Weiser Flat TMDL Implementation Plan for Agriculture

Idaho Association of Soil Conservation Districts
Idaho Soil Conservation Commission
September 2004

Table of Contents

1.0	Background	4
2.0	Identification of Critical Acreage	6
3.0	TMDL Objectives	9
4.0	Implementation Plan BMPs	9
4.1	Example Description of Alternatives for Surface Irrigated Cropland	10
4.2	Example Description of Alternatives for Surface Irrigated Pasture	10
4.3	Example Description of Alternatives for CAFO/AFO	10
4.4	BMP Costs	11
4.5	Graphic Comparison of BMP Selection and Implementation Process	11
4.6	Feedback Loop	11
5.0	Program of Implementation	12
5.1	Installation and Financing	12
5.2	Operation, Maintenance, and Replacement	13
5.3	Existing Efforts	13
5.4	Water Quality Monitoring	13
6.0	Hog Creek Subwatershed	14
7.0	Warm Springs Creek Subwatershed	17
8.0	Scott Creek Subwatershed	20
9.0	Jenkins Creek Subwatershed	23
10.0	Snake River Tributaries Subwatershed	26
11.0	Galloway Canal Subwatershed	29
12.0	Storage Ponds Subwatershed	31

List of Figures

Figure 1.	Weiser Flat Location	4
Figure 2.	Weiser Flat	5
Figure 3.	Subwatershed Boundaries	6
Figure 4.	Weiser Flat Critical Acreage	8
Figure 5.	Hog Creek Subwatershed Critical Acreage	15
Figure 6.	Warm Springs Creek Subwatershed Critical Acreage	18
Figure 7.	Scott Creek Subwatershed Critical Acreage	21
Figure 8.	Jenkins Creek Subwatershed Critical Acreage	24
Figure 9.	Snake River Tributaries Subwatershed Critical Acreage	27
Figure 10.	Galloway Canal Subwatershed Critical Acreage	30
Figure 11.	Storage Ponds Subwatershed Critical Acreage	32

List of Tables

Table		Page
Table 1.	Pollutant Summary	4
Table 2.	Weiser Flat Watershed Agricultural Acreage	7
Table 3.	2003 Agricultural Data for Weiser Flat Watershed (Total)	8
Table 4.	Treatment Unit 1: Surface Irrigated Cropland	9
Table 5.	Treatment Unit 2: Surface Irrigated Pasture	9
Table 6.	Treatment Unit 3: CAFO/AFO	9
Table 7-11.	Estimated BMP Cost Summary for Weiser Flat Treatment Units	12-13
Table 12.	Hog Creek Subwatershed Agricultural Acreage	14
Table 13.	2003 Agricultural Data for Weiser Flat Watershed (Hog Creek)	14
Table 14-17.	Estimated BMP Cost Summary for Hog Creek Treatment Units	15-16
Table 18.	Warm Springs Creek Subwatershed Agricultural Acreage	17
Table 19.	2003 Agricultural Data for Weiser Flat Watershed (Warm Springs Creek)	17
Table 20-24.	Estimated BMP Cost Summary for Warm Springs Creek Treatment Units	18-19
Table 25.	Scott Creek Subwatershed Agricultural Acreage	20
Table 26.	2003 Agricultural Data for Weiser Flat Watershed (Scott Creek)	20
Table 27-31.	Estimated BMP Cost Summary for Scott Creek Treatment Units	21-22
Table 32.	Jenkins Creek Subwatershed Agricultural Acreage	23
Table 33.	2003 Agricultural Data for Weiser Flat Watershed (Jenkins Creek)	23
Table 34-37.	Estimated BMP Cost Summary for Jenkins Creek Treatment Units	24-25
Table 38.	Snake River Tributaries Subwatershed Agricultural Acreage	26
Table 39.	2003 Agricultural Data for Weiser Flat Watershed (Snake River Tributaries)	26
Table 40-44.	Estimated BMP Cost Summary for Snake River Tributaries Treatment Units	27-28
Table 45.	Galloway Canal Subwatershed Agricultural Acreage	29
Table 46.	2003 Agricultural Data for Weiser Flat Watershed (Galloway Canal)	29
Table 47-48.	Estimated BMP Cost Summary for Galloway Canal Treatment Units	30
Table 49.	Storage Ponds Subwatershed Agricultural Acreage	31
Table 50.	2003 Agricultural Data for Weiser Flat Watershed (Storage Ponds)	31
Table 51-52.	Estimated BMP Cost Summary for Storage Ponds Treatment Units	32

1.0 Background

Agricultural land uses in the Weiser Flat account for 10,307 of the approximately 14,400 total acres within the Weiser Flat Watershed. In addition, eight CAFO/AFO units have been identified within the Weiser Flat. The watershed includes the lower portions of Hog Creek (2.1 stream miles), Warm Springs Creek (3.8 stream miles), Scott Creek (7.2 stream miles), and Jenkins Creek (5.6 stream miles) as well as a number of unidentified drains discharging to the Snake River. All four creeks flow in a southwesterly direction from the foothills to the Snake River in Washington County, Idaho. Each of the creeks have been identified as impaired as a result of the pollutants identified in Table 1.

