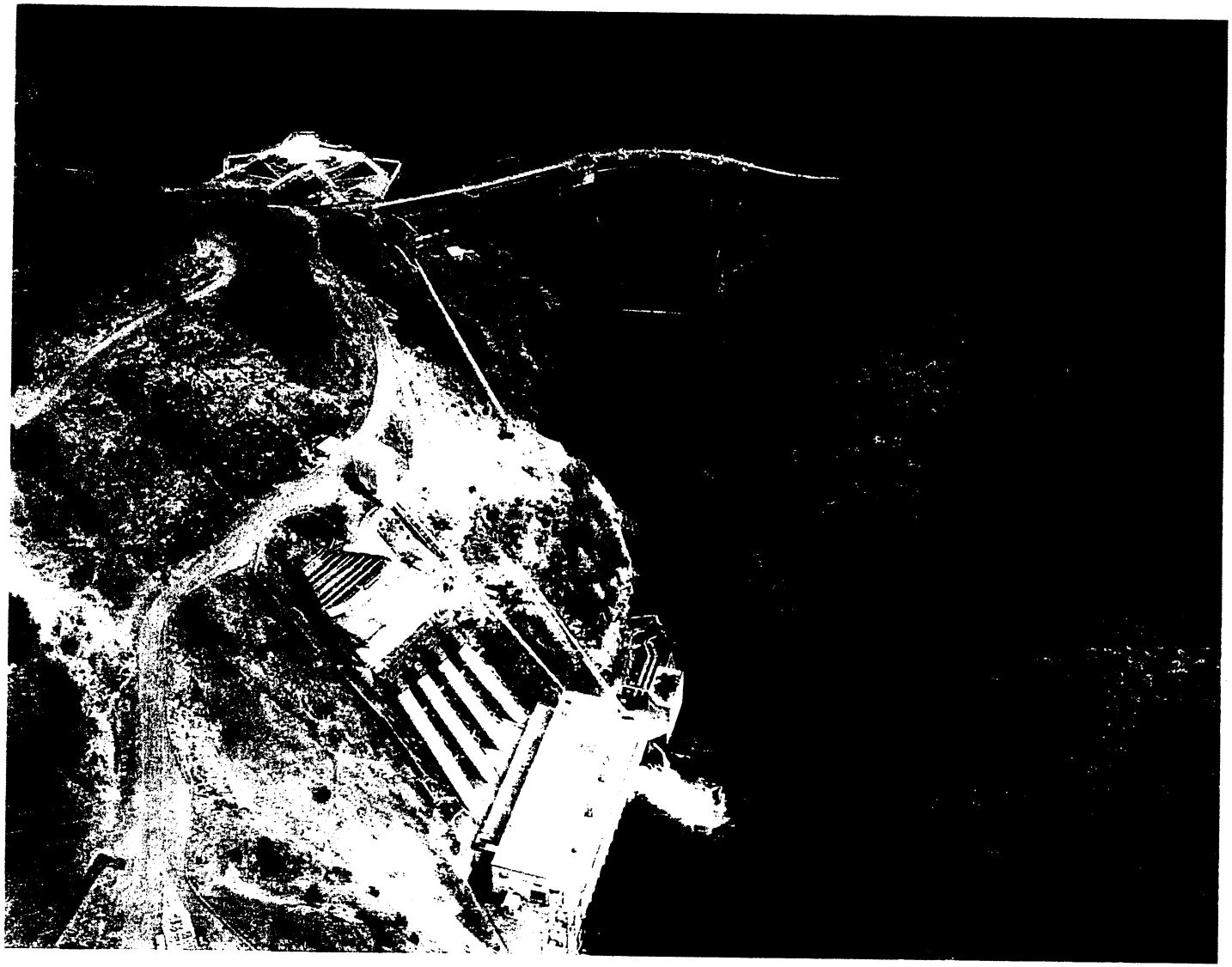
RM 27.5 — Wallace Ponds

RM 24.4 — Olequa boat launch

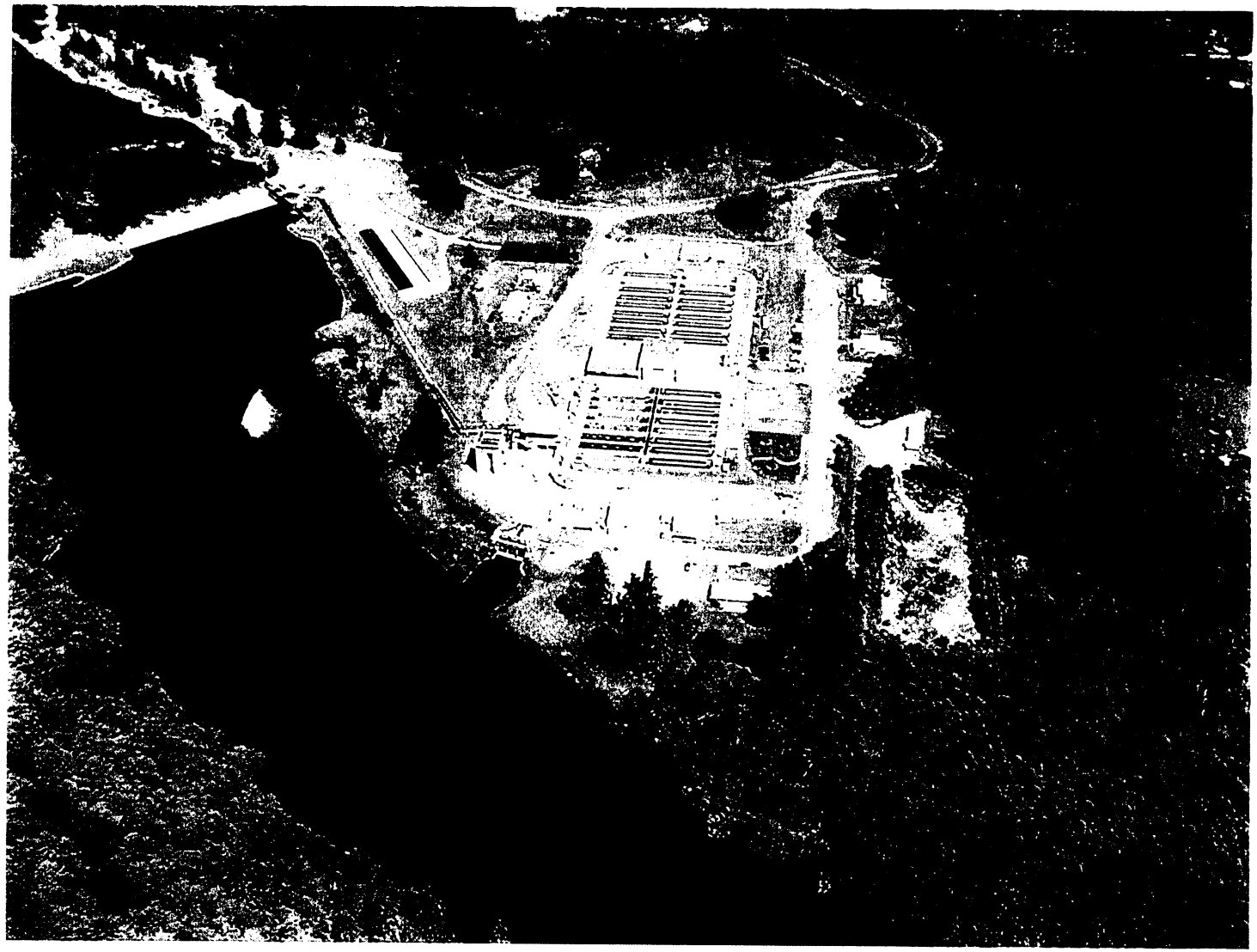


RM 20.0 — Toutle River confluence

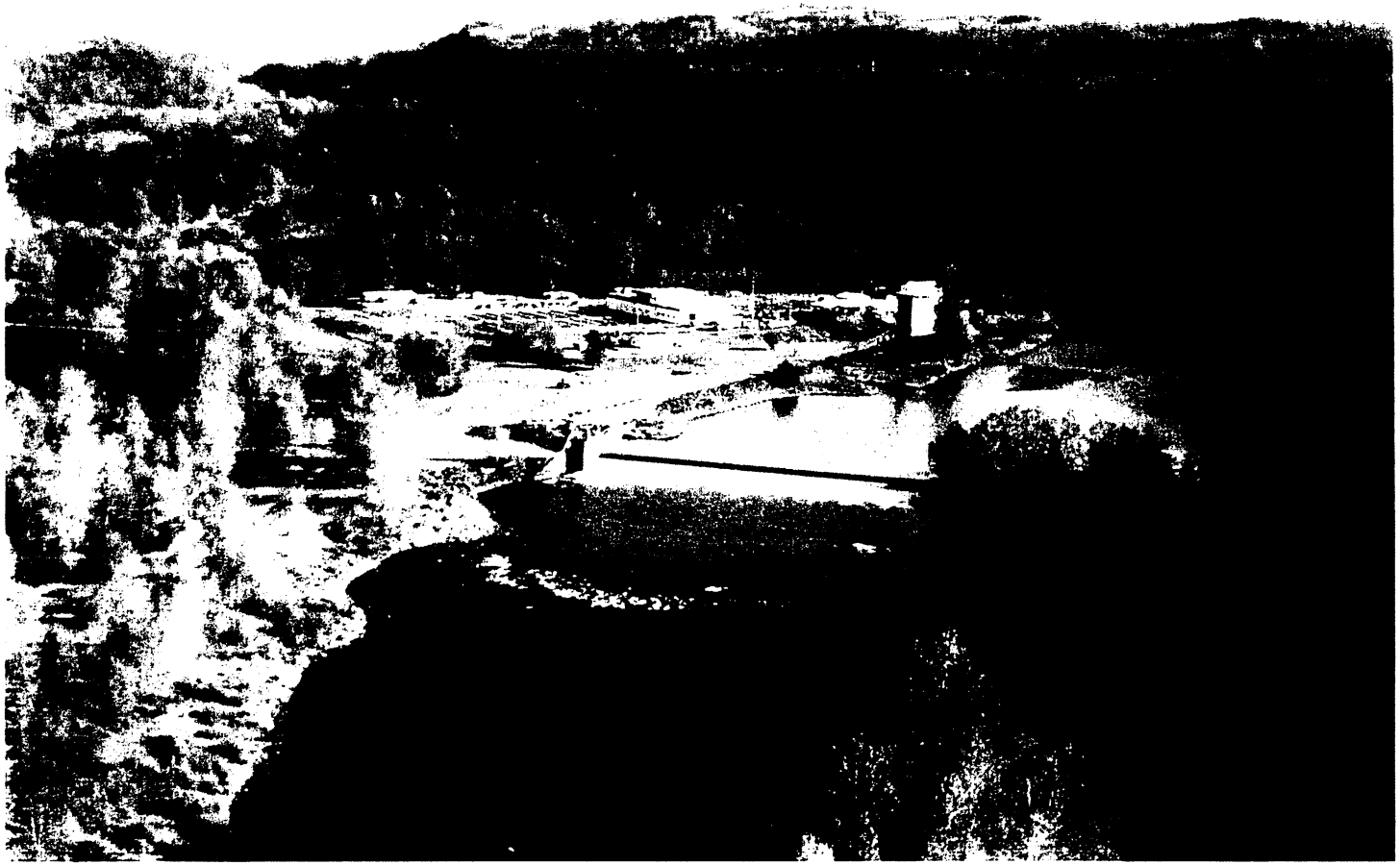
AERIAL SITES



RM 52.0 — Mayfield Dam



RM 50.0 — Cowlitz Salmon Hatchery



RM 49.5 — Barrier Dam

RM 49.2 — Mouth of Mill Creek

RM 46.5 — Cowlitz Timber Trails development

RM 44.5 — Unnamed side channel

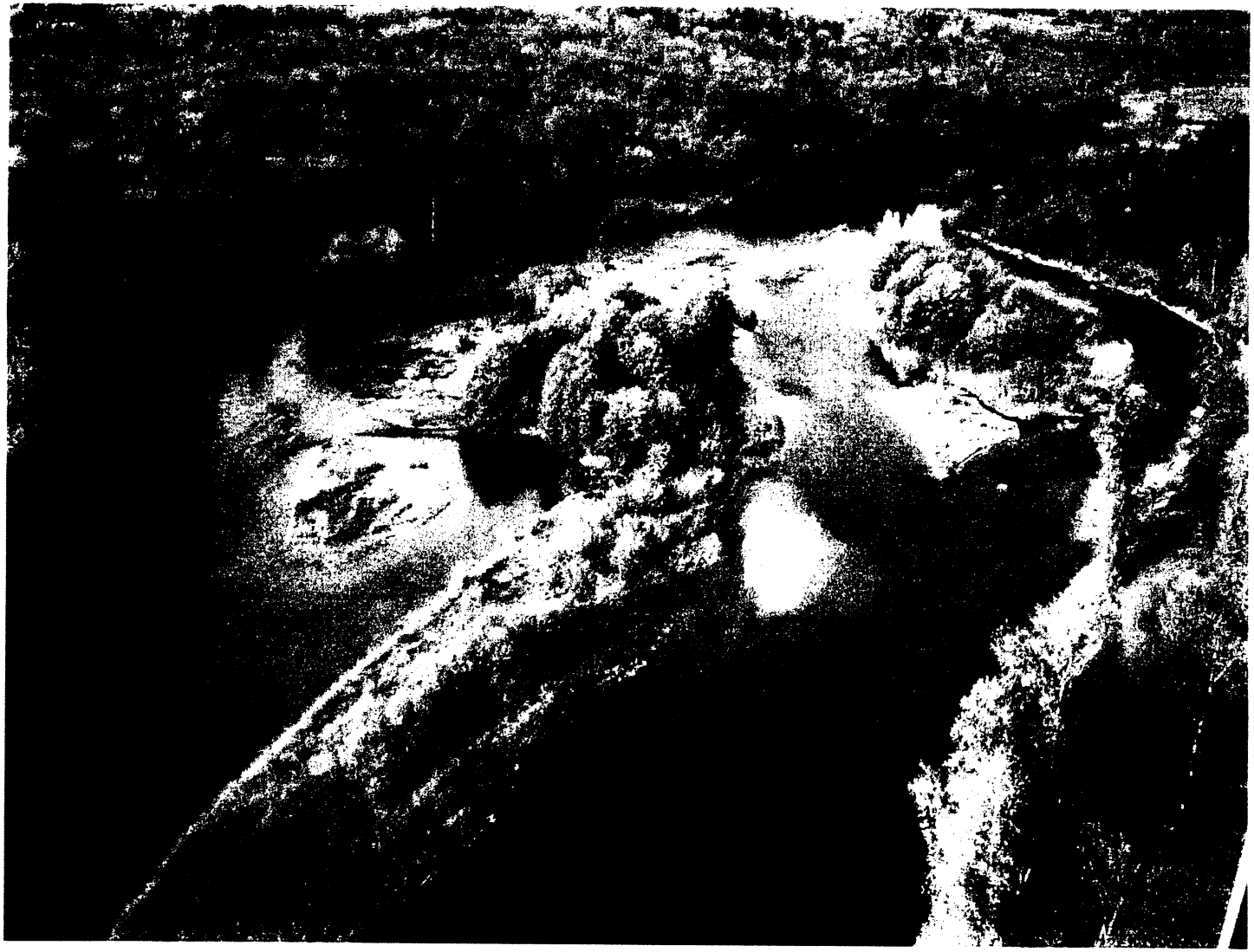
RM 40.0 — Bear Paw drift

RM 37.7 — IFA Nursery

RM 36.5 — Unnamed side channel

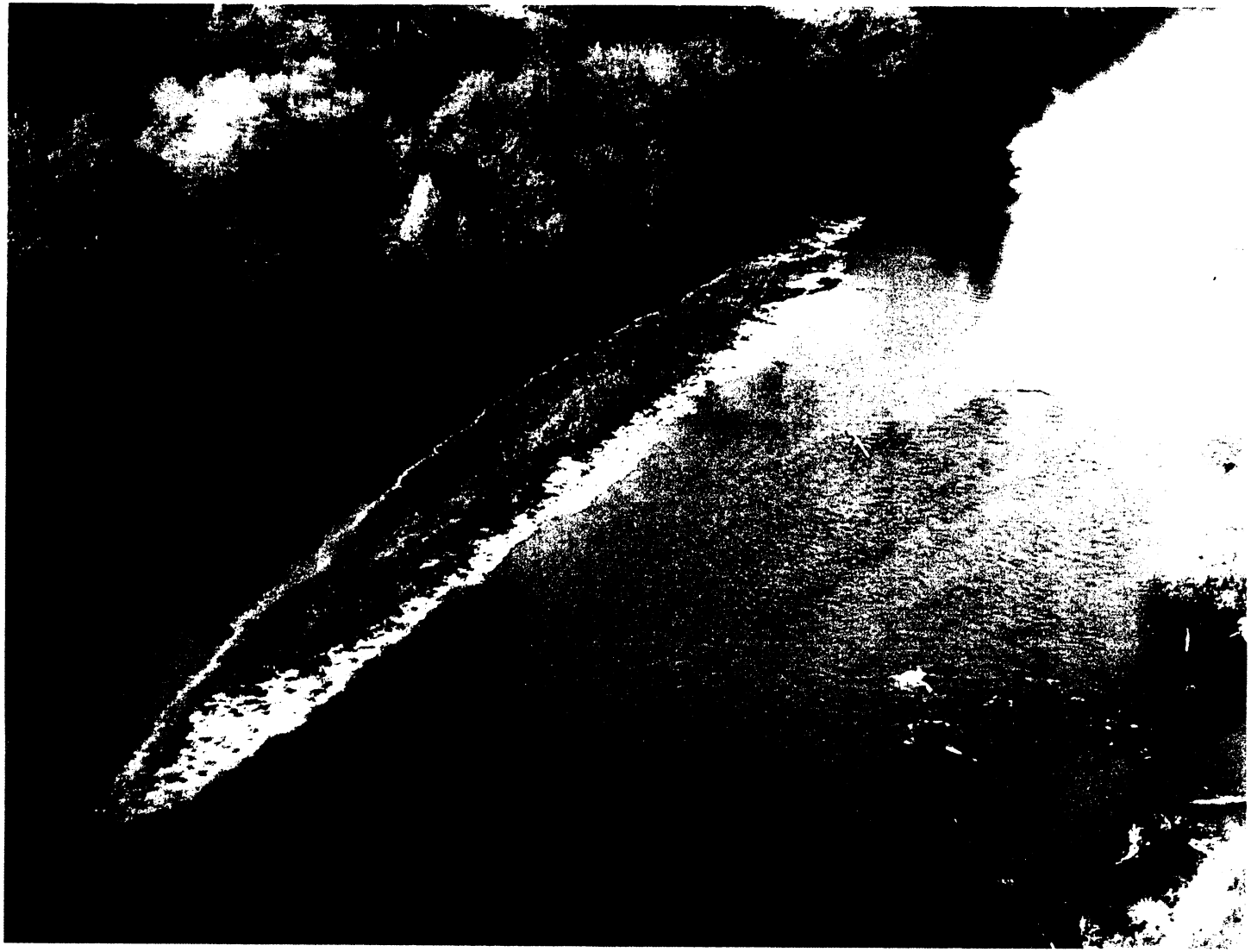
RM 36.0 — Massey Bar boat launch

RM 33.0 — Unnamed side channel



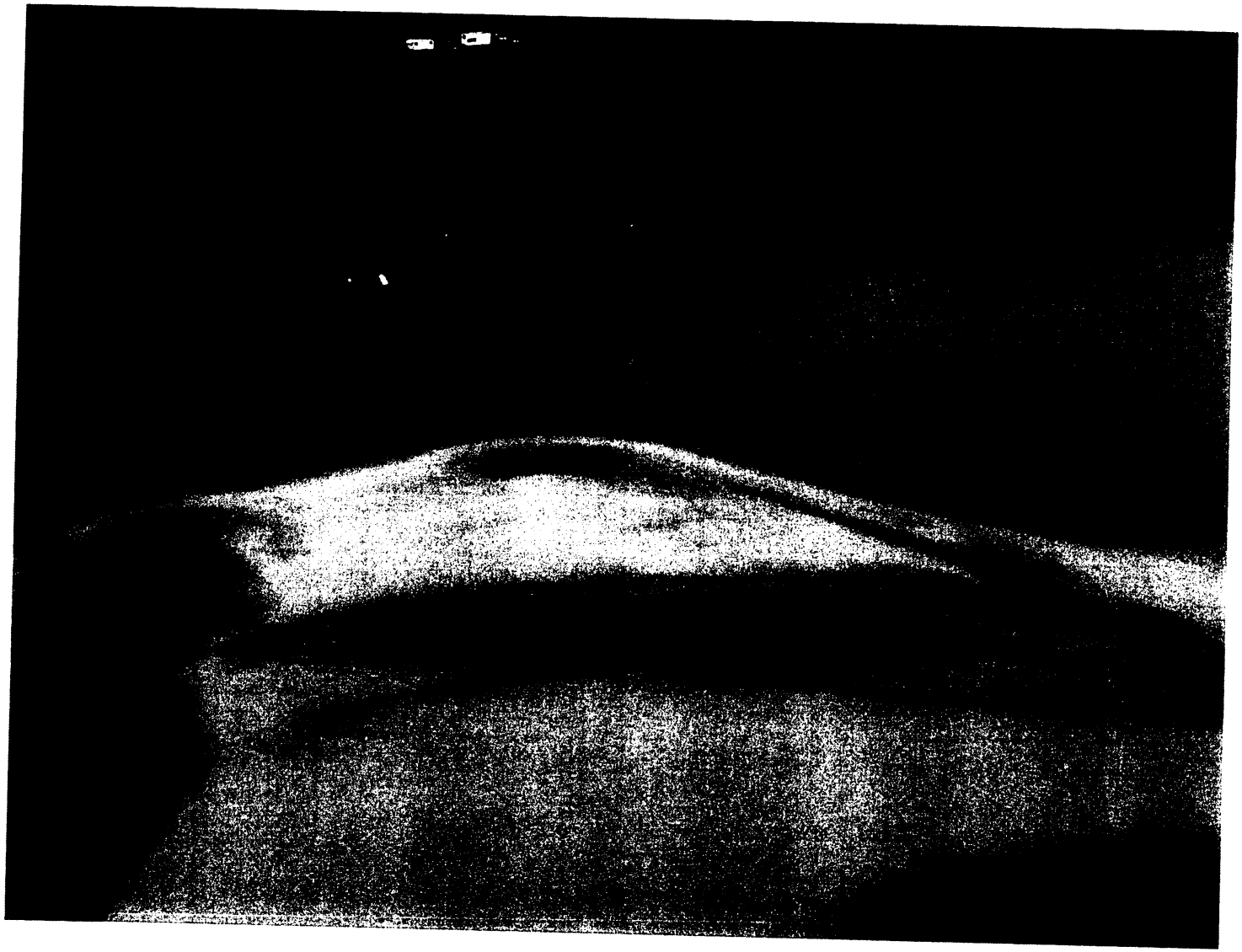
RM 31.0 — Unnamed side channel

RM 30.5 — Unnamed side channel



RM 26.0 — Unnamed side channel

RM 25.2 — Car Body Hole



