

INTRODUCTION

This summary presents data from monitoring activities conducted by King County staff and members of the Washington State University research team (WSU) in the Agricultural Drainage Assistance Program (ADAP) in 2002. The primary goals of these data are to provide interim information collected by the WSU team, and to update permit agencies on data collected within calendar year 2002. These measures were required as part of the landowner's Hydraulic Project Approval (HPA's 00-D6982-01, 00D6983-01, 00-D6984-01, and 00-E7721-02) and the Clearing and Grading Permits (L97G0163 and L00CU016) issued by the King County Department of Development and Environmental Services in 1998, 1999, and 2001. Further monitoring efforts specified in this document are necessary to track changes in the condition of aquatic resources as a result of watercourse maintenance. A map of the Agricultural Production Districts in King County are included as Appendix A.

FISH SAMPLING DESCRIPTION/RESULTS FOR THE MIDDLE DITCH

The Middle Ditch, described in the 2001 monitoring report (Berge 2002) was sampled for post-project fish use on January 16, 2002 and April 23, 2002. There were 8 coho captured on January 16th that ranged in size from 60-85mm. On April 23rd, 40 coho were captured with a size range of 45-60mm. Additionally fish presence was sampled on July 18, 2002. Minnow traps were used to capture fish in several locations throughout the project. A total of 9 coho were caught with a size range of 40-80mm. There was one 100mm cutthroat trout captured. Other fish trapped included 3 stickleback, 1 pumpkinseed, and one brook lamprey. There was one crayfish captured in the sampling effort. A map of this project site is included as Appendix B.

Temperature and DO was measured at three locations on July 17, 2002. At the upstream end of the project, temperature was 12.2 degrees Celsius and DO measured at 11.9 mg/L. The downstream end of the project had a temperature of 16.9 degrees and DO measured at 8.77 mg/L. Temperature and DO was also measured in Tuck Creek immediately upstream of the middle ditch. They measured in at 21.3 degrees and 9.77 mg/L.

Table 1: Fisheries data collected at the Middle Ditch

Species	Live Fish	Length Range	Weight Range	Mortalities
1/16/02				
Coho	8	60-85mm	*	0
4/23/02				
Coho	40	45-60mm	*	0
7/18/02				
Coho	9	45-80mm	*	0
Cutthroat	1	100mm	*	0
Sticklebacks	3	*	*	0
Brook Lamprey	1	100	*	0

* Measurement not taken.

FISH SAMPLING DESCRIPTION/RESULTS FOR THE SOUTH DITCH

The south ditch, described in the 2001 monitoring report (Berge 2002) was sampled for fish on January 16, April 23 and July 18, 2002. Minnow traps were used to capture fish in five locations.

No fish were captured during the January 16th sampling effort. On April 23rd, there were 30 sticklebacks ranging in length from 20-30mm. One northwest salamander was also captured. On July 18th, there were 40 sticklebacks and 6 northwest salamanders captured. A map of this project site is included as Appendix B.

Temperature and DO were also measured at two locations on April 23rd. The first location had a temperature of 21.9 degrees and DO measured at 0.96 mg/L. The second location measured temperature at 19.8 degrees and DO at 3.02 mg/L.

Table 2: Fisheries data collected in the South Ditch

Species	Live Fish	Length Range	Weight Range	Mortalities
1/16/02				
None	0	N/A	N/A	N/A
4/23/02				
Stickleback	30	20-30mm	*	0
7/18/02				
Stickleback	4	40mm	*	0

*Measurement not taken

FISH SAMPLING DESCRIPTION/RESULTS FOR THE CHERRY VALLEY TRIBUTARY

On July 2, 2002, a post-project monitoring effort was made to sample current fish use in the Cherry Valley tributary described in the 2001 monitoring report (Berge 2002). Minnow traps were used as a sample method to capture fish. There were 4 coho sampled that ranged in length from 40-87mm. A total of 40 sticklebacks were captured at two locations within the project site. One brook lamprey was trapped at this site. A map of this project site is included as Appendix C.

Dissolved Oxygen (DO) and temperature were also measured when sampling for fish. Measurements were taken in two locations at the upstream and downstream ends of the project. DO at the beginning of the project was 9.51 mg/L and 7.21 mg/L at the end. Temperature was measured at 17.9 degrees Celsius at the beginning of the project and 20.7 degrees Celsius at the end.