Figure 1. Weiser Flat Location

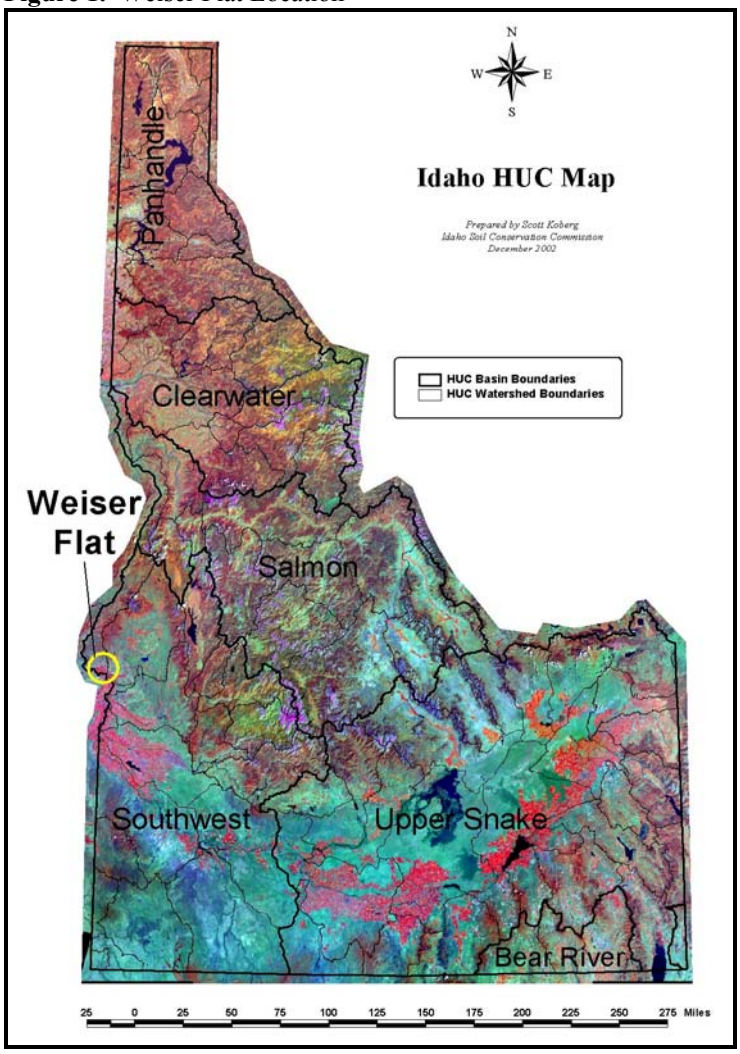


Table 1. Pollutant Summary

Weiser Flat HUC# 17050201		
Stream Segment of Concern	**WQLS**	**Pollutants**
Hog Creek	2829	Nutrients Sediment Bacteria
Warm Springs Creek	2828	Nutrients Sediment Bacteria
Scott Creek	2830	Nutrients Sediment Bacteria
Jenkins Creek	2831	Nutrients Sediment Bacteria

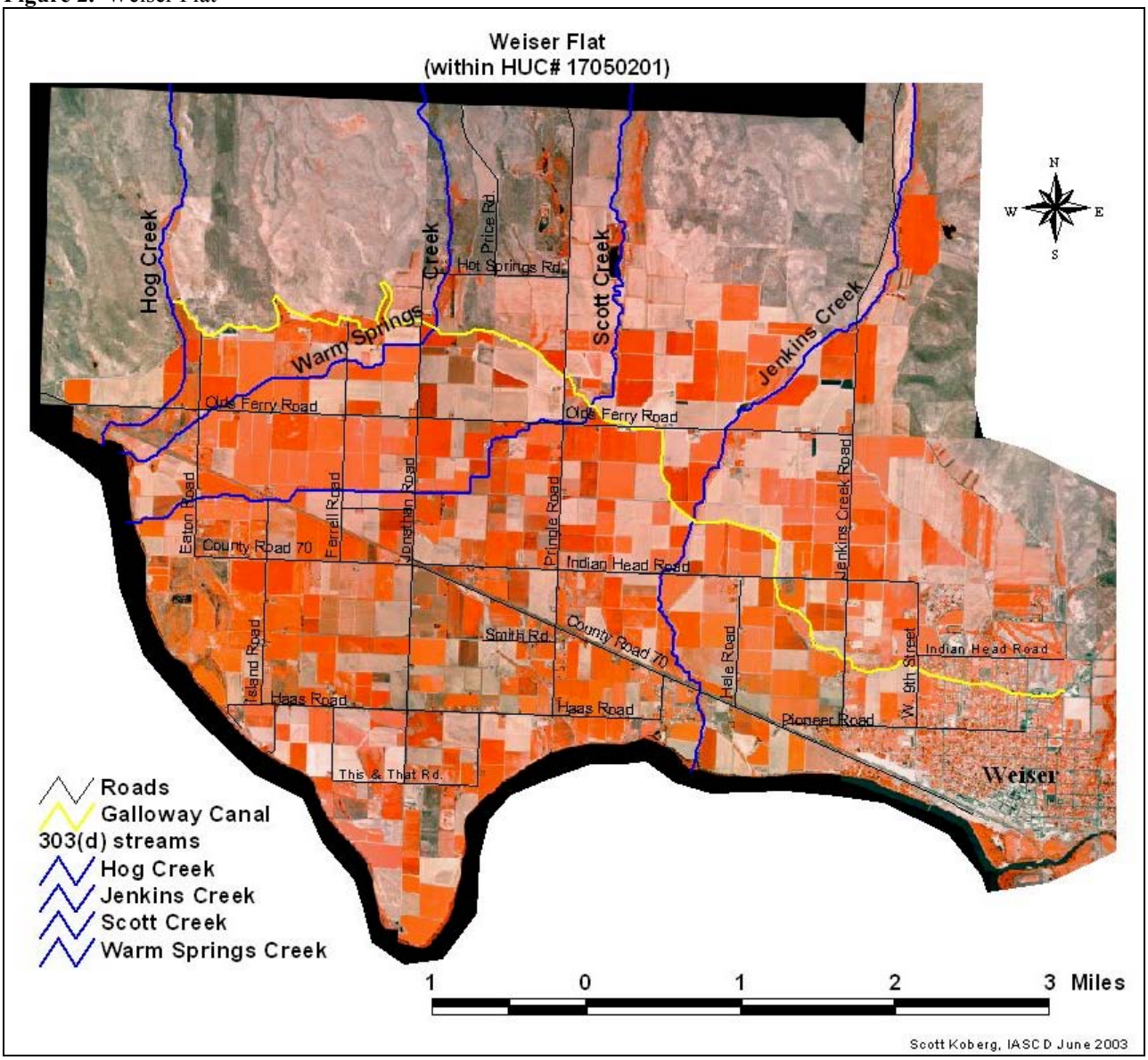
A draft Subbasin Assessment for the Brownlee Reservoir (Weiser Flat) TMDL was completed by Idaho Department of Environmental Quality (IDEQ) and approved by the Environmental Protection Agency (EPA) in August 2003. A summary of the pollutants IDEQ identified as impairing beneficial uses is located in Table 1. This implementation plan will address the nonpoint, agricultural sources of nutrients, sediment, and bacteria that impact Hog, Warm Springs, Scott, and Jenkins Creeks as well as the other sources indirectly impacting the Snake River from the Weiser Flat.