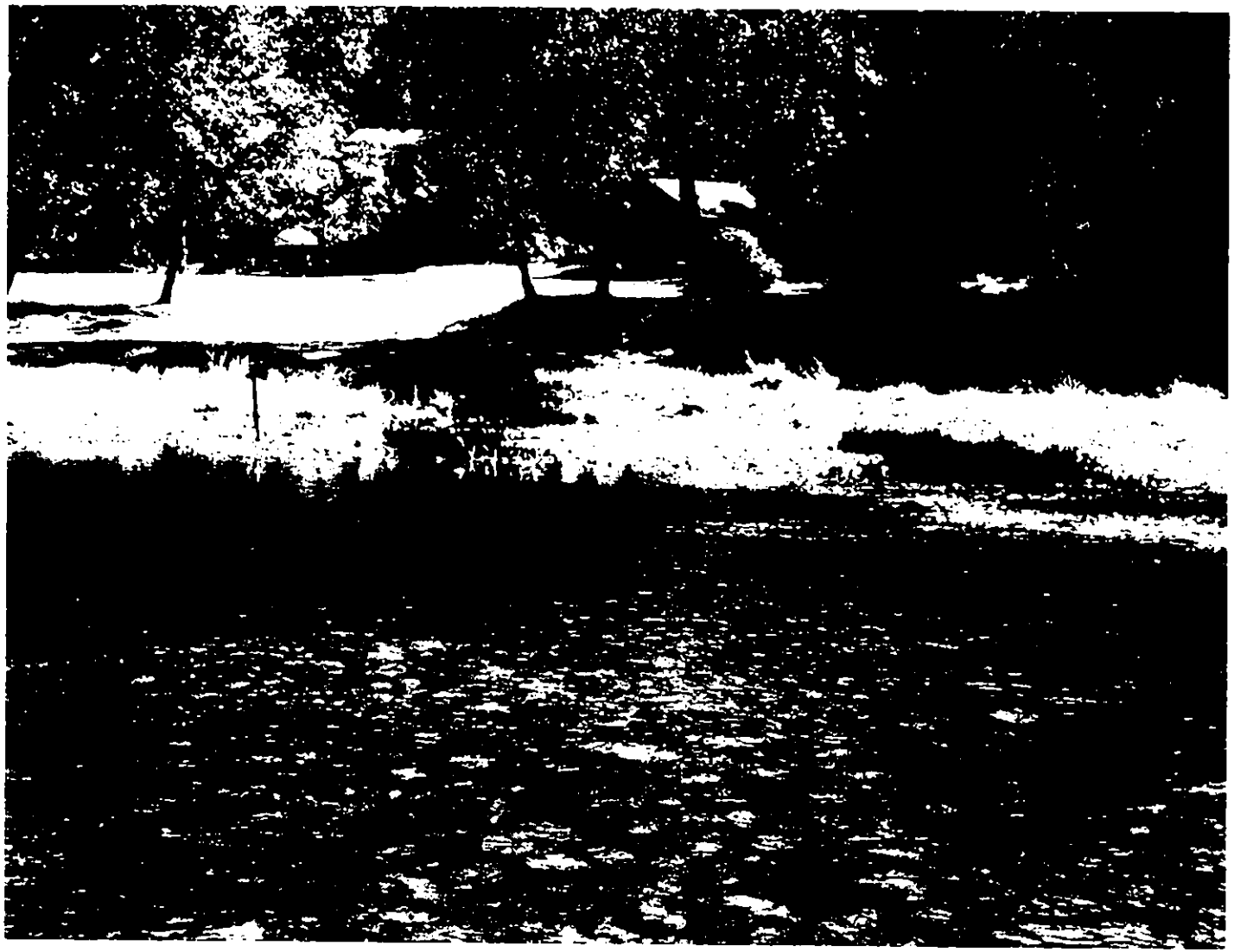
RM 20.0 — Toutle River confluence

Appendix 2.

Study Sites

Fall Chinook Spawning Monitoring

Photographs



RM 42.4 — Ken Hanson's

RM 42.5 — Otter Creek side channel

RM 47.0 — Cowlitz Timber Trails side channel

Appendix 3. Cowlitz River fall and spring Chinook carcass and redd survey data – 2002

Number of Chinook carcasses and adipose clips (n) recovered from the Cowlitz River in 2002 by race and river reach (Tables 29-32).

Table 1 Spring Chinook- Blue Creek to Barrier Dam.

Date	Fish sampled	Cwt's & or Ad	% Cwt	Scale Card I.D.
9/5	17	10	58.8	GAU 1,2,4,5,6,7,8,10,12,13
9/10	17	10	58.8	GAH 1,2,3,4,5,6,7,8,9,10
9/13	21	11	52.4	GAE 2,3,4,5,15,16 GAF 1,2,3,4,6
9/17	33	13	39.4	GAD 4,5,6,7,8,9,10,11,12,13,14 GAC 10,11
9/20	19	6	31.6	GGH 11,12,13,14,15 GGI 1
9/23	33	5	15.2	GGJ 9,10,11,12 GGK 14
