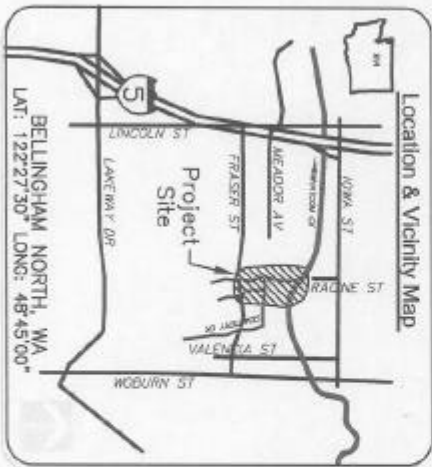


**PROJECT PURPOSES/USES**

- ~ ENHANCE AVAILABLE REARING AND SEASONAL REFUGE HABITATS TO ONE OF THE PRIMARY SALMONID SPawning AREAS IN WHATCOM CREEK
- ~ IMPROVE HABITAT CONDITIONS PRIMARILY FOR CUTTHROAT TROUT, WITH ADDITIONAL BENEFITS FOR COHO SALMON AND OTHER WATNE FISH SPECIES SALMON PARK
- ~ CREATE HIGH-FLOW FISH REFUGE AND REARING HABITAT ALONG WHATCOM CREEK
- ~ STREAMSIDE BERMS TO BE REMOVED AND THE STREAM BANKS MODIFIED TO RESTORE CHANNEL MIGRATION RATES, INCREASE FLOODPLAIN AREA, IMPROVE FLOOD STORAGE CAPACITY, AND FACILITATE NATURAL GENERATION OF SALMONID HABITAT
- ~ CEMETERY CREEK
- ~ CREATE A NEW STREAM CHANNEL AND THREE COLD WATER FISH REARING PONDS IN LOWER CEMETERY CREEK
- ~ IMPROVE THERMAL REFUGE HABITAT DURING PERIODS OF ELEVATED STREAM TEMPERATURES IN WHATCOM CREEK (SUMMERTIME)
- ~ PLACE LARGE WOODY DEBRIS IN PORTIONS OF CEMETERY CREEK AND WHATCOM CREEK TO IMPROVE HABITAT DIVERSITY AND COVER
- ~ CREATE MORE NATURALLY FUNCTIONING STREAM CORRIDORS



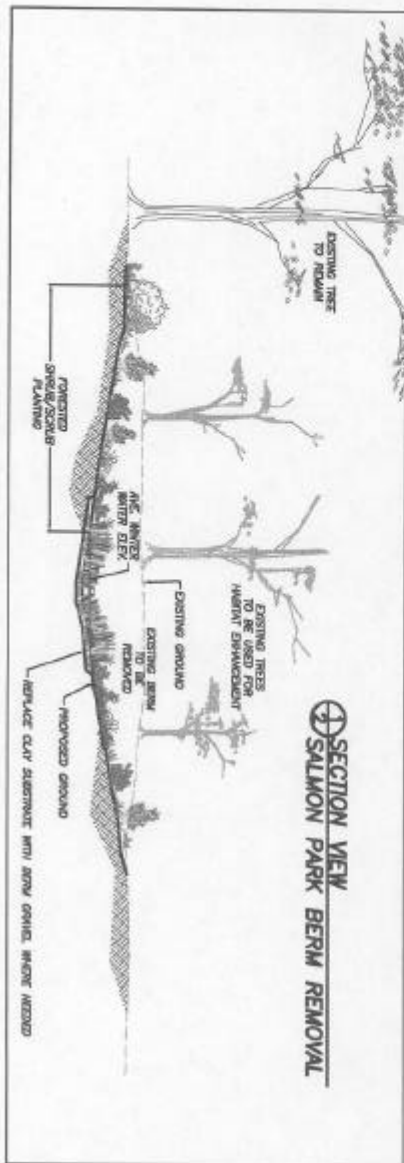
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SR	SR
DATE: 02	DATE: 02/01
NO: 11-35-01	

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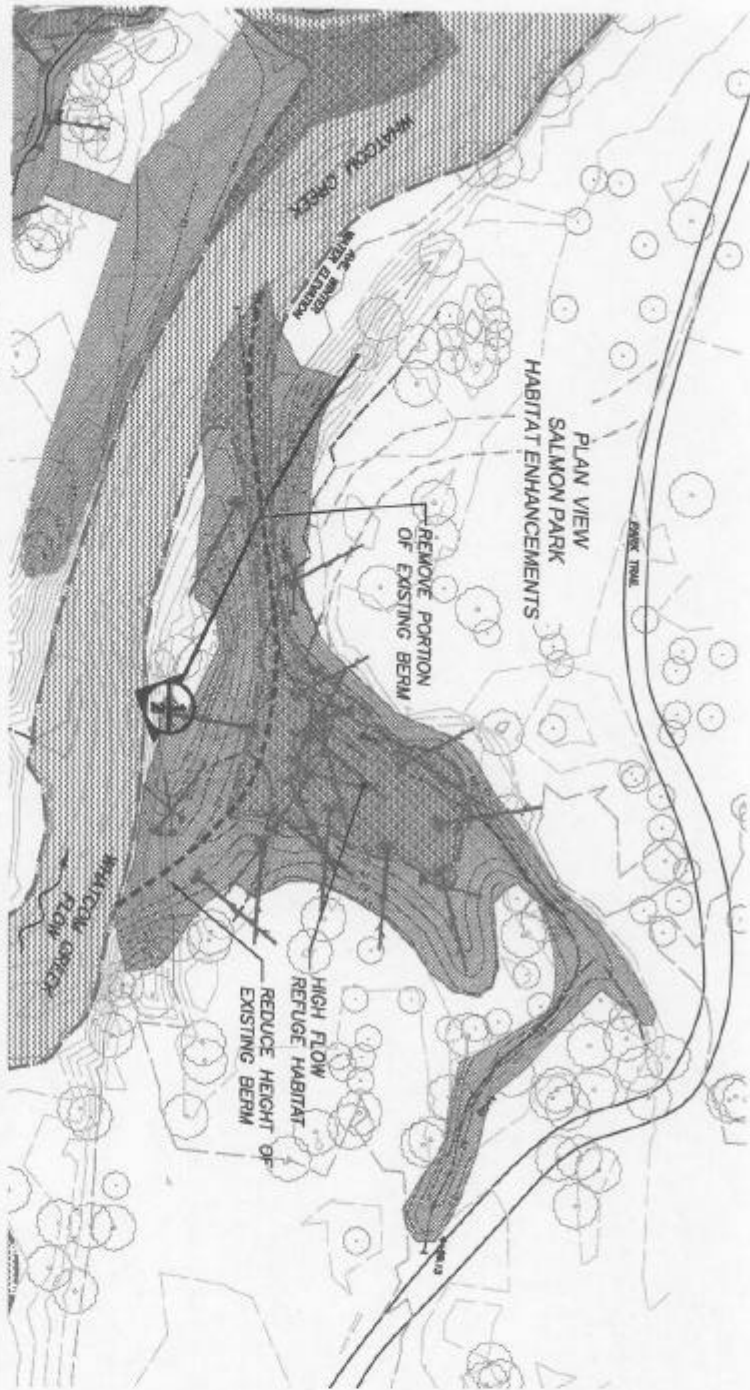
**WHATCOM CREEK LONG TERM ENHANCEMENT PLANS FOR SALMONID HABITAT**

**Aerial View Enhancement Areas**





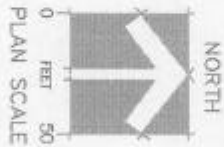
SECTION VIEW  
SALMON PARK BERM REMOVAL



PLAN VIEW  
SALMON PARK  
HABITAT ENHANCEMENTS



PLAN LEGEND



0 25 50  
FEET  
PLAN SCALE

Preliminary  
-Not for Construction-



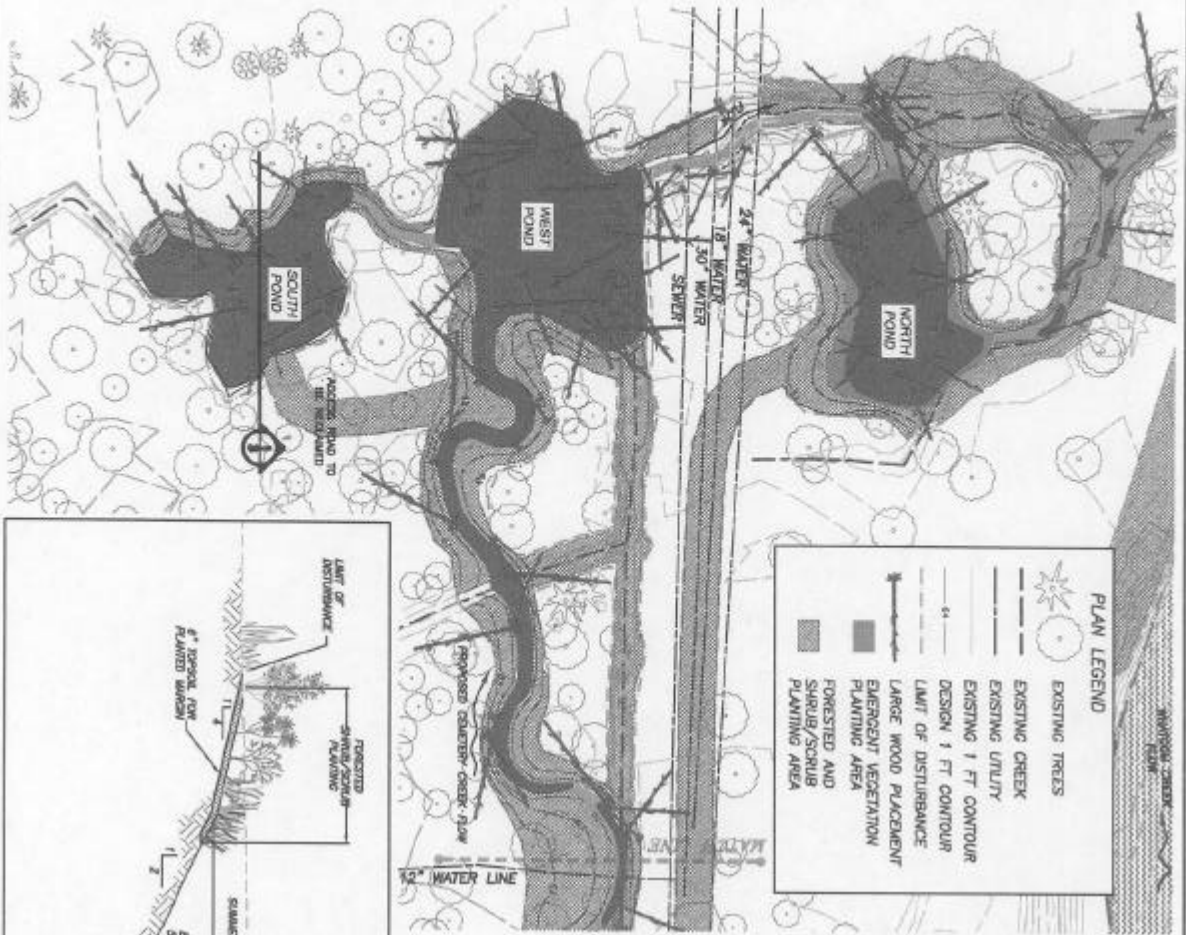
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WHATCOM CREEK LONG TERM  
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SALMONID HABITAT