The costs to install BMPs on agricultural lands are estimated in this plan to provide the local community, government agencies, and watershed stakeholders some perspective on the economic demands of meeting the TMDL goals. Availability of cost-share funds to agricultural producers within the Weiser Flat Watershed will be necessary for the success of this plan and the final reduction of pollutants necessary to meet the TMDL requirements within each of the 303(d) listed segments. Sources of available funding and technical assistance for the installation of BMPs on private agricultural land are included in the Appendices. Proposed BMPs include, but are not limited to, sprinkler irrigation systems, surge irrigation systems, drip irrigation systems, sediment basins, filter strips, polyacrylamide (PAM)

application, irrigation water management*, pest management, nutrient management, conservation tillage, and livestock grazing management.

It is recommended that landowners within the Weiser Flat Watershed contact the Weiser River Soil Conservation District (Weiser River SCD), Natural Resources Conservation Service (NRCS), or Idaho Association of Soil Conservation Districts (IASCD) to help determine the need to address water quality and other natural resource concerns on their land. This plan is not intended to identify which specific BMPs are appropriate for specific properties, but rather provides a watershed approach for addressing water quality problems attributed to runoff from agricultural lands.

Figure 2. Weiser Flat

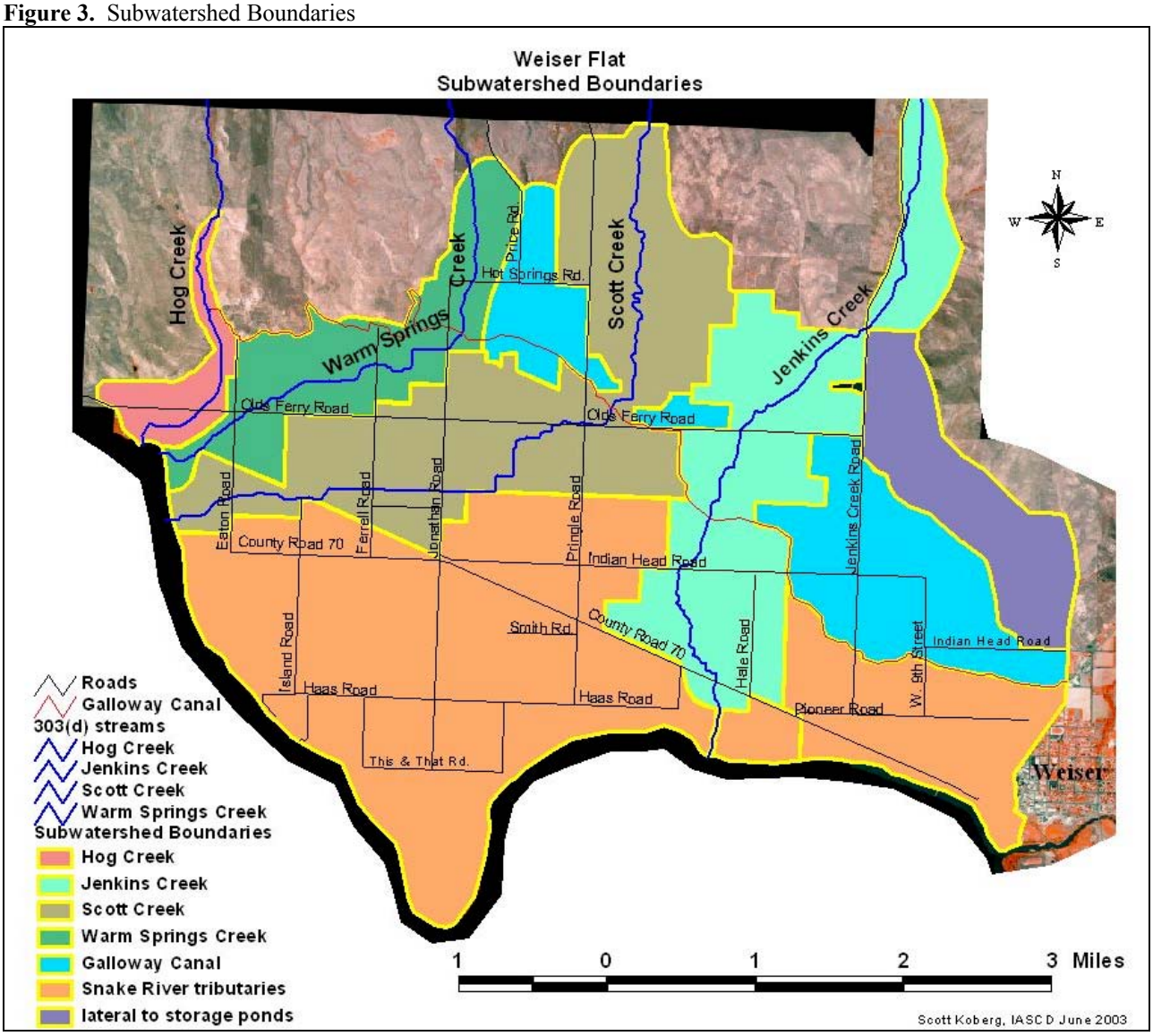


(* Irrigation Water Management (IWM) involves providing the correct amount of water at the correct times to optimize crop yield while reducing excess surface water runoff and deep percolation. Irrigation water management includes techniques to manage irrigation system hardware for peak uniformity and efficiency, as well as irrigation scheduling and soil moisture monitoring methods. Contact Weiser River SCD for additional information.)

2.0 Identification of Critical Acreage

An initial watershed inventory was completed to determine the land areas that affect water quality in Hog, Warm Springs, Scott, and Jenkins Creek as well as those land areas impacting the Snake River from other waterways and drains. Aerial photos, topographic maps, farm field digitization, and on-site field investigations to determine hydrologic patterns were utilized during the watershed inventory. During this process it was determined that the 6th Field HUC boundaries originally identified during the TMDL process did not reflect actual hydrologic patterns. In order to accurately identify the fields impacting each of the waterbodies in the Flat, new subwatershed boundaries were delineated (Figure 3).