9/27	40	0	0.0	
9/30	65	5	7.7	GFU 5,6 GFS 6 GGD 1,5
10/4	63	1	1.6	GGA 7
10/11	76	0	0.0	
10/14	185	4	2.2	GIC 10, GGV 10, GGU 10, GAN 7
Sub-total	569	65	11.4	

Table 2 Spring Chinook- Massey Bar to Blue Creek.

Date	Fish sampled	Cwt's & or Ad	% Cwt	Scale Card I.D.
9/10 B.C.-Toledo	2	0	0.0	
9/23	4	0	0.0	
Spring Total	575	65	11.3	

Table 3 Fall Chinook- Blue Creek to Barrier Dam.

Date	Fish sampled	Cwt's & or Ad	% Cwt	Scale Card I.D.
9/10	1	0	0.0	
9/17	4	1	25.0	GAB 1
9/20	7	0	0.0	
9/30	12	2	16.7	GGE 2,3
10/4	13	1	7.7	GFW 1
10/11	22	1	4.5	GAI 2
10/14	4	0	0.0	
10/18	435	0	0.0	
10/25	528	2	0.4	GHD 17, GHE 12
10/28	348	7	2.0	GHF 7,8,9,13 GHG 12,13,14
11/1	355	5	1.4	GHH 11,12,16,20 GHZ 14
11/4	323	3	0.9	GHX 7, GHY 11,12
11/8	244	2	0.8	GHW 4,5
11/15	256	2	0.8	GHT 2,6
11/22	131	0	0.0	
11/25	144	2	1.4	GHQ 13,14