Table 3: Fisheries sampling for Cherry Valley Tributary

Species	Live Fish	Length Range	Weight Range	Mortalities
Coho	4	40-87mm	*	0
Sculpins	0	N/A	*	0
Sticklebacks	40	*	*	0
Brook Lamprey	1	*	*	0

* Measurement not taken

FISH SAMPLING DESCRIPTION/RESULTS FOR THE AMES LAKE CREEK PROJECT

On February 6, 2002, there was a post-project sampling effort made to identify the fish species. A 300-foot representative reach was sampled. This reach had an average 8-foot width and an 8-foot depth. The substrate was a 100% silt bottom. Flow was measured at a velocity of 7 inches per second. A map of this project site is included as Appendix D.

The sample method used was electrofishing using a single pass. There was a total shocking time of 874 seconds. There were 29 coho collected that ranged in length from 60-100 mm and their weights ranged from 2.5-10 grams. There was one coho mortality during this sample effort. There were 8 sculpins collected that had lengths ranging from 46 to 104 mm and weights between 0.8 and 15 grams. Eleven sticklebacks were sampled with lengths from 37-68 mm and a weight range of 0.5-4 grams. The final species collected was 2 brook lamprey that had lengths of 150mm and 155mm. Both lampreys weighed 5 grams.

Table 4: Species caught, length and weights at the Ames Lake Creek Tributary site in 2002.

Species	Live Fish	Length Range	Weight Range	Mortalities
Coho	29	60-100mm	2.5-10 grams	1
Sculpins	8	46-104mm	0.8-1.5 grams	0
Sticklebacks	11	37-68mm	0.5-4 grams	0
Brook Lamprey	2	150-155mm	5 grams	0

Vegetation Monitoring

Following ditch maintenance in 2001, willows were planted as part of the mitigation requirements. The planting for the project occurred on January 23, 2002. After nine months months, approximately 68% of the willows (poles and stakes collectively) survival of 41% of the willow poles and 43.4% of the willow stakes survived during that period. As a consequence of poor survivorship, we replanted the site. A replanting of the willows took place on January 21, 2003. During the summer of 2003, we revisited the site and found that we had over 100% survivorship of the mitigation vegetation, which included both plantings. The site will be monitored again next spring to determine if we need to plant additional willows.

Table 5: Vegetation Monitoring Results at Ames Lake Creek Tributary Site

Species	Total Planted	Total Live	Total Dead	Total Stressed	Total Missing
10/24/02					
Willow Poles	125	45	1	5	74
Willow Stakes	435	172	2	15	246
7/3/03					
Willow Stakes and Poles	560	569	27	21	0

CONCLUSION

In King County APDs, it appears that salmonids, particularly coho, use agricultural drainage ditches for rearing at different times of the year. It is important that these critical over-winter habitats are protected from further degradation.

Watercourse maintenance appears to have affected salmonid use of these habitats. In each project site that we have monitored, with the exception of the South Ditch and the North and Middle Ditches of Tuck Creek for which we do not have pre-project data, we have seen a decrease of salmonid use immediately following excavation (Berge 2002). However, this is not necessarily the case over time. If the extent of loss is only reflective in the first few year's following maintenance, further monitoring efforts will verify this. Research efforts currently underway by

the WSU team will examine this observation more thoroughly, and will help provide further recommendations of potential mitigation and restoration for fisheries recovery in these waterways.

Vegetation plays a critical role in the recovery of these ditches. It is expected that salmonid use and macroinvertebrate diversity will increase in these ditches as the vegetation required for mitigation matures, providing a rich source of allochthonous material for these aquatic environments (Rader 1997; Dolloff 1986). Without successful colonization of native trees and shrubs, these areas will not provide adequate fish habitat.