Figure 3. Subwatershed Boundaries



In the Weiser Flat watershed, one farmer's wastewater often becomes another farmer's irrigation water. The accuracy in determining exactly where particular pollutants originate is compromised as distance from the water body of concern increases. Accordingly, critical areas closest to the mouth of the subwatersheds or adjacent to the tributaries themselves are considered highest priority for treatment due to the increased potential to directly impact surface water quality in the stream segments of concern.

In order to achieve the goals set forth in the TMDL Subbasin Assessment, land treatment through BMP installation will be pursued in three tiers. Agricultural land that drains directly into Hog, Warm Springs, Scott, and Jenkins Creek or directly to the Snake River is included in Tier 1. Tier 1 fields have the most immediate impact on water quality due to their proximity to a 303(d) listed stream segment. Unlike Tier 1 fields, Tier 2 fields are not directly adjacent to a 303(d) listed stream segment, and the wastewater from Tier 2 acreage has the potential to be reused by Tier 1 acreage before entering a 303(d) listed stream segment. Tier 3 fields are located in the uplands where wastewater has the potential to be used multiple times by Tier 2 and Tier 1 acreage before entering a stream segment of concern. In terms of BMP implementation Tier 1 is high priority, Tier 2 is medium priority, and Tier 3 is low priority (Figure 4).

Tier 1: Fields directly adjacent to the stream segment of concern (303d listed); or fields having a direct and substantial influence on the stream segment of concern

Tier 2: Fields in each subwatershed with an indirect, yet substantial influence on the stream segment of concern (303d listed); or fields with wastewater that has potential re-use before entering the stream segment of concern

Tier 3: Fields upland in each subwatershed that indirectly influence the stream segment of concern (303d listed); or fields that drain into irrigation supply canals and/or laterals within each subwatershed

These tiers only apply to surface irrigated cropland fields and do not include sprinkler irrigated agricultural land, pastureland, or CAFO and AFO units within the Weiser Flat watershed.

Table 2. Weiser Flat Watershed Agricultural Acreage

Treatment Unit	**Acres**	**Percentage of total ag. acres**
Tier 1: surface irrigated cropland	2220.7	21.5%
Tier 2: surface irrigated cropland	2630.6	25.5%
Tier 3: surface irrigated cropland	3058.9	29.7%
Irrigated pasture	988.4	9.6%
Sprinkler irrigated agricultural land	1408.7	13.7%
CAFO/AFO	8 units	N/A
TOTAL	**10,307.3 acres**	**100%**