12/2	112	0	0.0	
12/6	68	0	0.0	
12/13	31	0	0.0	
Sub-total	3038	28	0.9	

Note: Shaded area represents surveys from southern shore only.

Table 4 Fall Chinook- Massey Bar to Blue Creek.

Date	Fish sampled	Cwt's & or Ad	% Cwt	Scale Card I.D.
10/21	185	1	0.5	GHC 9
11/12	378	1	0.3	
12/8 (I5 to B.C.)	135	0	0.0	
Sub-total	698	2	0.3	
Total	3,736	30	0.8	

Chinook Spawning Surveys

Aerial surveys are conducted on the Cowlitz River to estimate spawning abundance, distribution, run timing and to monitor ESA listed natural spawning populations. Starting September 19, aerial spawning surveys were conducted about every two weeks. Number of redds observed was noted for each of five river sections from Kelso to the barrier dam.

Table 5 Chinook Redds Observed from Cowlitz River Aerial Surveys, 2002. Shaded Area of Table Compares % redds by River Section versus Year.

	Redds							% Redd	% Redd	% Redd
Date	9/17	10/1	10/15	10/30	11/14	12/5	Total	2002	2001	2000
Kelso to Castle Rock Bridge	2	1	8	34	4	30	79	1.4	1.1	0.7
Castle Rock Bridge to Toutle River Bridge	5	17	29	39	33	41	164	2.9	1.3	0.1
Toutle River Bridge to I-5 Bridge	2	19	41	38	99	115	314	5.6	2.9	2.4
I-5 Bridge to Toledo Bridge	1	23	72	63	37	72	268	4.7	4.4	2.0
Toledo Bridge to Skook Creek	6	76	71	141	157	178	629	11.1	7.2	6.9
Skook Creek to Blue Creek Boat Ramp	1	20	168	149	127	204	669	11.9	8.4	2.4
Blue Creek Boat Ramp to Mill Creek	33	223	529	755	799	486	2825	50.1	40.9	59.8
Mill Creek to Barrier Dam	60	83	201	128*	130*	93	695	12.3	33.9	25.8
Total	**110**	**462**	**1119**	**1347**	**1386**	**1219**	**5643**	**100**	**100.**	**100.**

* 66% Redds not visible due to high flows and turbidity.