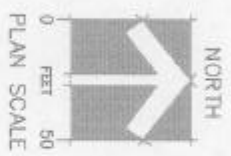
PROJECT NO: 00-02-23

SALMON PARK  
PLAN VIEW  
HABITAT ENHANCEMENT

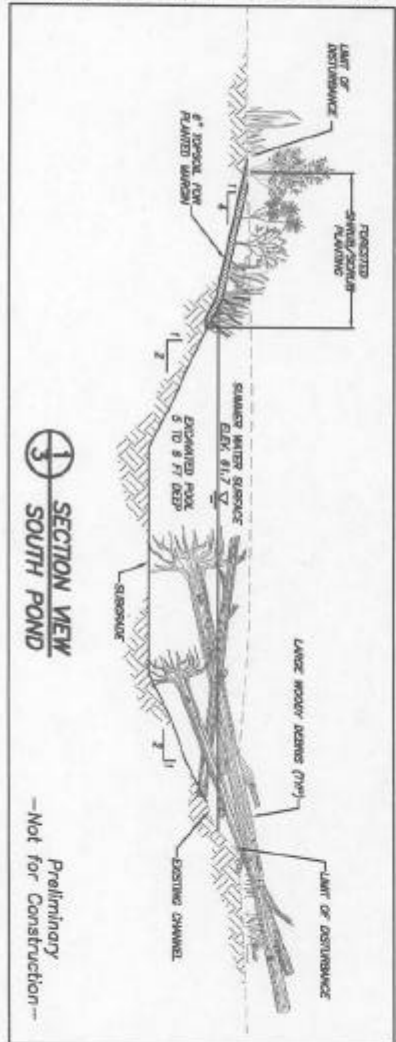
DESIGNED BY MM	CHECKED BY LM
DATE NS	DATE DWN 11-00-01



**PLAN VIEW  
CEMETERY CREEK  
HABITAT ENHANCEMENTS**



- SALMONID HABITAT FEATURES**
- ~ CREATION OF A MORE NATURALLY FUNCTIONING STREAM CORRIDOR AND THREE COLD-WATER FISH REARING PONDS IN LOWER CEMETERY CREEK
  - ~ PROVIDES ADDITIONAL THERMAL REFUGE HABITAT DURING PERIODS OF ELEVATED WATER TEMPERATURES IN WHATCOM CREEK (SUMMERTIME)
  - ~ NEAR STREAM VEGETATION PROVIDES SHADE AND FOOD CHAIN SUPPORT
  - ~ LARGE WOOD PLACEMENTS FOR COVER, REFUGE, AND HABITAT DIVERSITY
  - ~ ENLARGED CAPACITY FOR NATIVE SALMONIDS



**SECTION VIEW  
SOUTH POND**

Preliminary  
—Not for Construction—

**PREFERRED DESIGN ALTERNATIVE**

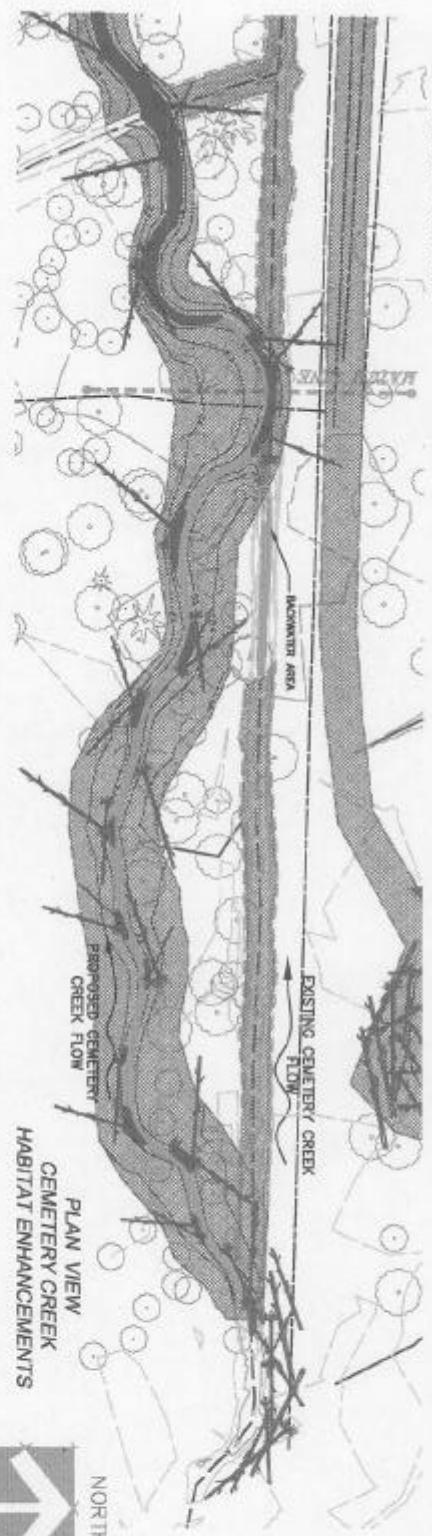
**WHATCOM CREEK LONG TERM  
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PROJECT NO: 00-02-23

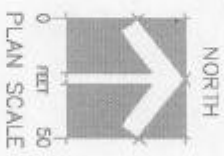
**Cemetery Creek  
Plan View  
Habitat Plan West**

DESIGNED BY	CHECKED BY
MM	LM
DRAWN BY	DATE PLOTTED
NS	11-30-01

Preliminary  
 -Not for Construction-



PLAN VIEW  
 CEMETERY CREEK  
 HABITAT ENHANCEMENTS



- CEMETERY CREEK HABITAT FEATURES**
- ~ CREATION OF A MORE NATURALLY FUNCTIONING STREAM CORRIDOR
  - ~ LARGE WOOD PLACEMENTS FOR COVER AND HABITAT DIVERSITY
  - ~ BANK VEGETATION PROVIDES FOOD CHAIN SUPPORT, BANK STABILITY AND SHADE
  - ~ EXISTING OVERHANGING TREES PROVIDE SHADE AND KEEP WATER TEMPERATURES LOW
  - ~ IMPROVED NATURAL STREAM FUNCTION AND RIPARIAN INTERACTION
  - ~ ENLARGED CAPACITY FOR CUTTHROAT TROUT

**PREFERRED DESIGN ALTERNATIVE**

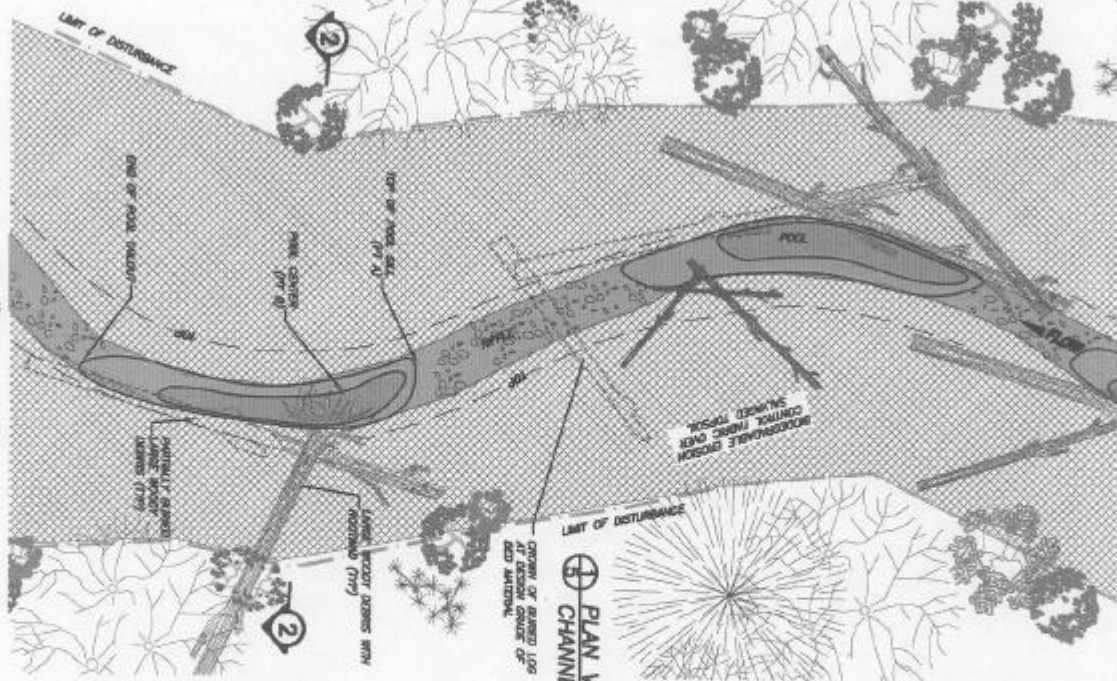
**WHATCOM CREEK LONG TERM  
 ENHANCEMENT PLANS FOR  
 SALMONID HABITAT**

PROJECT NO: 00-02-23

**CEMETERY CREEK  
 PLAN VIEW  
 HABITAT PLAN EAST**

DESIGNED BY	MM	DRAWN BY	LM
CHECKED BY	NS	DATE PLOTTED	11-30-01





**TYPICAL SECTION VIEW POOL**



**PREFERRED DESIGN ALTERNATIVE**

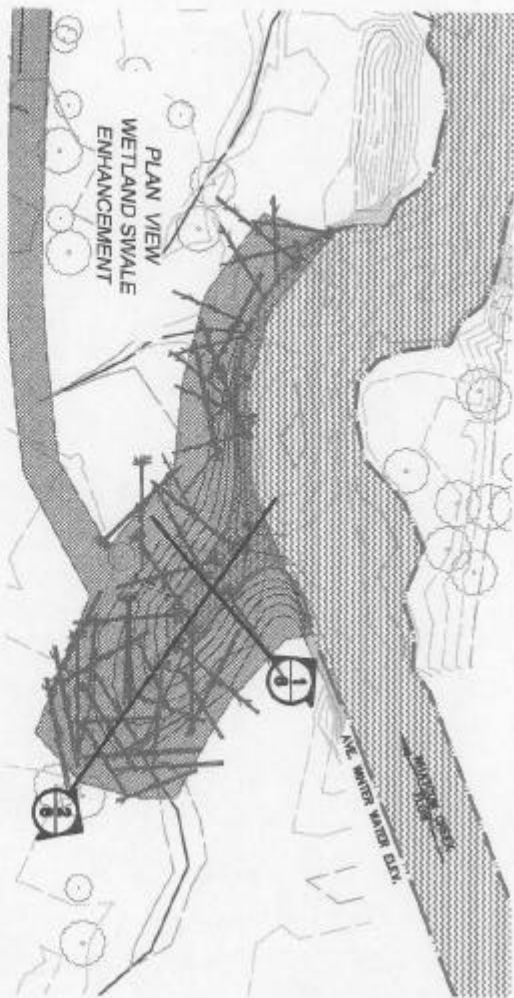
**WHATCOM CREEK LONG TERM ENHANCEMENT PLANS FOR SALMONID HABITAT**

PROJECT NO: 00-02-23



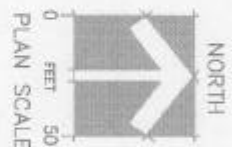
DESIGNED BY	MM	LM
DRAWN BY	NS	NS
CHECKED BY	NS	NS
DATE	11-30-01	