Figure 4. Weiser Flat Critical Acreage

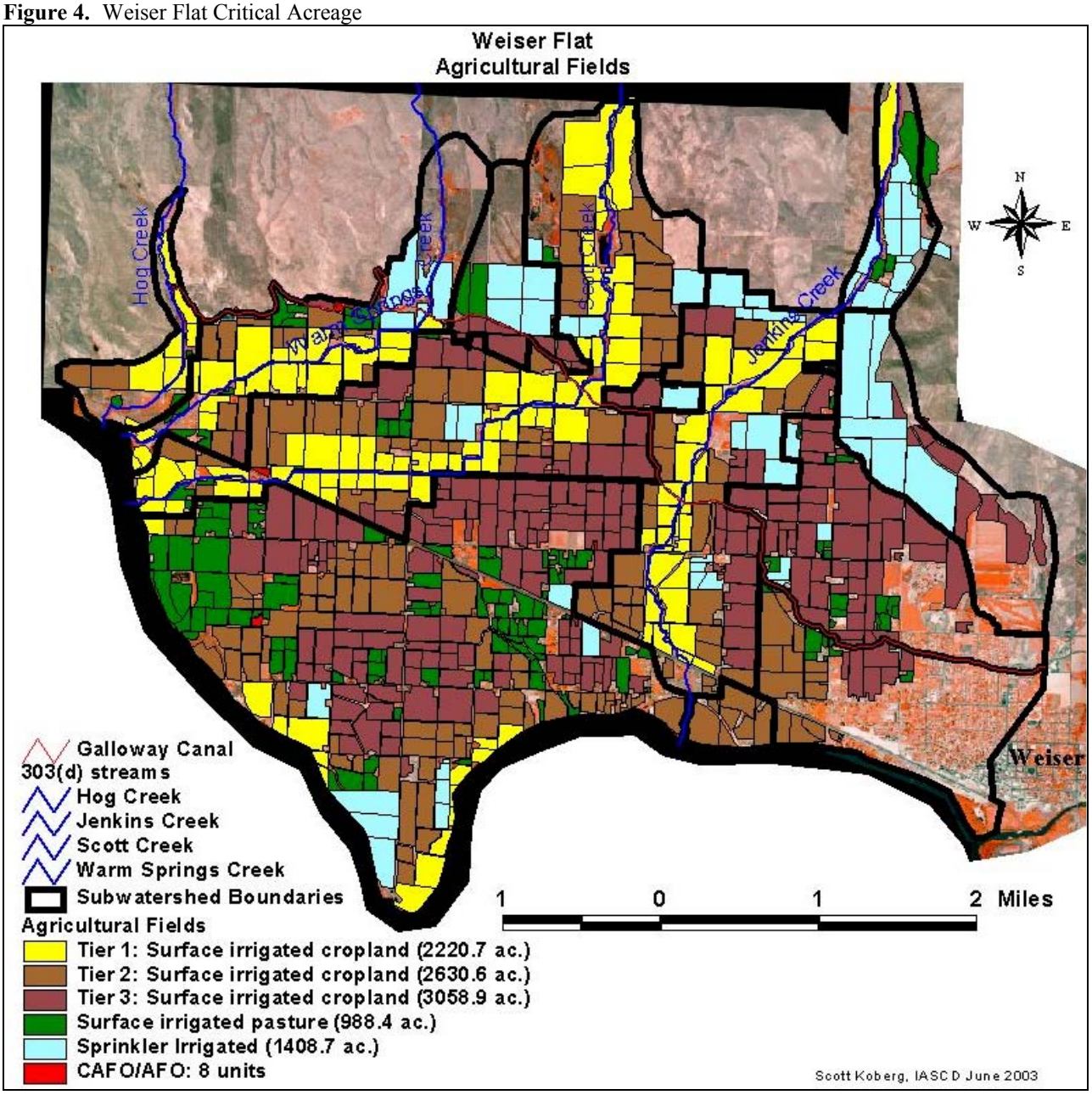


Table 3. 2003 Agricultural Data for Weiser Flat Watershed (Total)

Inventory: Farms & Cropland	Weiser Flat Watershed
Total # of Farms (FSA Tracts)	265
Total Acres of Farms	10,307.3
Average Farm Size (acres)	38.9
Total # of farm fields	735
Average farm field size (acres)	14.0

3.0 TMDL Objectives

The overall objective of the TMDL is to achieve water quality that will support appropriate designated uses for Hog, Warm Springs, Scott, and Jenkins Creek as well as the Lower Snake River. The TMDL recognizes that the targets and load reductions may be revised as additional data is collected, as understanding of water quality in the Weiser Flat improves, and as state water quality standards adapt to reflect new developments.

Agricultural sources of sediment, bacteria and nutrients include erosion from surface irrigated cropland and pastures, runoff from animal feedlots, livestock grazing on or near waterways, and erosion in drainage ditches resulting from continual maintenance**.** BMPs can be implemented to address the following:

- Irrigation induced erosion
- Irrigation tailwater delivery to receiving water bodies
- Lack of adequate vegetation adjacent to waterways necessary for reducing sediment, nutrients, and pathogens from runoff.
- Animal feedlots in and adjacent to waterways delivering excess sediment, nutrients, and bacteria.

4.0 Implementation Plan BMPs

Agricultural conservation and soil erosion practices are typically referred to as Best Management Practices (BMPs). These practices are nationally derived systems to control, reduce, or prevent soil erosion and sedimentation on agricultural land uses (APAP, 2003). BMPs are selected to reduce irrigation-induced and streambank erosion, contain and filter sediment, nutrients, and bacteria from irrigation wastewater, contain and properly dispose of animal wastes, and reduce leaching of nutrients and pesticides. Proper implementation of BMPs on agricultural fields within the Weiser Flat Watershed will improve the quality of surface water in the project area and reduce pollutant loading to the Snake River from the Weiser Flat.