Appendix 4. Letter report to the Cowlitz Fisheries Technical Committee, October 2, 2003

TACOMA POWER

3628 South 35th Street
Tacoma, Washington 98409-3192

TACOMA PUBLIC UTILITIES

October 2, 2003

Craig Burley
Washington Department of Fish and Wildlife
2108 Grand Blvd.
Vancouver, WA 98661-4624

Ric Abbett
Washington Council, Trout Unlimited
2401 Bristol Court, A-18
Olympia, WA 98502

Brad Caldwell
Washington Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600

Gene Stagner
U. S. Fish and Wildlife Service
510 Desmond Drive SE, Suite 102
Lacey, WA 98503-1273

Michelle Day
NOAA Fisheries
Hydropower Division
525 NE Oregon Street, Suite 500
Portland, OR 97232

Clifford Casseseka
Yakama Nation
Fisheries Resources Management
P.O. Box 151
Toppenish, WA 98948

RE: Cowlitz Project (FERC No. 2016), Article 13, Instream Flows,

Cowlitz Fisheries Technical Committee members:

The enclosed information is in regard to the side channel spawning survey and redd enumeration requirements of Article 13 (c). The article required spawning surveys, after certain flow conditions, in *"...key side-channel areas at River Mile 42 and River Mile 47.5.."*. A review of a U.S. Army Corps of Engineers Cowlitz River mile map created from aerial photographs reveals the two side-channels are actually at River 42.5 and RM 47. The enclosed maps and aerial photos detail the locations.

This information is being provided for your review in advance of the next FTC meeting. The next scheduled meeting of the FTC is at 10:00 AM on October 14, 2003 at the Cowlitz Hydroelectric Project, Mayfield office in Silver Creek, Washington.

If you have any questions feel free to contact me at (253) 502-8767 or at mlarivie@cityoftacoma.org.

Sincerely,

Mark G. LaRiviere
Senior Fisheries Biologist
Natural Resources

Enclosure

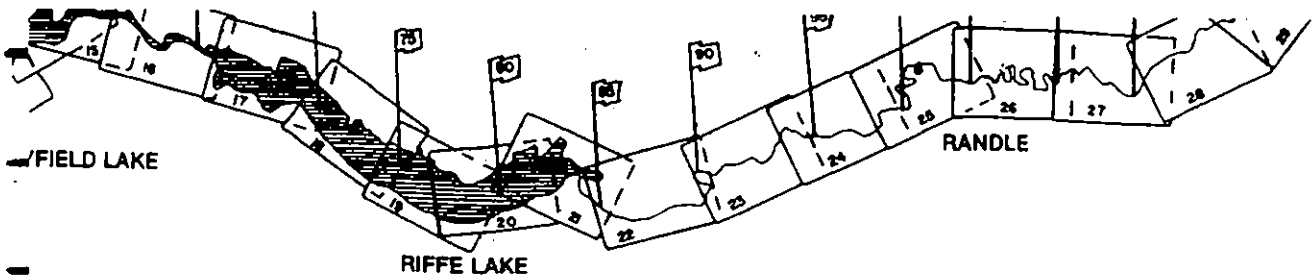
cc: D. Young
Wolf Dammers

Table 2.6-16. Side channel location and recommendations for maintaining or enhancing fish rearing habitat.

Side Channel	Recommended Action	Comment
RM 49	No action	Inflow cut off by gravel accumulation below Barrier dam; hydrologic connection through backwater inflow
RM 47	Protect from development; enhance with LWD; provide flows greater than 2,140 and less than 5,000 cfs	Important chinook spawning habitat
RM 45.3	Protect from development	Former meander; inflow and outflow apparent at 2,850 cfs
RM 45	No action	Backwater refuge at point bar tail
RM 43.5	Protect and maintain (Tacoma ownership); discourage use of recreational vehicles	Two wetland ponds near Brim Road; recreational vehicle use observed on vegetating gravel bar just upstream
RM 43	Protect from development; enhance with LWD; provide flows greater than 2,140 and less than 5,000 cfs	Important chinook spawning habitat
RM 42	Consider reconnecting ponds to side channel flow; provide flows greater than 2,140 and less than 5,000 cfs	Stagnate ponds with high rearing habitat potential near side channel; inflow not connected except at high flows
RM 39.7	No action	Historic meander bend; inflow cut off; good backwater inflow
RM 38-40	Protect from development and consider enhancement to reconnect backwater inflow; enhance with LWD	Historic meander bend and side channel presently subject to clearing and road building; outflow has shallow connection to potential rearing habitat
RM 37.5	No action	Historic meander bend; inflow cut off; some high flow recharge and backwater inflow; difficult to maintain enhancement
RM 36.7	No action	
RM 35.5	Protect from development and livestock	No inflow surface connection; good backwater connection and some tributary inflow; livestock grazing concerns
RM 33	Protect from development; enhance with LWD; provide flows greater than 2,140 and less than 5,000 cfs	Potential spawning habitat
RM 32	Protect from development; enhance with LWD; provide flows greater than 2,140 and less than 5,000 cfs	Good spawning and rearing habitat
RM 31.5	Protect from development; improve backwater inflow	Former meander bend is well vegetated; side channel inflow at high flow; consider improving outflow by removing silt accumulations
RM 30.5L	No action	Wide, shallow habitat with little available cover during study flows
RM 30.5R	Maintain inflow connectivity; protect from development; provide flows greater than 2,140 and less than 5,000 cfs	Deep pools and good shading, excellent rearing habitat
RM 27.7	Protect from development; provide flows greater than 2,140 and less than 5,000 cfs	Good shading, excellent rearing habitat
RM 24	Improve backwater inflow; protect from development	Old railroad grade berm
RM 23	No action	High recreation use with vehicles on gravel bar

COWLITZ RIVER, WASHINGTON

MOUTH TO PACKWOOD IN 31 SHEETS



SHEETS PREPARED AT 1" = 1,000' FROM AERIAL PHOTOGRAPHY FLOWN 13 OCTOBER 1978 AT SCALE 1:48,000. PLACE NAMES AND OTHER MAP INFORMATION COMPILED FROM U.S. GEOLOGICAL SURVEY TOPOGRAPHIC AND ORTHOGRAPHIC QUADRANGLES; WASHINGTON DEPARTMENT OF NATURAL RESOURCES ORTHOPHOTO MAPS; AND LEWIS AND COWLITZ COUNTY MAPS. SECTION LINES ARE APPROXIMATE AND SHOULD BE USED AS A GUIDE FOR LOCATION ONLY.