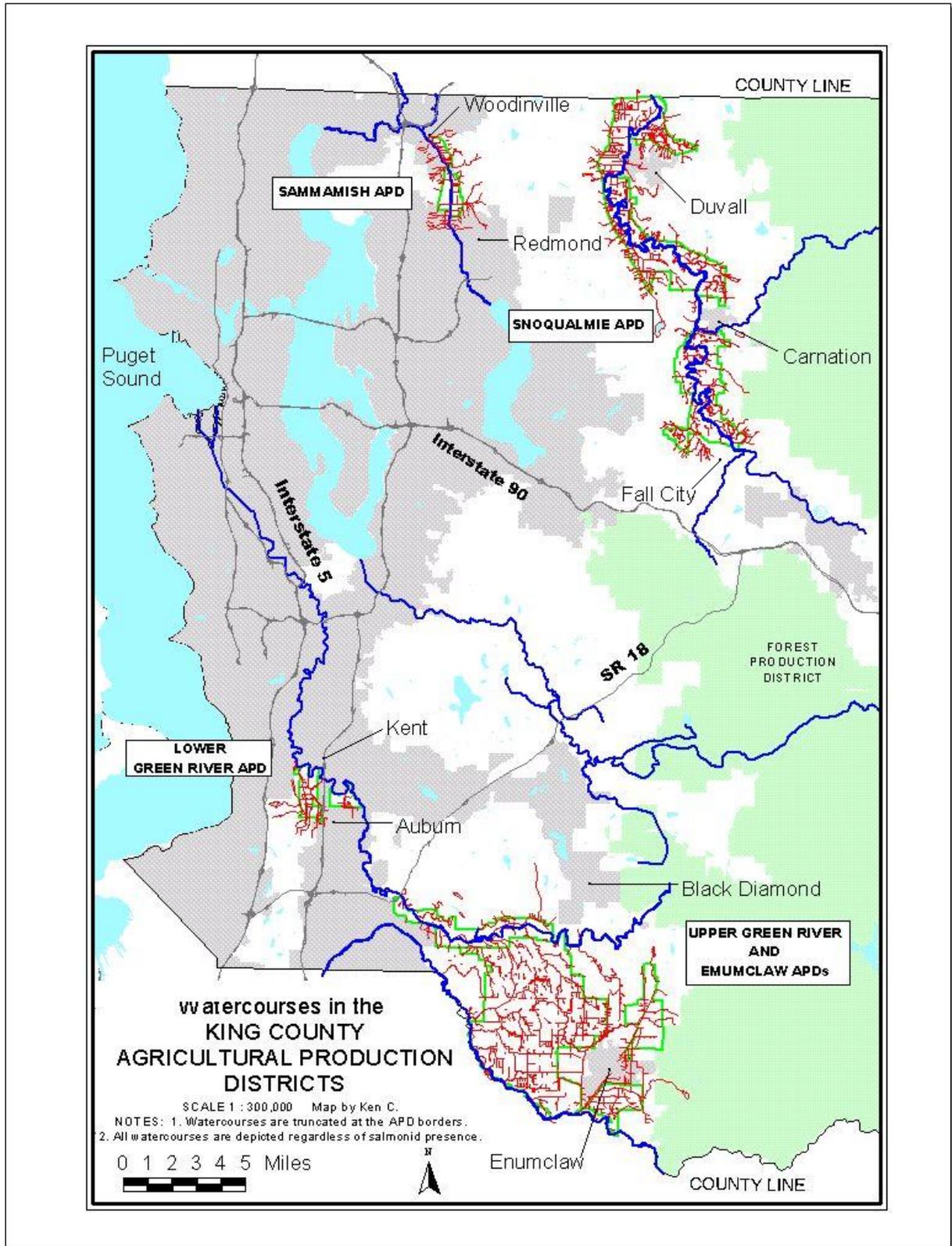
Salmonids can tolerate temperature extremes, but often they will migrate out of an area if temperature fluctuations are too dramatic (Bjornn 1978). In all cases we found the maximum temperature in project watercourses to be below the lethal level for salmonids, and in many cases we found the maximum temperature was near the optimum (Bjornn and Reiser 1991; Brett 1952; Bell 1986) for the species encountered in the project watercourses.

In some instances, ditch maintenance may actually benefit salmonids using these watercourses. For example, the South Ditch contains habitat better suited to salmonids than prior to dredging in 1999, and provides access to habitat that was not available prior to maintenance. Continued sampling of this watercourse will help us to understand salmonid use of these tributaries, and similar agricultural waterways.