BMPs include, but are not limited to, the following:

Table 4. Treatment Unit 1: Surface Irrigated Cropland

Agro-Tillage	Conservation Cropping Sequence
Conservation Tillage	Cover and Green Manure Crop
Filter Strips	Grassed Waterway
Surge Irrigation System	Sprinkler Irrigation System
Tailwater Recovery System	Irrigation Water Management Systems
Straw Mulching	Nutrient Management
Pest Management	Sediment Basin
Underground Outlet	Chiseling and Subsoiling
Waste Utilization	Channel Vegetation
Drip Irrigation System	PAM
Irrigation Water Conveyance	

Table 5. Treatment Unit 2: Surface Irrigated Pasture

Fencing	Stream channel stabilization
Heavy use area protection	Offsite watering
Filter strips	Waste Utilization
Spring water development	Waste Storage System
Irrigation systems	Nutrient Management
Pasture and Hayland Planting	Planned Grazing System
Livestock Watering Facility	Pasture and Hayland Management

Table 6. Treatment Unit 3: CAFO/AFO

Waste Management System	Heavy use area protection
Filter strips	Livestock Watering Facility
Nutrient Management	Fencing

4.1 Example Description of Alternatives for Surface Irrigated Cropland

Procedure: Conduct Resource Inventory and Site Assessment, Evaluate Data to Develop Site Specific BMP Alternatives.

SITE SPECIFIC BMP Alternative #1a ($1300/ acre)
Irrigation Water Mgt. Drip Irrigation System
Nutrient Mgt.
Conservation Crop Rotation

SITE SPECIFIC BMP Alternative #1b ($800/acre)
Irrigation Water Mgt. Sprinkler Irrigation System Nutrient Mgt. Conservation Crop Rotation

SITE SPECIFIC BMP Alternative #2 ($500/ acre)
Irrigation Water Mgt. Land Leveling Surface Irrigation System Gated Pipe Tail Water Recovery System Nutrient Mgt. Conservation Crop Rotation Conservation Tillage

SITE SPECIFIC BMP Alternative #3 ($250/ acre)
Irrigation Water Mgt. Concrete Ditch Filter Strip PAM Sediment Basin Nutrient Mgt. Conservation Crop Rotation Conservation Tillage

4.2 Example Description of Alternatives for Surface Irrigated Pasture

Procedure: Conduct Resource Inventory and Site Assessment, Evaluate Data to Develop Site Specific BMP Alternatives.

SITE SPECIFIC BMP Alternative #1 ($450/ acre)
Fencing Planned Grazing System Pasture & Hayland Mgt. Nutrient Mgt. Heavy Use Area Protection Livestock Watering Facility Irrigation Water Mgt. Field Border Irrigation System Gated Pipe

SITE SPECIFIC BMP Alternative #2 ($350/ acre)
Fencing Planned Grazing System Pasture & Hayland Mgt. Nutrient Mgt. Livestock Watering Facility Irrigation Water Mgt. Field Border Irrigation System

SITE SPECIFIC BMP Alternative #3 ($250/ acre)
Fencing Pasture & Hayland Mgt. Nutrient Mgt. Livestock Watering Facility Irrigation Water Mgt. Field Border Irrigation System

4.3 Example Description of Alternatives for CAFO/AFO

Procedure: Conduct Resource Inventory and Site Assessment, Evaluate Data to Develop Site Specific BMP Alternatives.

SITE SPECIFIC BMP Alternative #1 ($50,000/ each)
Nutrient Mgt. Heavy Use Area Protection Livestock Watering Facility Filter strips Waste Mgt. System Dike

SITE SPECIFIC BMP Alternative #2 ($35,000/ each)
Waste Mgt. System Nutrient Mgt. Livestock Watering Facility Filter strips Heavy Use Area Protection

SITE SPECIFIC BMP Alternative #3 ($25,000/ each)
Waste Mgt. System Nutrient Mgt. Filter strip Heavy Use Area Protection