**CEMETERY CREEK TYPICAL CHANNEL DETAILS**



**PLAN LEGEND**

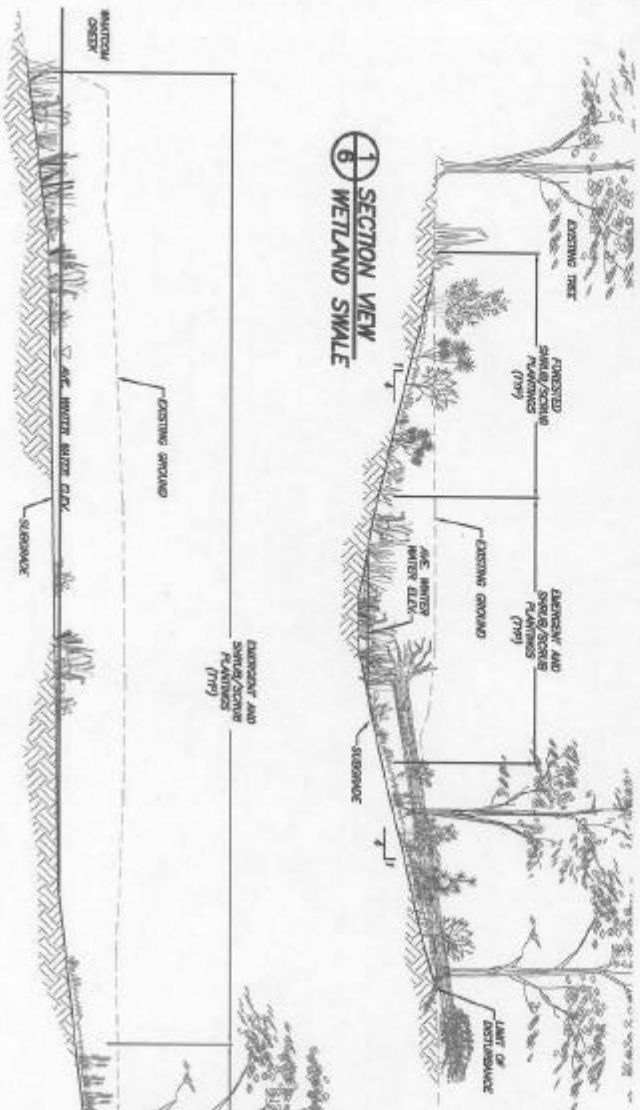
	EXISTING TREES
	EXISTING CREEK
	EXISTING UTILITY
	EXISTING 1 FT CONTOUR
	DESIGN 1 FT CONTOUR
	LIMIT OF DISTURBANCE
	LARGE WOOD PLACEMENT
	FORESTED AND SHRUB/SCRUB PLANTING AREA



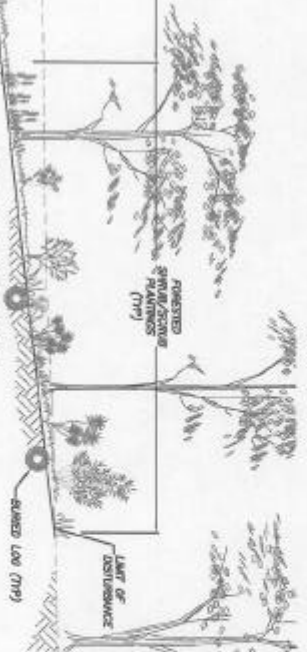
**HABITAT ENHANCEMENT AREA FEATURES**

- ~ CREATION OF HIGH-FLOW FISH REFUGE HABITAT
- ~ TRANSITION VEGETATION PROVIDES SHADE AND FOOD CHAIN SUPPORT
- ~ ENHANCED WETLAND AREA ALONG WHATCOM CREEK

**1 SECTION VIEW WETLAND SWALE**



**2 PROFILE VIEW WETLAND SWALE**



**PREFERRED DESIGN ALTERNATIVE**

**WHATCOM CREEK LONG TERM ENHANCEMENT PLANS FOR SALMONID HABITAT**

PROJECT NO: 00-02-23

**Cemetery Creek Plan View Wetland Swale Enhancement**

DESIGNED BY	LM
DRAWN BY	NS
DATE	11-30-01



# 11.0 Figures and Photographs

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Figure 1, 30-32, 35-40 – NOAA<sup>43</sup>

Figure 4-9 – City of Bellingham

Figure 15 – Ashbrook, WDFW

Figure 16 – Davis, WDOE

Figure 19, 20 – Inter-Fluve, Inc.

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Figure 25 – Loof, WDFW

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<sup>43</sup> Background photograph in Figure 32, 37-40 courtesy of Walker and Associates, Seattle Washington. Copyright 1999

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## 11.0 Figures and Photographs