REFERENCE

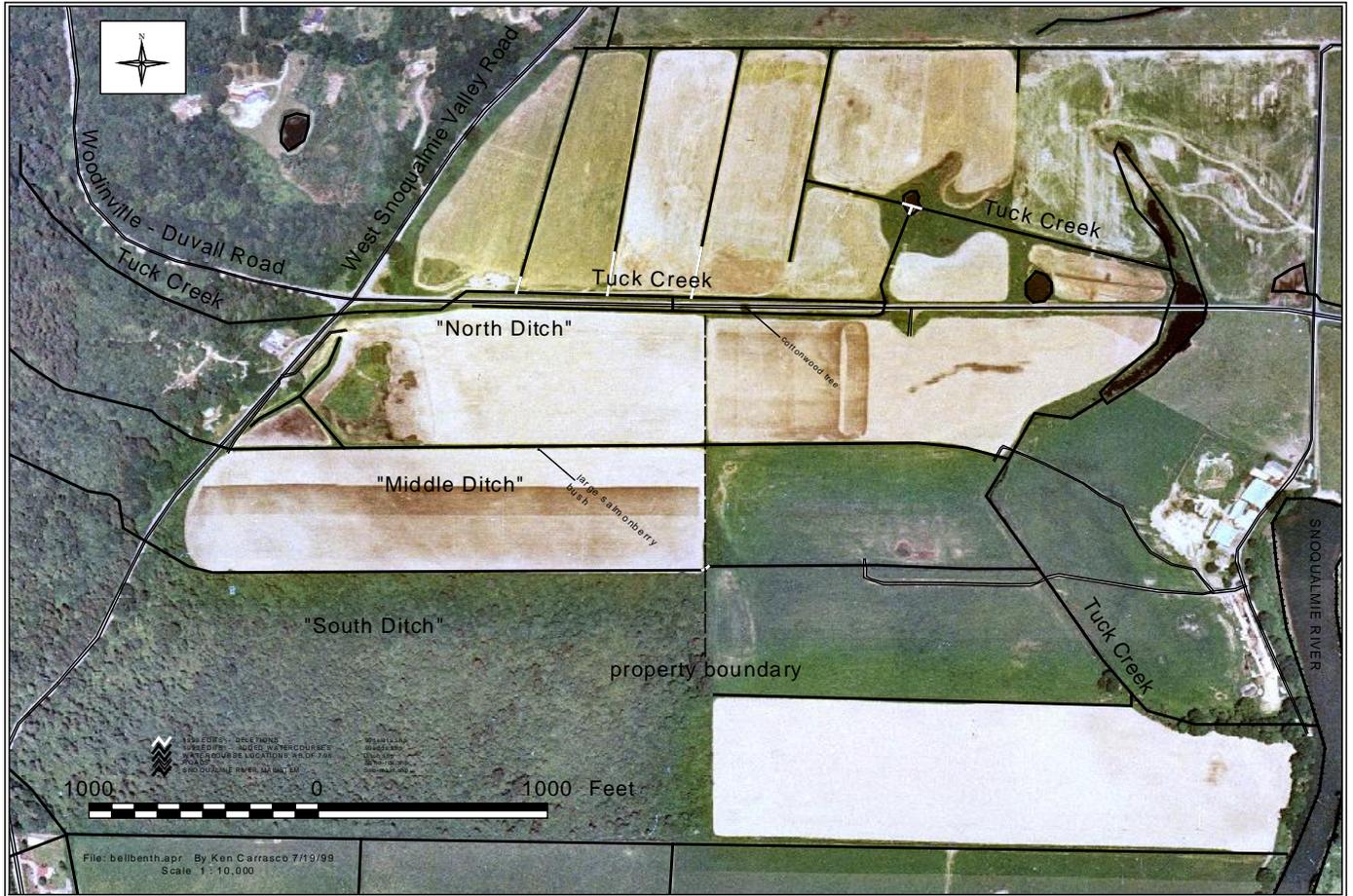
Berge, H. B.. 2002. 2001 Annual Monitoring Report. King County Agricultural Drainage Assistance Program. King County Department of Natural Resources and Parks. Available at: <ftp://dnr.metrokc.gov/dnr/library/2002/kcr763.pdf>