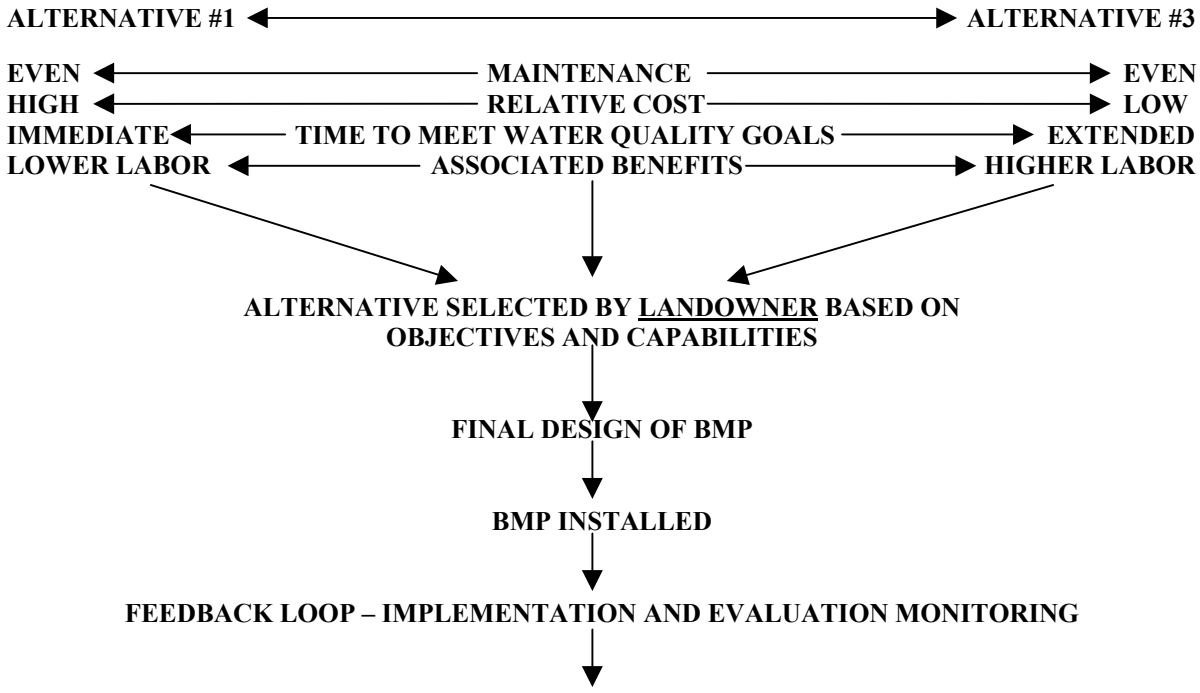
4.4 BMP Costs

Due to the variability in agriculture, these prices per acre are best professional judgment. With changes in technology, land ownership, crops, agricultural commodities, land use, and public perception, these costs and acres will change.

Lower cost BMPs are usually temporary in nature and do not address underlying issues relating to irrigation systems and irrigation water management. The yearly maintenance and labor cost of Alternative 3 BMPs are higher than those for Alternative 1 BMPs.

4.5 Graphic Comparison of BMP Selection and Implementation Process

The site specific BMP Alternative is chosen based on a variety of factors, but typically reflect the landowner's objectives in conjunction with the resource concerns identified by the assisting agency. The following flow chart provides a graphic representation of the selection process and some comparisons between Alternative #1 (high cost), Alternative #2 (moderate cost), and Alternative #3 (low cost) for the various treatment units. The chart applies to each of the three treatment units identified in section 4.0.



(APAP, 2003)

4.6 Feedback Loop

The feedback loop is a process used to evaluate and refine installed BMPs. Implementing the feedback loop to modify BMPs until water quality standards are met results in full voluntary compliance with the standards (APAP, 2002). The feedback loop occurs in four steps:

1. The process begins by developing water quality criteria to protect the identified beneficial uses of the water resource.
2. The existing water quality as compared to the water quality criteria established in Step 1, is the basis for developing or modifying BMPs.
3. The BMP is implemented on-site and evaluated for technical adequacy of design and installation.
4. The effectiveness of the BMP in achieving the criteria established in Step 1 is evaluated by comparison to water quality monitoring data. If the established criteria are achieved the BMP is

adequate as designed, installed, and maintained. If not, the BMP is modified and the process of the feedback loop continues.

5.0 Program of Implementation

The Weiser River Soil Conservation District has selected land treatment through application of a combination of BMPs including improved irrigation systems, nutrient and sediment control systems, and management practices. There are currently four active programs providing sources of funding for cost-share assistance within the Weiser Flat Watershed. The current sources of funding include the Environmental Quality Incentives Program (EQIP) administered by NRCS, a 319 Grant administered by IDEQ, a Water Quality Program for Agriculture (WQPA) cost-share project administered by ISCC, and a PL-566 Small Watershed project administered by NRCS. All sources of funding were applied for and secured by the Weiser River SCD to address identified surface and groundwater concerns near Weiser.

5.1 Installation and Financing

The USDA Natural Resources Conservation Service (NRCS) is the technical agency that will assist the Weiser River SCD in developing farm specific water quality plans and designs. BMPs will be installed according to standards and specifications contained in the NRCS Field Office Technical Guide. Where cost-share incentives are contracted through a state or federal program, NRCS and the Idaho Soil Conservation Commission (ISCC) will assist the Weiser River SCD with certification of installed BMPs, filing payment applications, completing annual status reviews on contracts, annual development of an average cost list, and provide any needed follow-up assistance required for contract modification.

Each participant will be responsible for installing the BMPs scheduled within their contract as planned in their Conservation Plan. Any needed land rights, easements, or permits necessary for construction and inspection will be the sole responsibility of the participant. Each participant will also be required to make their own arrangements for financing their share of installation costs.

Table 7. Estimated BMP Cost Summary for Treatment Unit 1, Tier 1 (Surface Irrigated Cropland: 2,221 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1a	$1300/AC	2221	$ 2,887,300
Alternative 1b	$800/AC	2221	$ 1,776,800
Alternative 2	$500/AC	2221	$ 1,110,500
Alternative 3	$250/AC	2221	$ 555,250

Table 8. Estimated BMP Cost Summary for Treatment Unit 1, Tier 2 (Surface Irrigated Cropland: 2,631 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1a	$1300/AC	2631	$ 3,420,300
Alternative 1b	$800/AC	2631	$ 2,104,800
Alternative 2	$500/AC	2631	$ 1,315,500
Alternative 3	$250/AC	2631	$ 657,750

Table 9. Estimated BMP Cost Summary for Treatment Unit 1, Tier 3 (Surface Irrigated Cropland: 3,059 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1a	$1300/AC	3059	$ 3,976,700
Alternative 1b	$800/AC	3059	$ 2,447,200
Alternative 2	$500/AC	3059	$ 1,529,500
Alternative 3	$250/AC	3059	$ 764,750

Table 10. Estimated BMP Cost Summary for Treatment Unit 2 (Surface Irrigated Pasture: 988 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1	$450/AC	988	$ 444,600
Alternative 2	$350/AC	988	$ 345,800
Alternative 3	$250/AC	988	$ 247,000