PREPARED BY: PHOTOGRAMMETRY SECTION, SURVEY BRANCH
U.S. ARMY ENGINEER DISTRICT, PORTLAND
P.O. BOX 2946
PORTLAND, OREGON 97208
MAY 1979

(Evelyn Krebs) 221-6901 (Portland)
Florence 221-6475

COVER PHOTOGRAPH: COWLITZ SALMON HATCHERY. COURTESY OF BUD KIMBALL COLLECTION AT WASHINGTON STATE UNIVERSITY.

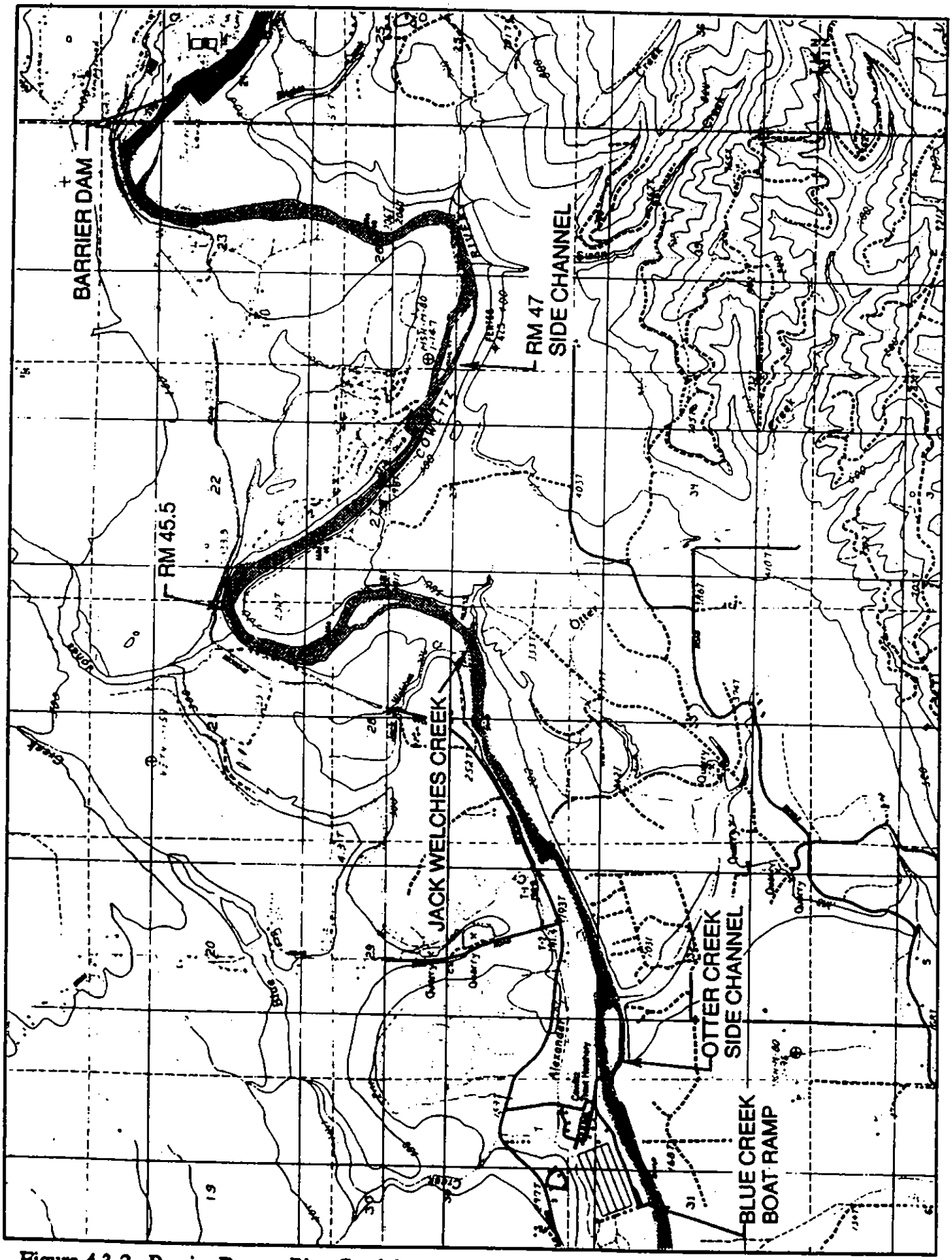


Figure 4.3-2. Barrier Dam to Blue Creek boat ramp.

LARGE-FORMAT IMAGES

One or more large-format images (over 8 ½" X 11") go here.
These images are available in FERRIS at:

For Large-Format(s):
Accession No.: 20040721-0307

Security/Availability:

- ☑ PUBLIC
- ☐ NIP
- ☐ CEII
- ☐ NON-PUBLIC/PRIVILEGED

File Date: 7-19-04 Docket No.: P-2016

Parent Accession No.: 20040721-0305

Set No.: 1 of 1

Number of page(s) in set: 2

TRP-G REV- 4/2003 (yellow)

Appendix 5. October 14, 2003 FTC meeting summary

Cowlitz Hydroelectric Project
FERC NO. 2016
Fisheries Technical Committee

FINALIZED MEETING SUMMARY

Date: Oct. 14, 2003 – 10:00 AM to 12:45 PM

Location: Cowlitz River Project Mayfield Office, Silver Creek, Washington

Attendees:

FTC members:

Mark LaRiviere	Tacoma Power
Jim Tuggle	Trout Unlimited/Conservation Caucus

Others:

Tom Martin, Tacoma Power

Wolf Dammers, WDFW

Chuck Johnson, WDFW

Jim Pacheco, WDOE

Lars Mobrand & Kevin Malone, Mobrand Biometrics

Agenda Changes

Deferred discussion about FishPro, Inc., hatchery design consultants, under Old Business until the next meeting due to lack of member quorum.

Approval of Sept 2, 2003 meeting summary

Approval of the previous meeting summary was deferred due to lack of a member's quorum.

Jim Tuggle, Trout Unlimited announced he would be the new Conservation Caucus representative and shared his background and experience with the group.