APPENDIX A: MAP OF KING COUNTY AGRICULTURAL PRODUCTION DISTRICTS

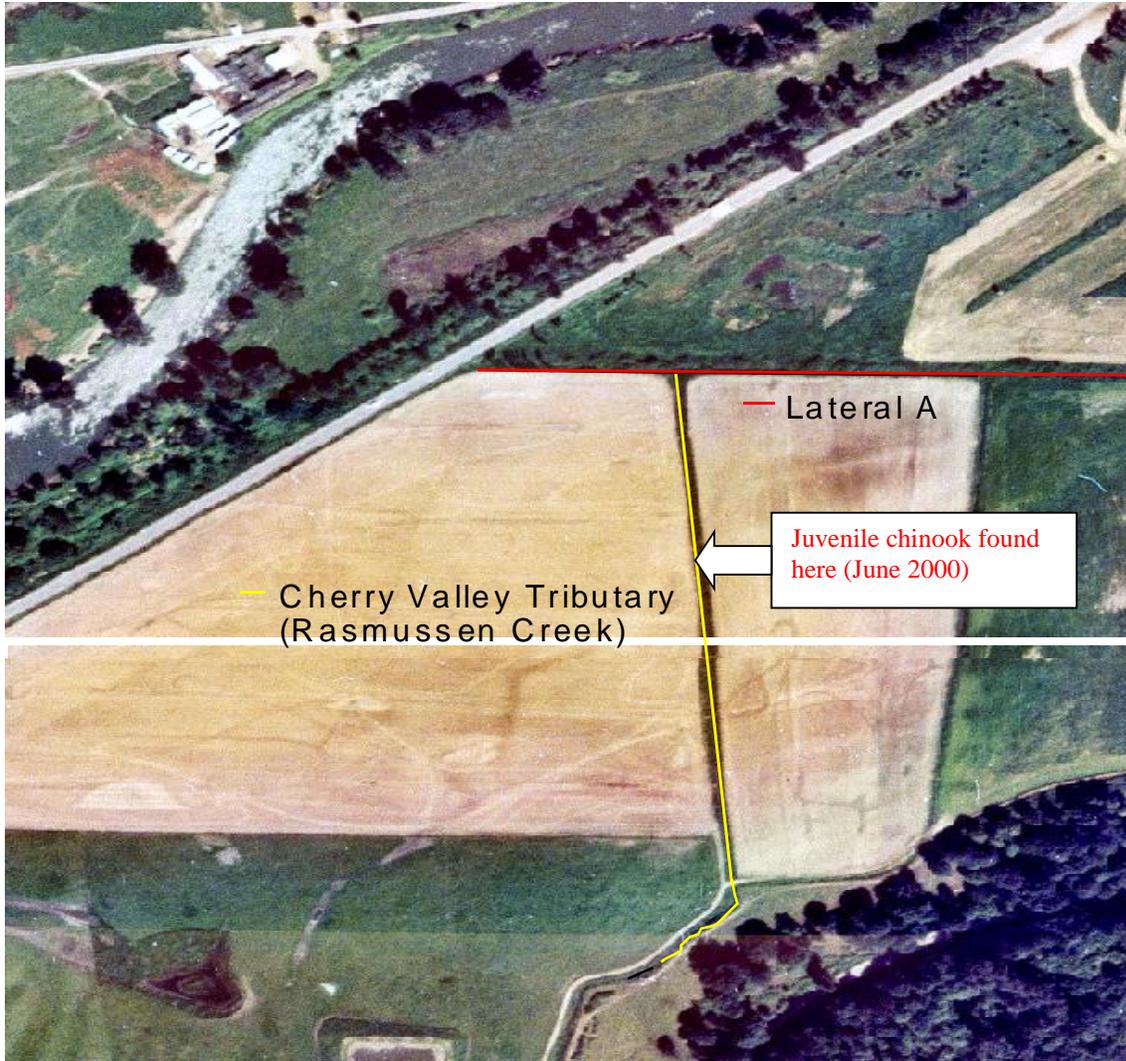


APPENDIX B: MAPS OF 1998 AND 1999 PROJECT SITES IN THE SNOQUALMIE APD

TUCK CREEK TRIBUTARIES

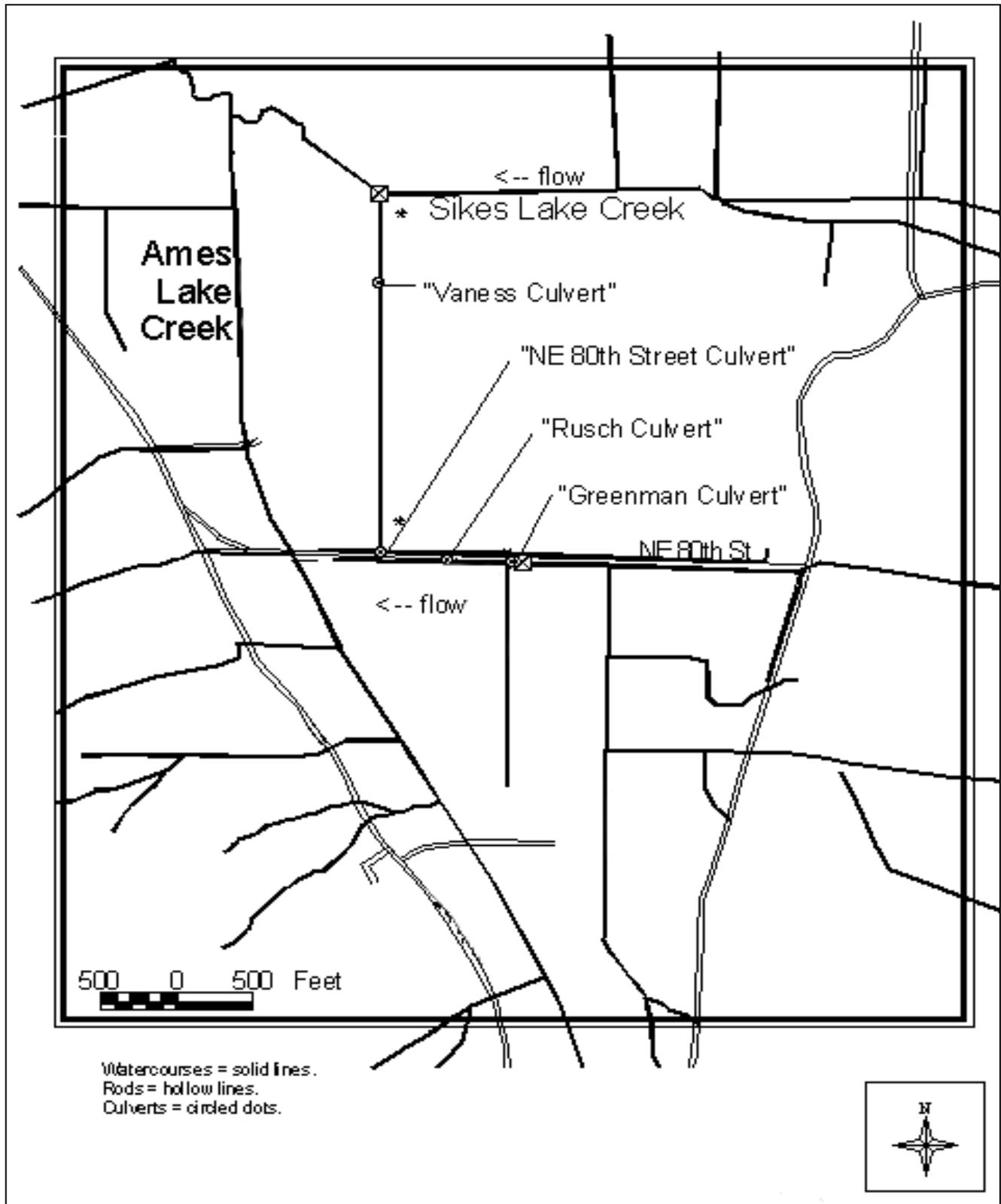


APPENDIX C. CHERRY CREEK TRIBUTARY PROJECT SITE



200 0 200 400 Feet

APPENDIX D: MAP OF AMES LAKE CREEK TRIBUTARY PROJECT AREA



PHOTOS OF THE AMES LAKE CREEK PROJECT



Pre-Project Reach B in March 2001



Post-Project Reach B in November 2001



Post-Project Reach B in April 2002



Post-Project Photo of Reach B in August 2002