**Figure 1: Incident Location**



**Figure 2: Break Site**



**Figure 3: Excavation of Pipe**

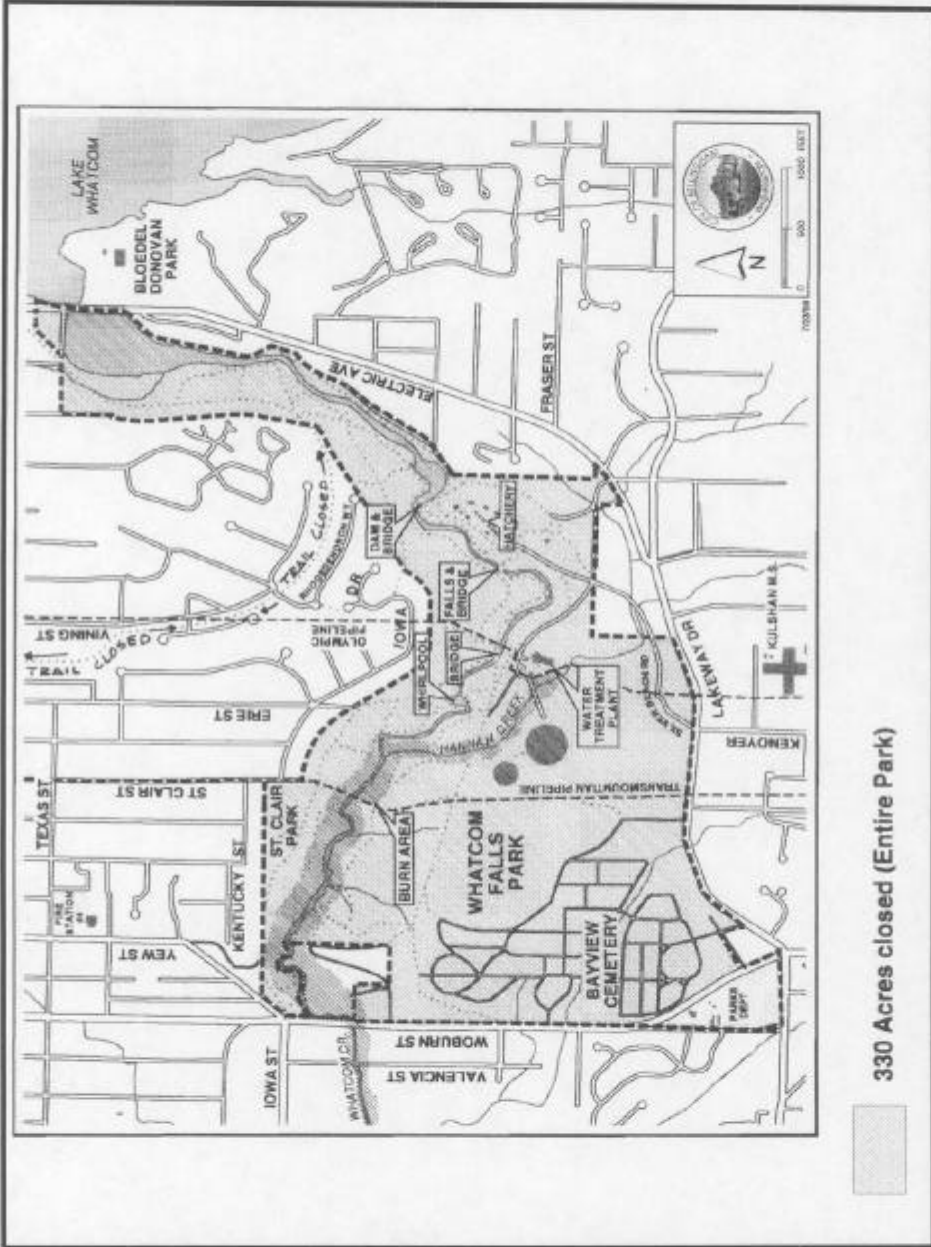


Figure 4: Map of Whatcom Falls Park Area. Closures from June 10-17, 1999

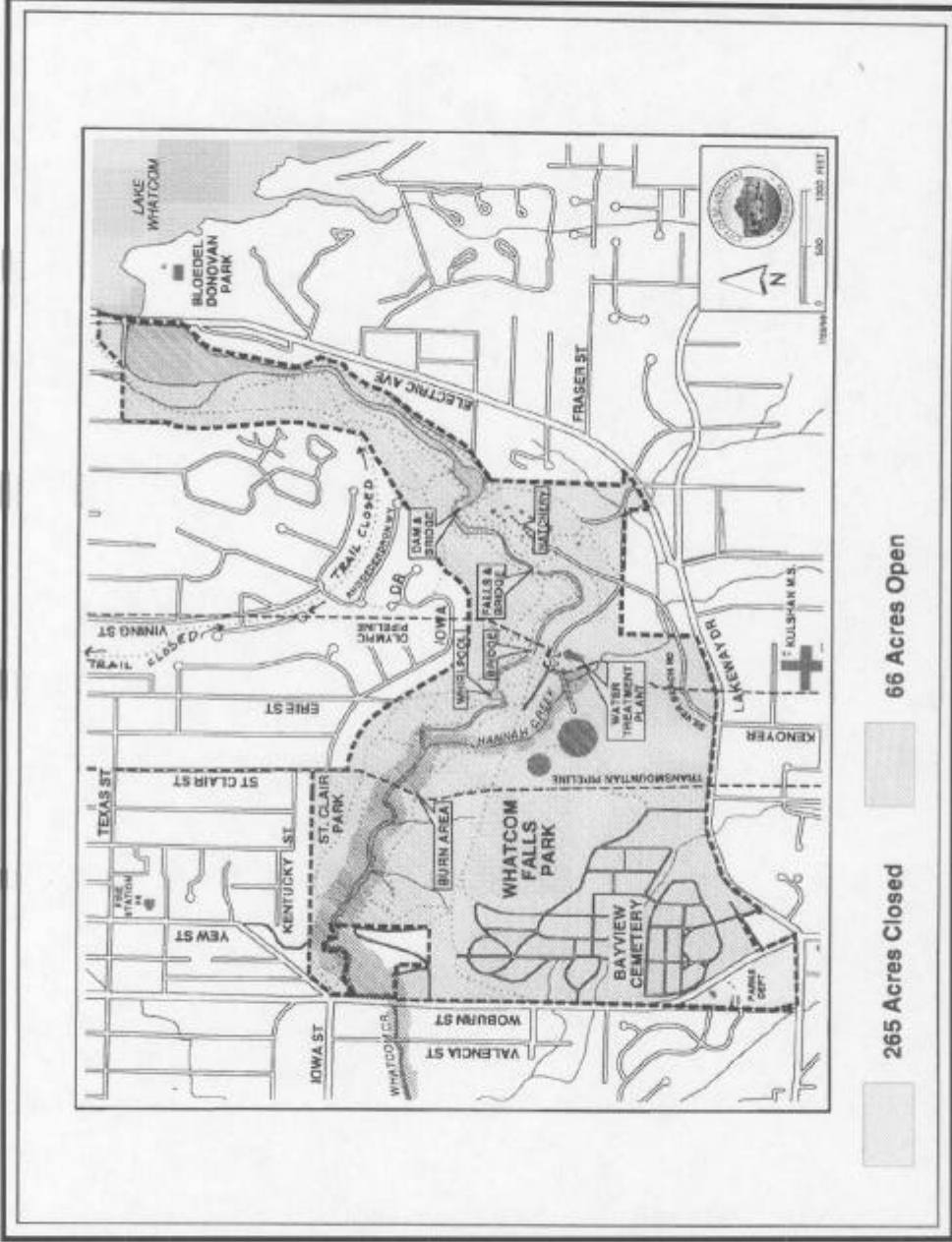


Figure 5: Map of Whatcom Falls Park. Closures from June 17-July 10, 1999

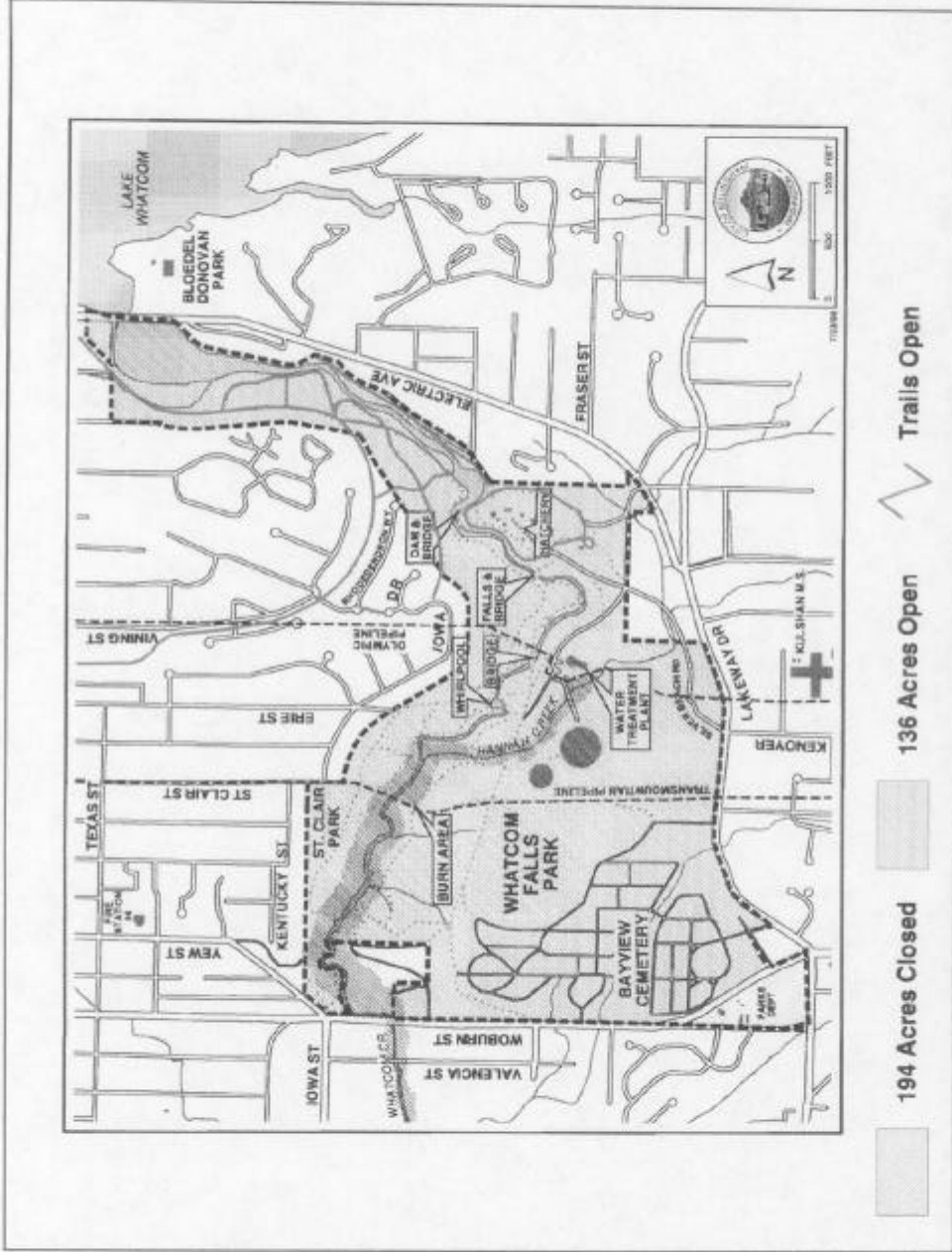


Figure 6: Map of Whatcom Falls Park. Closures from July 10-15, 1999