Old Business

FERC License, Cowlitz Water Quality Certification status and Cowlitz Tribe, FOC, et al lawsuit in the 9th Circuit Court of Appeals

Tom and Mark updated the group and reviewed FERC's action confirming the issuance and effective date of July 18, 2003 for the Cowlitz Project (FERC No. 2016) license. The appeal of the Water Quality Certification Order is scheduled to be heard in April 2004. The group was apprised of the lawsuit that the Cowlitz Tribe, Friends of the Cowlitz and CPR-Fish filed with the U.S. 9th Circuit Court of Appeals against FERC, NMFS and the U.S. Army Corps of Engineers. After a discussion that one of the main issues was the lack of a biological opinion (BiOp), Mark commented that NOAA Fisheries' goal was to have a draft of the BiOp completed in December 2003.

Fish Hatchery Management Plan

Kevin Malone of Mobrand Biometrics Inc. gave a presentation about the Fish Hatchery Management Plan (FHMP). Kevin discussed the license article that required this plan – Settlement Agreement License Article 6. He noted that the plan emphasizes fish quality over fish quantity and that the FHMP is consistent with wild fish recovery. He also noted that this document is a license requirement and that Tacoma Power will submit the plan to FERC on schedule.

Kevin's presentation went on to cover all of the salient points of the 50% Working Draft of the FHMP, which are follows:

- Downstream Fish Passage

- 75% to 95% fish passage survival (FPS) for upper basin
- 95% FPS at Mayfield Dam

- Hatchery production
  - upper basin adult restoration needs
  - lower Cowlitz River harvest needs
- Credit Mechanisms
  - Hatchery production reduced as naturally produced smolts outmigrate
- Harvest
  - Wild fish protection
  - Maintaining lower river recreational fishery
- Habitat
  - Upstream needs
  - Downstream emphasis on side channels
- Monitoring and Evaluation
  - Adaptive Management
  - Monitor all stocks upstream of Toutle River

Lars Mobrand gave a presentation on the Population Change Criteria (PCC) model for determining the abundance values in the upper basin for spring Chinook salmon and steelhead trout. He explained what parameters were used and that the model sets a goal of population growth over time. The recruit per spawner (R/S) model measures abundance from parent to progeny, while the PCC model measures abundance from year to year. He noted that WDFW proposed the use of the PCC model and that it originated from Paul McElhany (NOAA Fisheries) of the Willamette/Lower Columbia Technical Recovery Team.

Kevin noted that NOAA Fisheries and the USF&WS are charged with setting the abundance levels for self-sustaining populations. Chuck noted that these agencies would collaborate with WDFW in doing so.

Lars noted that to determine the "true" smolt to adult ratio, the naturally spawning population needs to be let loose in the upper basin. Currently the spawning populations are a mix of naturally produced and hatchery produced fish. The naturally spawning population in the upper basin needs to develop, and then we can measure the population parameters for the two models. For the R/S model the goal is a naturally produced adult return ratio greater than one-to-one in three of five years. For the PCC model, the goal is an approximate 12% annual population increase of naturally produced adults. He noted that the PCC model indicates that unless the spring Chinook smolt-to-adult ratio reaches 30 at the Barrier Dam population sustainability would not be obtained. The first time the smolt-to-adult ratio of 30 is reached, planting of hatchery adults should be discontinued and the population monitored thereafter.

Lars also noted that for spring Chinook to meet the minimum PCC model requirements for a self-sustaining population, improvements in both the fish passage survival rate (FPS) and habitat are necessary. The critical (limiting) habitat issues were briefly discussed. These include elevated river temperatures in the main stem Cowlitz River, a lack of wood in the main stem and tributary habitat quality in both the Cowlitz and Cispus sub-basins.

For steelhead, Lars stated that the PCC model shows that a smolt-to-adult ratio of 20 and a 75% FPS would yield a sustainable population. Mark commented that we are currently near the 75% rate. More discussion of the model by the group ensued and test periods were defined.

Mark brought forward the idea of not planting hatchery spring Chinook fingerlings in the upper basin in 2004 to allow the naturally produced population to establish sooner. The initial draft of the plan for Upstream Fish Passage (Settlement Agreement License Article 3) will include a table identifying when hatchery juvenile plants in the upper basin would end in order to ensure that the abundance of naturally produced adults could be measured within the initial 15 year time frame of the Cowlitz license.

Wolf said that WDFW has not thoroughly reviewed the draft FHMP and they have not returned comments to Tacoma as of yet. Additional Tacoma and WDFW discussions are needed. As most people attending this meeting were not familiar with the draft FHMP, and the FTC members had requested this presentation from Mobrand Biometrics, Mark offered to arrange for this presentation to be repeated at the next FTC meeting.

Mark noted the FHMP review schedule and pointed out that FTC comments for the initial review are due on November 25th. He urged members to submit written comments to Tacoma that could be responded to. Kevin stated that if any of the groups had any major concerns with the draft FHMP he would need to know of these before November 25th due to the holiday schedule.

Discussion of Article 3, Upstream Fish Passage: Barrier, Mayfield and Mossyrock

The decision tree/flow chart for Article 3 was distributed to the group with a request for comments back to Tacoma. Tom explained how it was developed and use of references within the flow chart. An updated version of this flow chart will be included in the FTC review draft of the Article 3 compliance plan due to the FTC by November 14, 2003.

Review of FTC Tasks

Mark distributed the updated table that contained the 2003/2004 plan review tasks and review dates for the FTC. Mark briefly discussed each of the eight tasks listed.

Instream Flow Studies

Mark discussed the monitoring sites for fall Chinook spawning listed in Settlement Agreement License Article 13. He indicated that, as briefly discussed in the last meeting, there was an error with the sites as listed in the license article. Mark proposed to change them, as allowed by the article, and pointed out that the information on the corrected monitoring sites was mailed to the FTC on October 2, 2003. He requested the FTC approve the proposed change in monitoring sites.

Wolf raised the issue of fluctuation flows on the weekend that hazed fish out of spawning areas. Mark noted that this possibility was discussed in the relicensing instream flow sub-committee meetings and it would only affect stream margin spawning areas. In some fall Chinook streams in Washington state flow regimes are set to specifically discourage stream margin spawning. On the Cowlitz the redds in the margin areas would not be dewatered, but some adults may be displaced.

Wrap up, confirm next meeting date

The next meeting was scheduled for 1 PM on November 4th in Lacey, Washington at the USF&WS office. Mark will confirm the meeting location and notify the FTC. The December 2nd meeting is scheduled for 10 AM at the WDFW, Vancouver office.

Meeting adjournment

This meeting was adjourned at 12:45 PM.