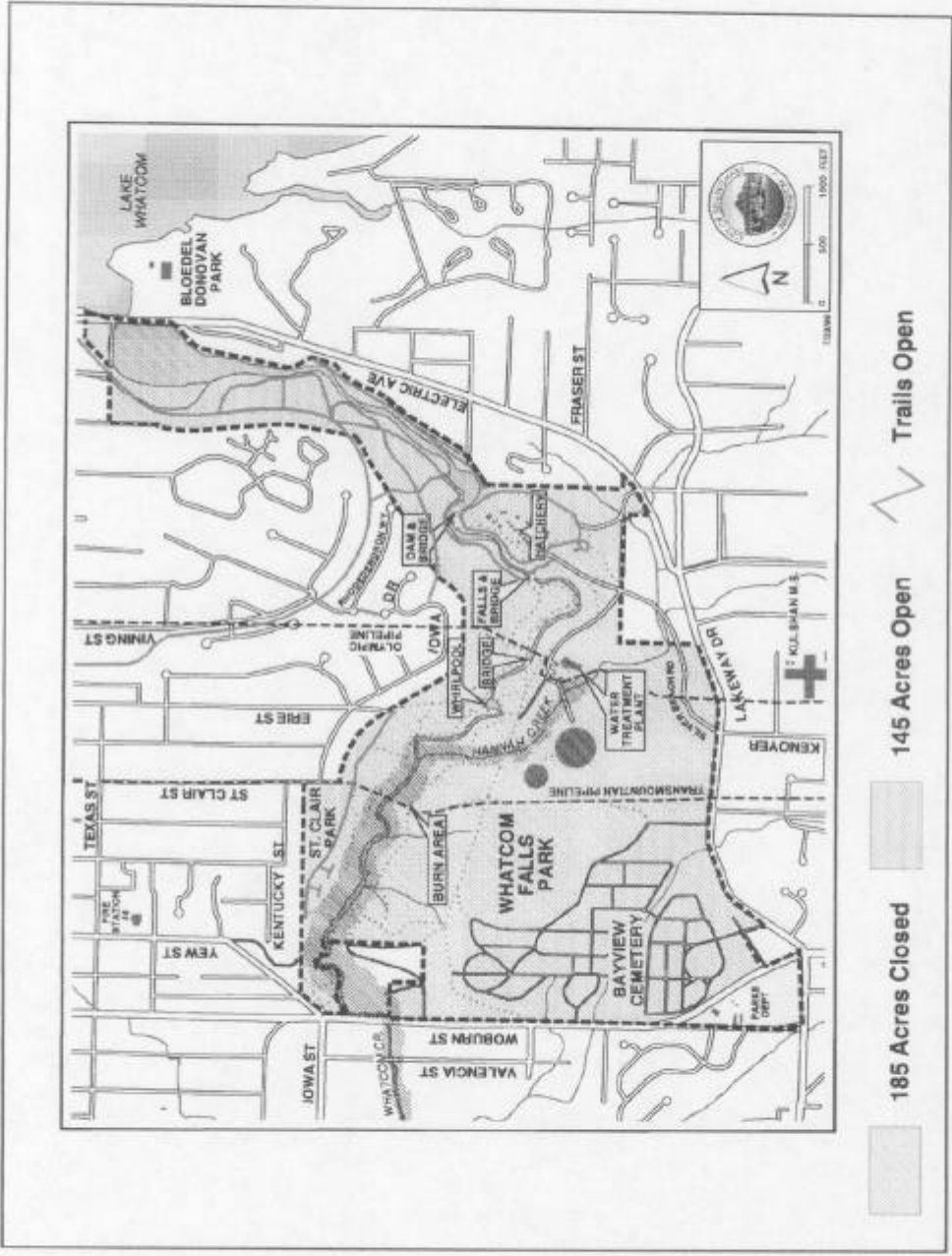


Figure 7: Map of Whatcom Falls Park. Closures from July 16-23, 1999

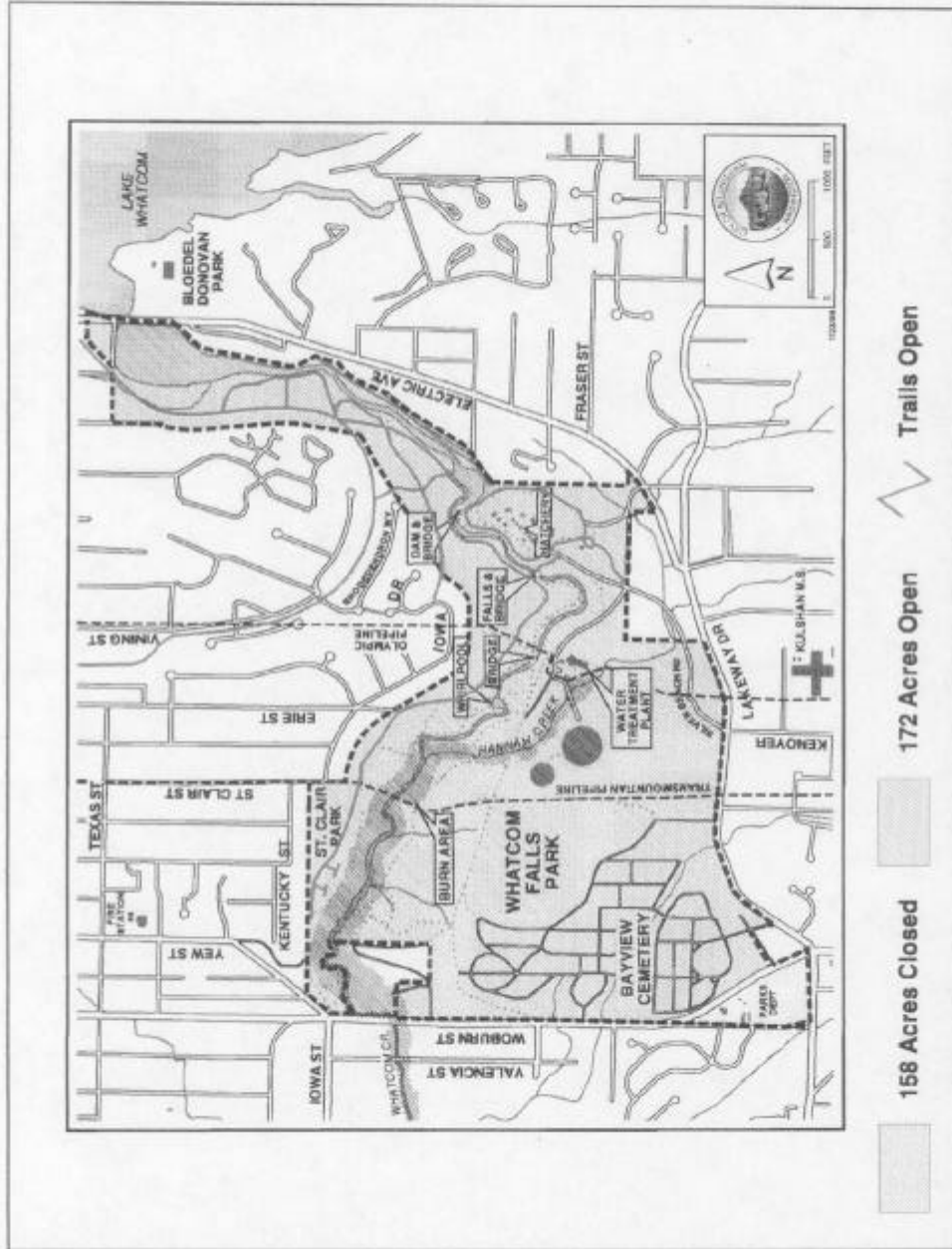


Figure 8: Map of Whatcom Falls Park. Closures from July 23-September 22, 1999

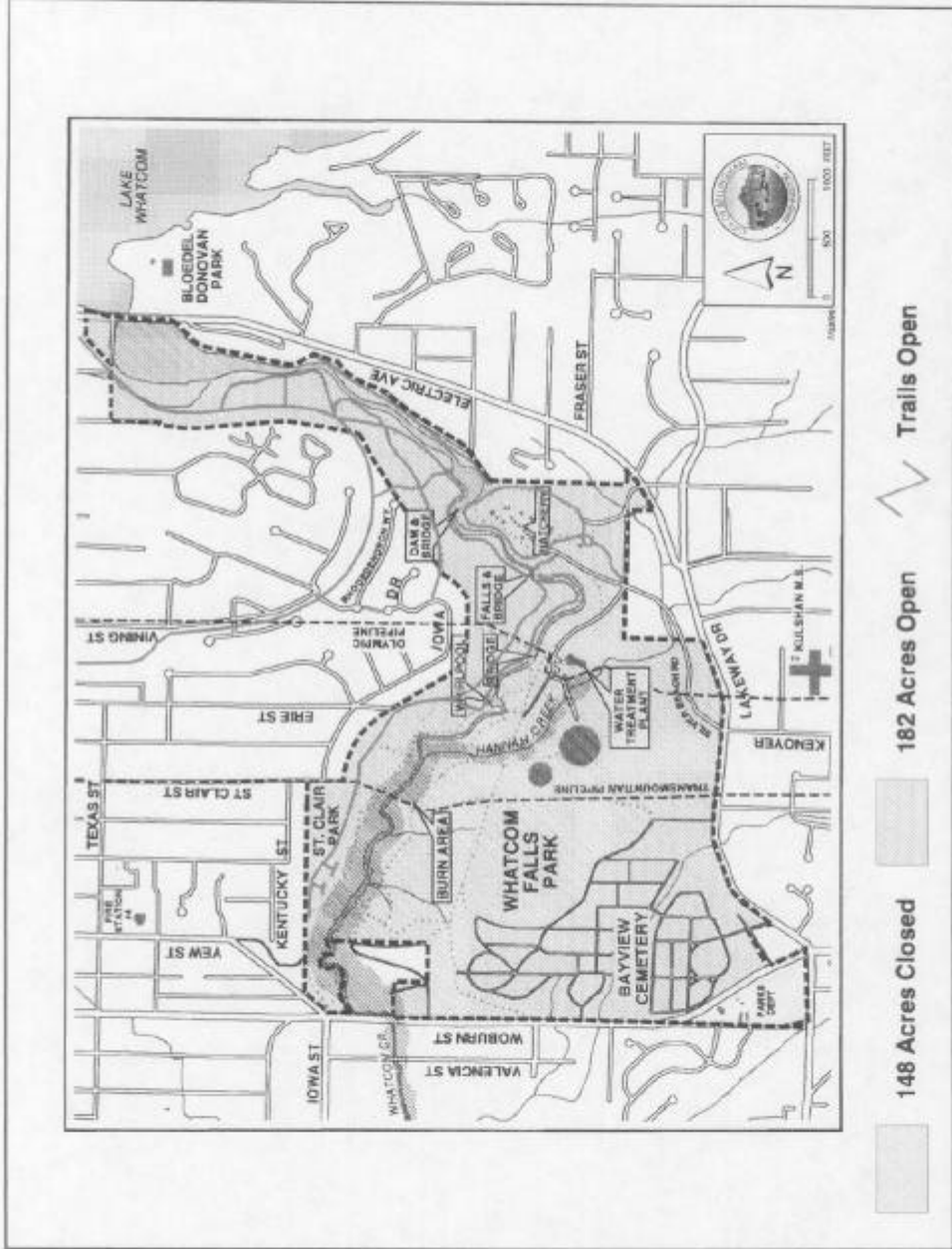
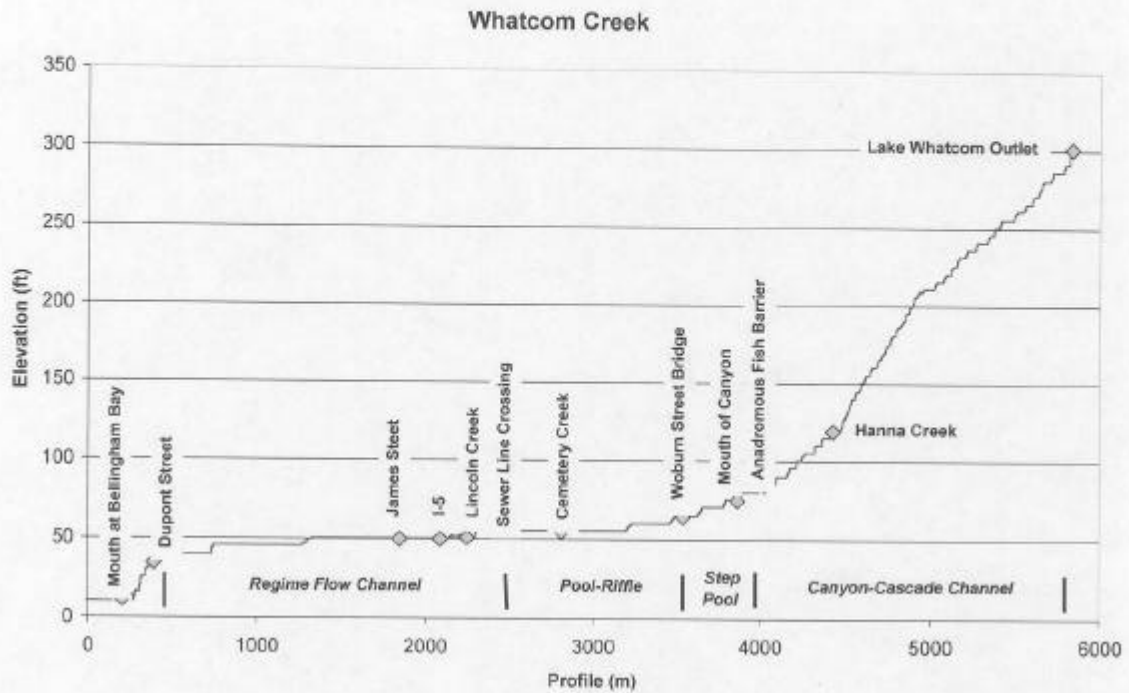
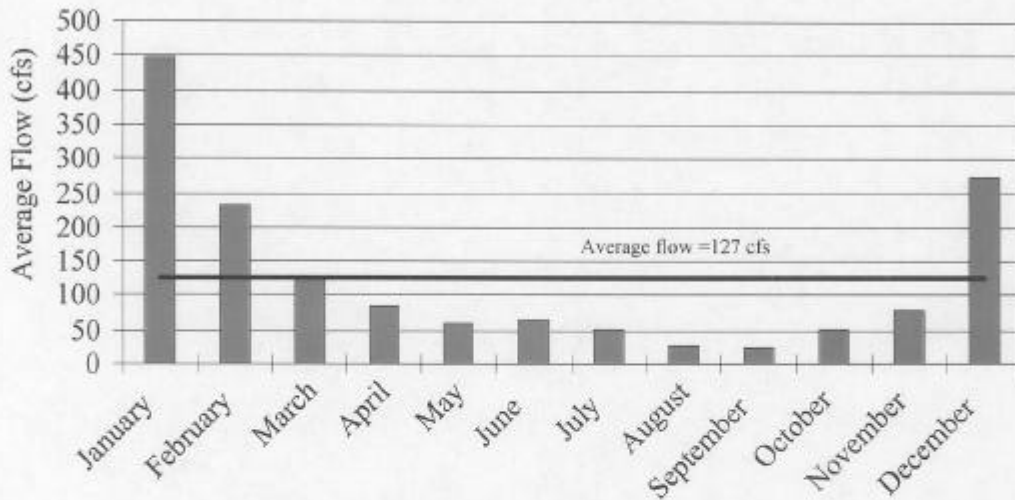


Figure 9: Map of Whatcom Falls Park. Closures from September 22-November 21, 1999





**Figure 10: Whatcom Creek Vertical Profile**



**Figure 11: Average Monthly Flows for Whatcom Creek**

Exhibit 4-1

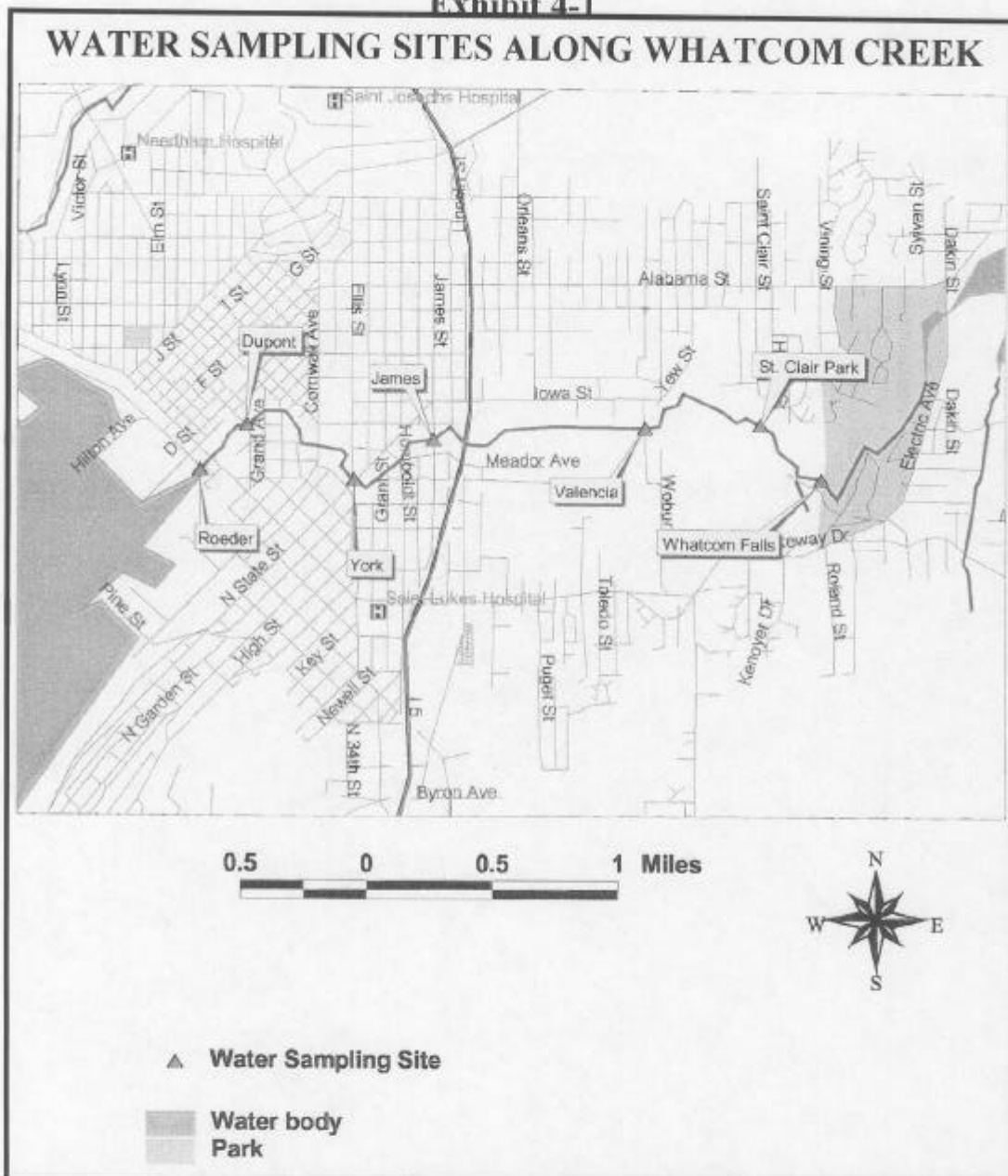


Figure 12: Map of Water Sampling Stations in Creek

## WATER SAMPLING SITES IN BELLINGHAM BAY

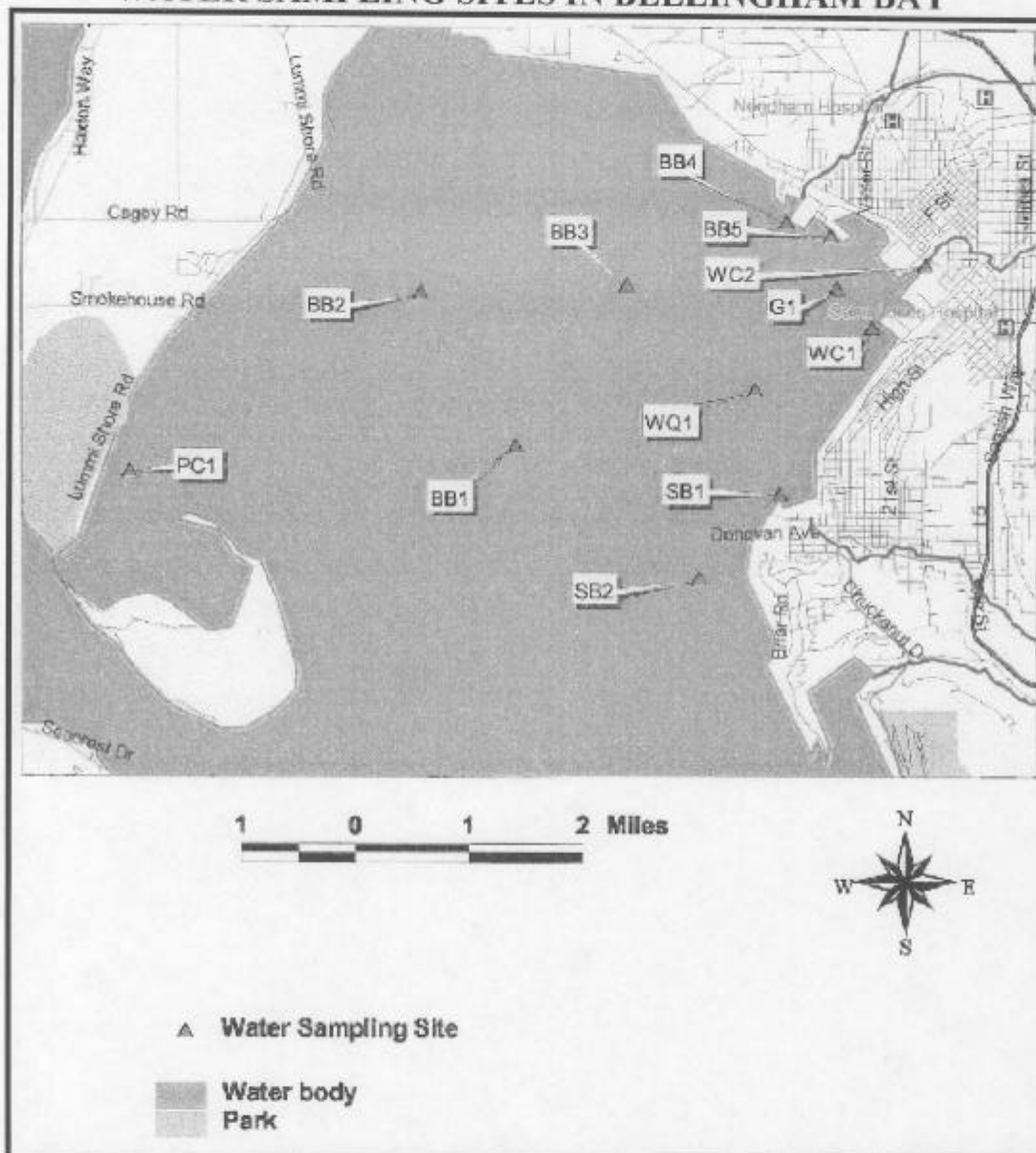
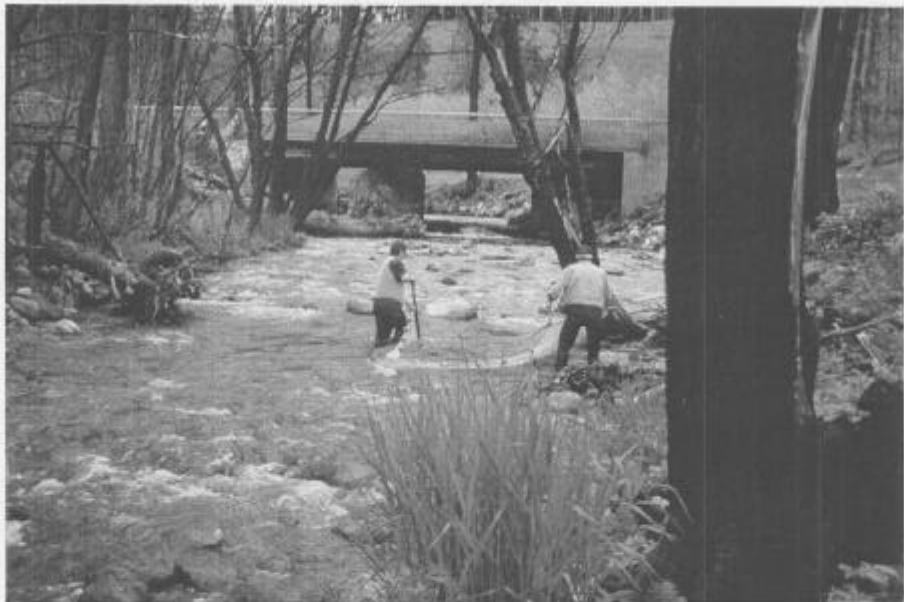


Figure 13: Map of Water Sampling Stations in Bellingham Bay



**Figure 14: Spawning areas**



**Figure 15: Beach Seine Surveys, May 2000**



**Figure 16: Dead Lamprey in the Whatcom Waterway**



**Figure 17: Deer in Whatcom Creek**

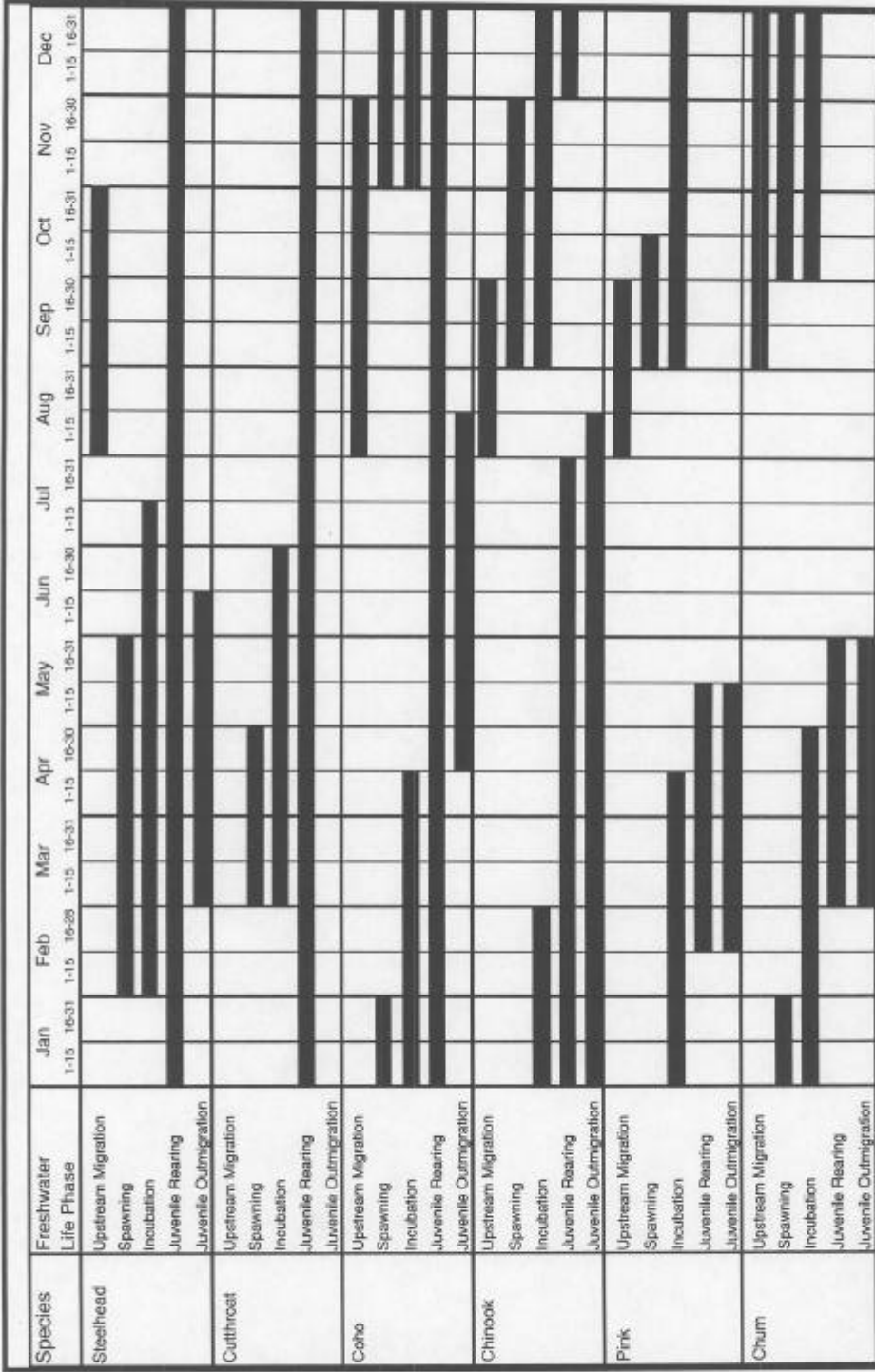


Figure 18: Seasonality of Salmonid Utilization



**Figure 19: Hanna Creek Remediation (Before)**



**Figure 20: Hanna Creek Remediation (After)**



**Figure 21: Aerial photograph of burn zone**

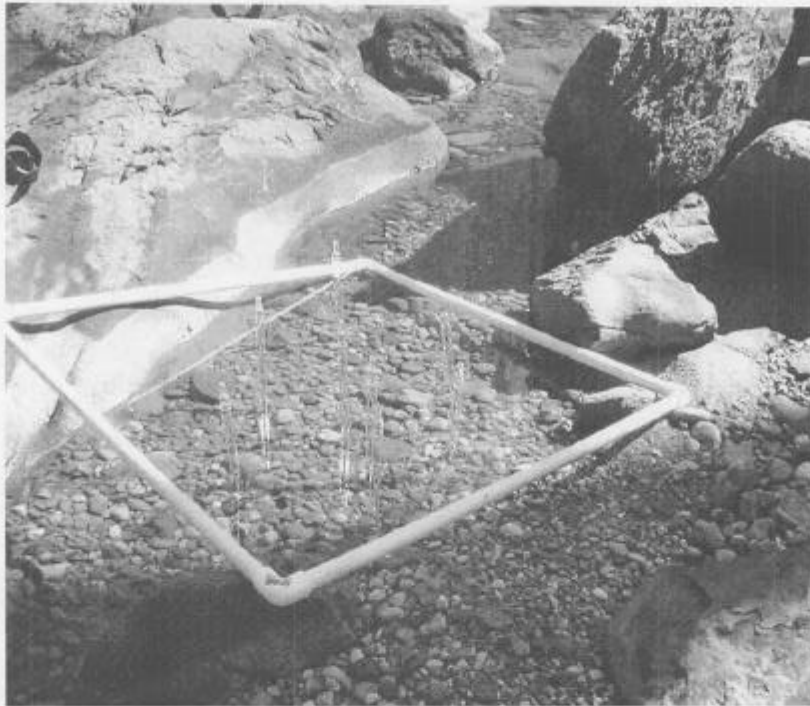


**Figure 22: Close-up of burn zone**





**Figure 23: Hydroseeding**



**Figure 24: Sampling with pipette**



**Figure 25: Fires in Creek**



**Figure 26: Creation of Pool Habitats**

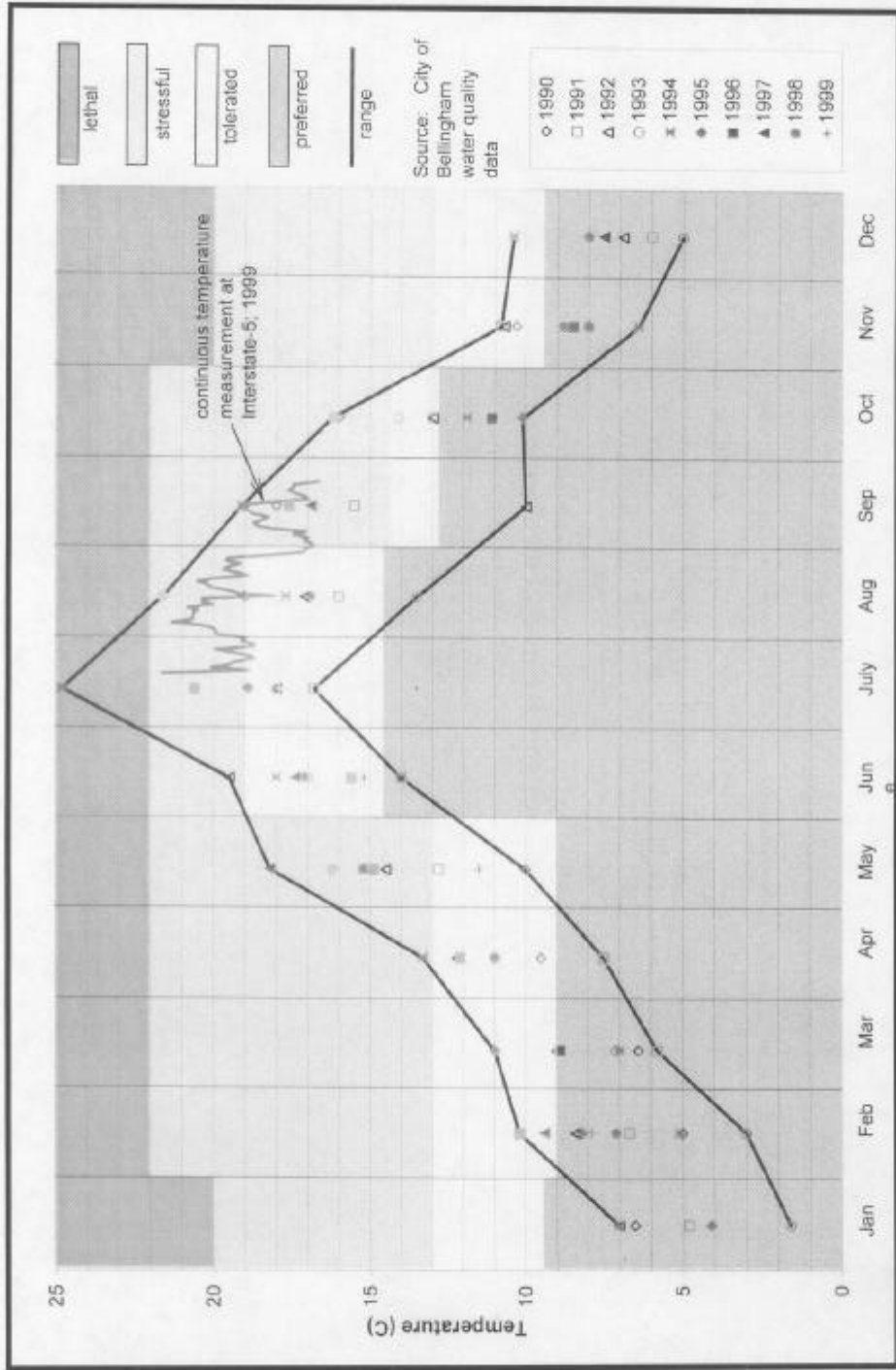


Figure 27: Chart of Fish thermal stress



**Figure 28: Heavy Equipment Working in Stream**



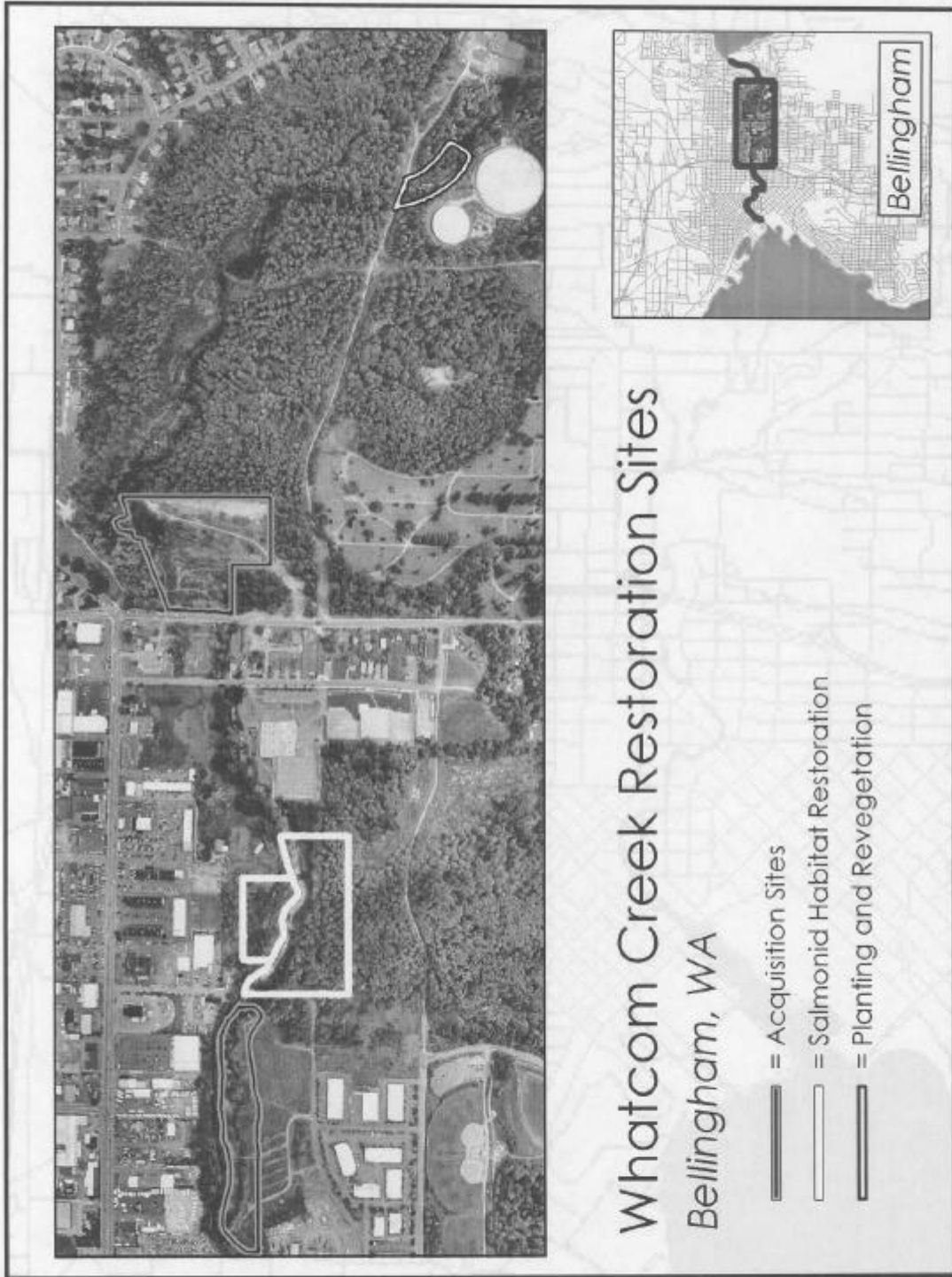
**Figure 29: Completed placement of woody debris in stream**



**Figure 30: Closure sign in park**



**Figure 31: Newly Planted Tree**



**Figure 32: Map of Long-Term Restoration Sites**



**Figure 33: Picture of Whatcom Reach project site (August 2001)**



**Figure 34: Picture of Haskell project site (May 2000)**

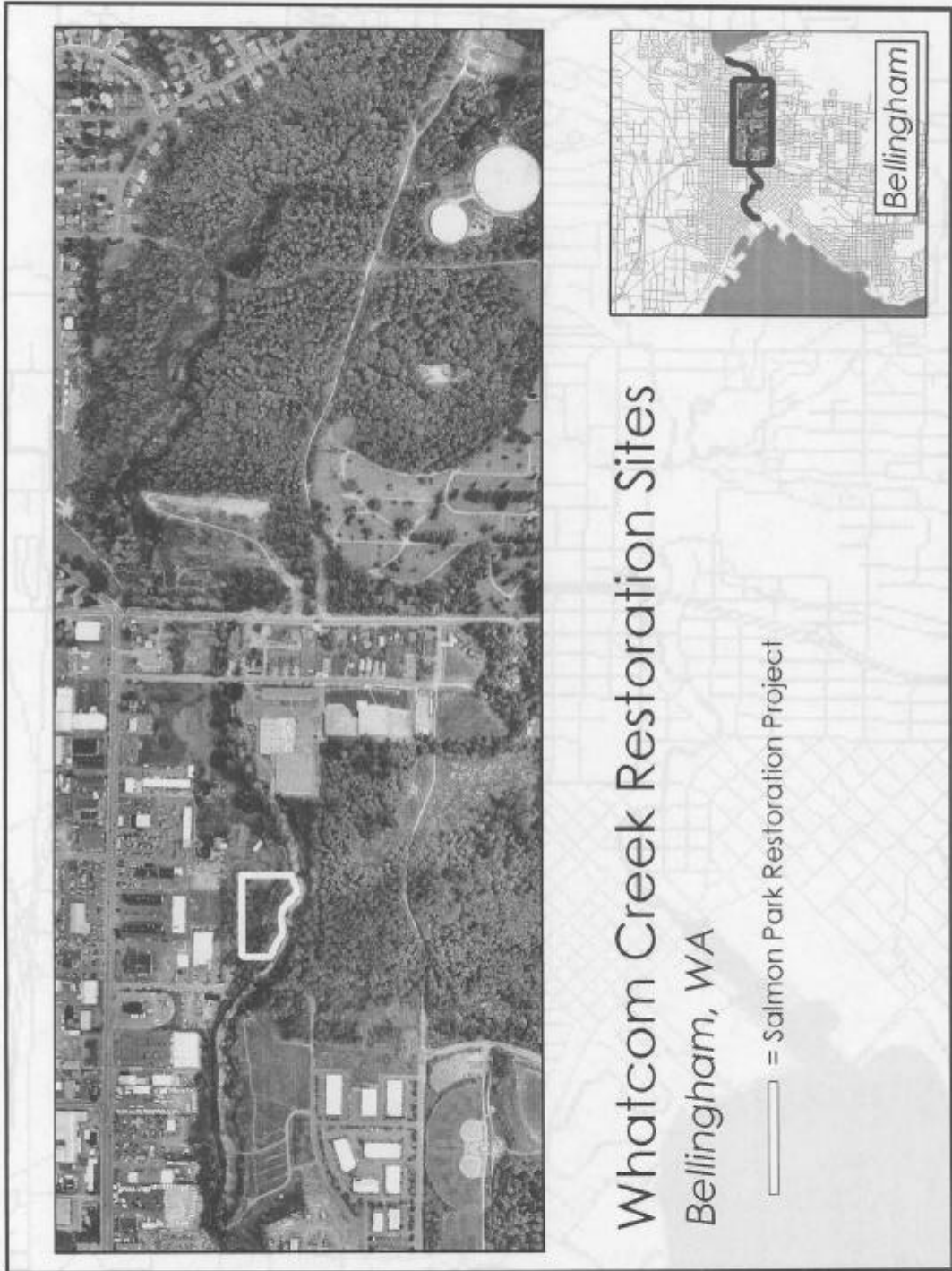


**Figure 35: New Fever Creek Bridge**

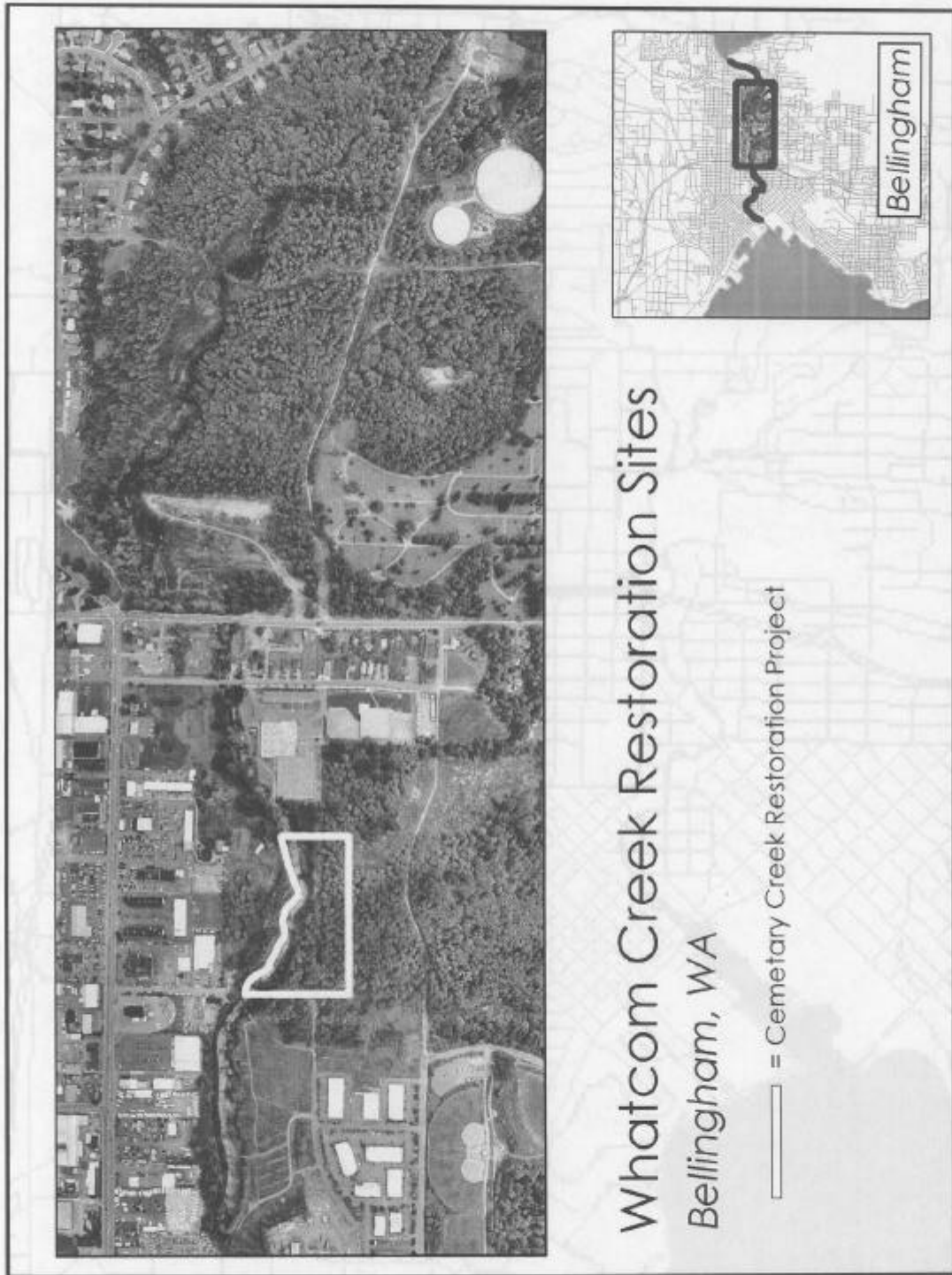


**Figure 36: New Valencia Street Bridge**

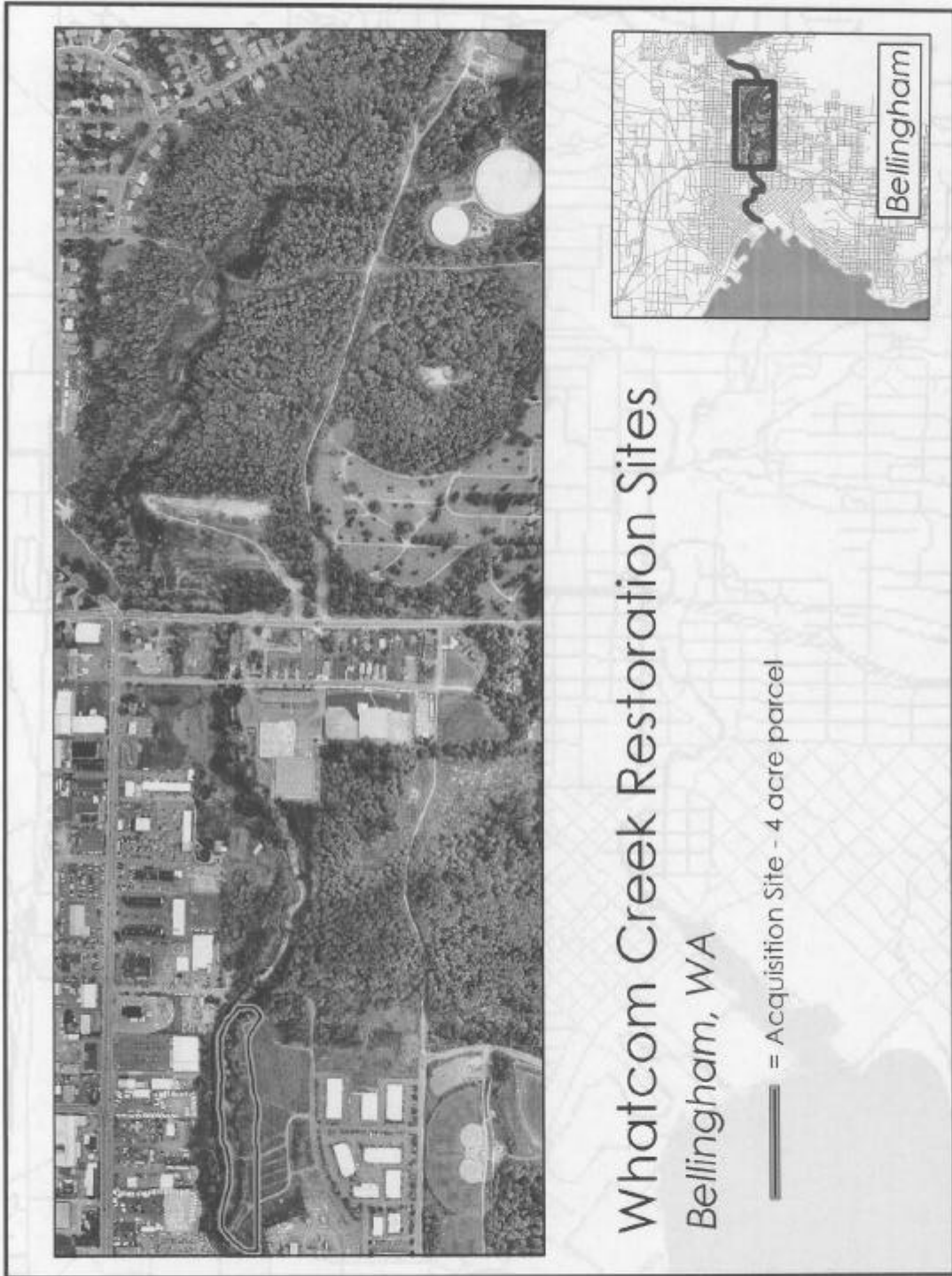




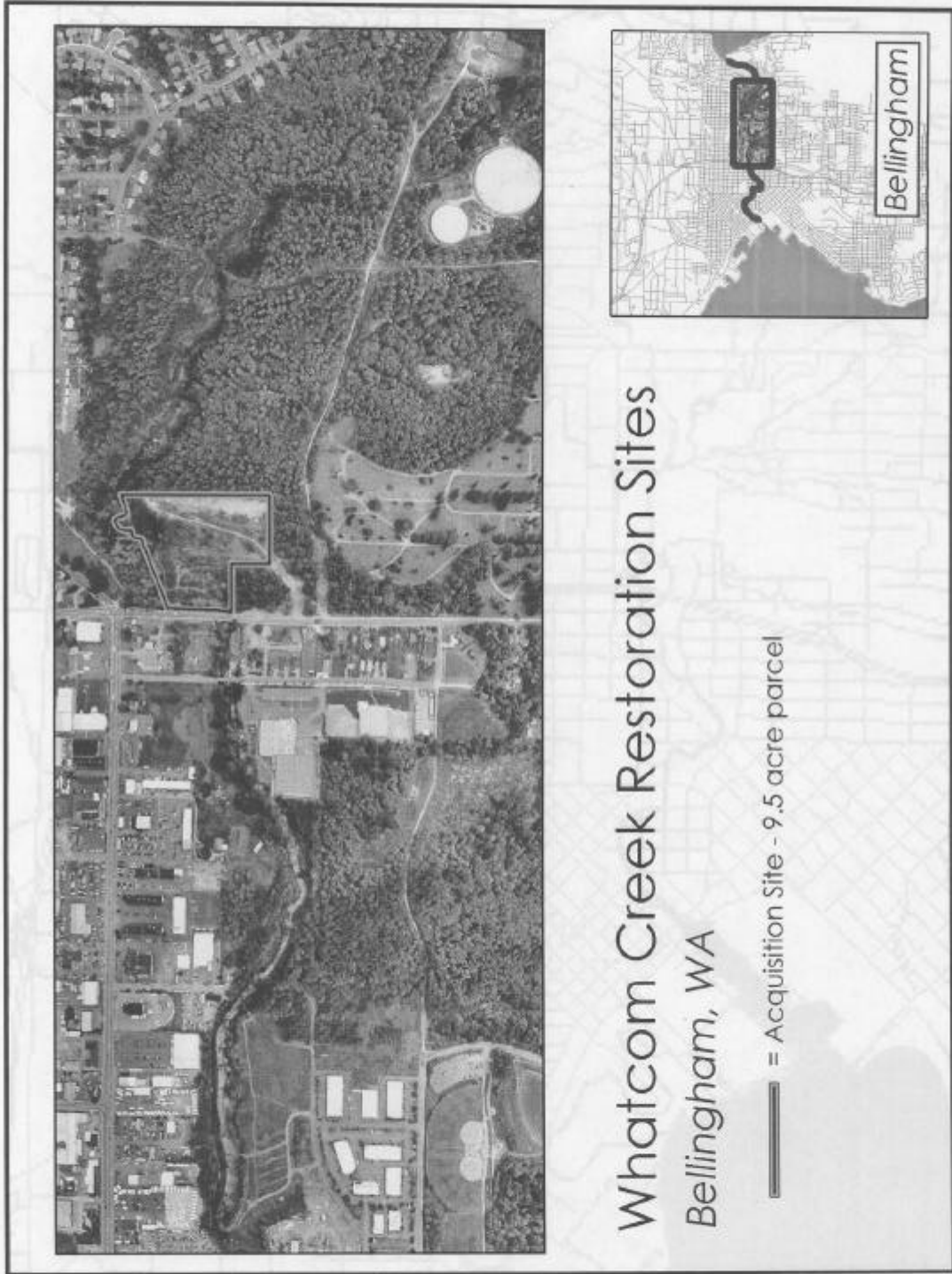
**Figure 37: Salmon Park Location Map**



**Figure 38: Cemetery Creek Project Location Map**



**Figure 39: 4-Acre Acquisition Site**



**Figure 40: 9.5-Acre Acquisition Site**