Table11. Estimated BMP Cost Summary for Treatment Unit 3 (CAFO/AFO 8 Units)

ALTERNATIVE		UNITS	TOTAL COSTS
Alternative 1	$50,000/each	8	$ 400,000
Alternative 2	$35,000/each	8	$ 280,000
Alternative 3	$25,000/each	8	$ 200,000

5.2 Operation, Maintenance, and Replacement

Participants who install BMPs in conjunction with a state or federal cost-share incentive program will be responsible for maintaining the installed BMPs for the life of their contract. The contract will outline the responsibility of the participant regarding operation and Maintenance (O&M) for each BMP. Participants who install BMPs on their own or without the benefit of a cost-share incentive program are not under contract to maintain the BMPs. If the BMPs are installed in response to a Conservation Plan completed with them by the assisting agencies, landowners are encouraged to maintain the BMPs and incorporate them into their annual operations. It is not required, however, unless they are under contract.

Inspections of BMPs installed in conjunction with a cost-share incentive program will be made on an annual basis by Weiser River SCD, the local NRCS office and the participant. The intent is to develop a system of BMPs that will protect water quality and is socially and economically feasible to the participant.

5.3 Existing Efforts

The Weiser Irrigation District currently has a number of wetlands systems under development along the Snake River within the Weiser Flat. The District has formed an agreement with the Weiser River Soil Conservation District, Idaho Department of Fish and Game, City of Weiser, Natural Resources Conservation Service, Idaho Power, Ducks Unlimited, and local landowners to construct and maintain pond/wetland systems in at least five different locations in the Weiser Flat. The purpose of the Irrigation District project is to "…help resolve water quality issues and restore some of the original wetland habitats along the Snake River" and to "…take advantage of the well-documented ability of wetland areas for allowing sediments to settle out before the water returns to the river and for the vegetation in the area to take up nitrogen, phosphorus and other nutrients." Also included in the project agreement is the following statement regarding monitoring: "From the standpoint of assuring that the water quality goals of the project are met, the City of Weiser, the Idaho Department of Environmental Quality and Idaho Power will provide monitoring support." Ongoing and planned locations for the constructed wetland systems include Galloway Canal at Hog Creek, Scott Creek near the Snake River, and Jenkins Creek near the Snake River.

5.4 Water Quality Monitoring

The Idaho State Department of Agriculture (ISDA) collected water quality samples in the Weiser Flat watershed from March 1999 through April 2001. Samples were collected twice per month during the irrigation season (April – October) and once per month during the winter (November – March). IDEQ has conducted BURP evaluations on three of the four creeks in the Flat (Hog, Scott, and Warm Springs) and has relied on ISDA water quality data to develop the Weiser Flat Subbasin Assessment. Data parameters measured thus far have included DO (dissolved oxygen), temperature, percent saturation, conductivity, TDS (total dissolved solids) pH, discharge (cfs), TSS (total suspended solids), TVS (total volatile solids), nitrate/nitrite, TP (total phosphorus), OP (dissolved ortho-phosphorus), fecal coliform, and E-coli.

ISDA along with the Weiser River SCD, local NRCS office, and the Idaho Association of Soil Conservation Districts (IASCD) will develop a water quality monitoring plan that will allow trend analysis of water quality and gauge progress toward meeting the TMDL load reductions. The proper time to revisit each subwatershed for evaluation of water quality improvements will be decided through joint agency cooperation, data review, and BMP implementation evaluation. This

could be based on a number of factors including percent of critical acres treated, number of major contributors treated, or a specific time interval.

6.0 Hog Creek Subwatershed

Critical areas closest to the mouth of Hog Creek near the Snake River or adjacent to the creek itself is considered highest priority for treatment due to the increased potential to directly impact surface water quality. Accordingly, the following is a general rule that applies to the prioritization of critical acres within each tributary subwatershed priority area:

Tier 1: Fields directly adjacent to the stream segment of concern (303d listed); or fields having a direct and substantial influence on the stream segment of concern

Tier 2: Fields in each subwatershed with an indirect, yet substantial influence on the stream segment of concern; or fields with wastewater that has potential re-use before entering the stream of concern

Tier 3: Fields upland in each subwatershed that indirectly influence the stream segment of concern; or fields that drain into irrigation supply canals and/or laterals within each subwatershed

These tiers only apply to surface irrigated cropland fields and do not include sprinkler irrigated agricultural land, pastureland, or CAFO and AFO units within the Weiser Flat watershed.

Table 12. Hog Creek Subwatershed Agricultural Acreage

Treatment Unit	Acres	Percentage of total ag. acres
Tier 1: surface irrigated cropland	113.9	66.2%
Tier 2: surface irrigated cropland	51.5	29.9%
Tier 3: surface irrigated cropland	0	0%
Irrigated pasture	6.7	3.9%
Sprinkler irrigated agricultural land	0	0%
CAFO/AFO	3 units	N/A
TOTAL	**172.1 acres**	**100%**

Table 13. 2003 Agricultural Data for Weiser Flat Watershed

Inventory: Farms & Cropland	Hog Creek Subwatershed
Total # of Tracts (FSA Tracts)	4
Total Acres of Farms	172.1
Average Farm Size (acres)	43.0
Total # of farm fields	12
Average farm field size	14.3

Figure 5. Hog Creek Subwatershed Critical Acreage

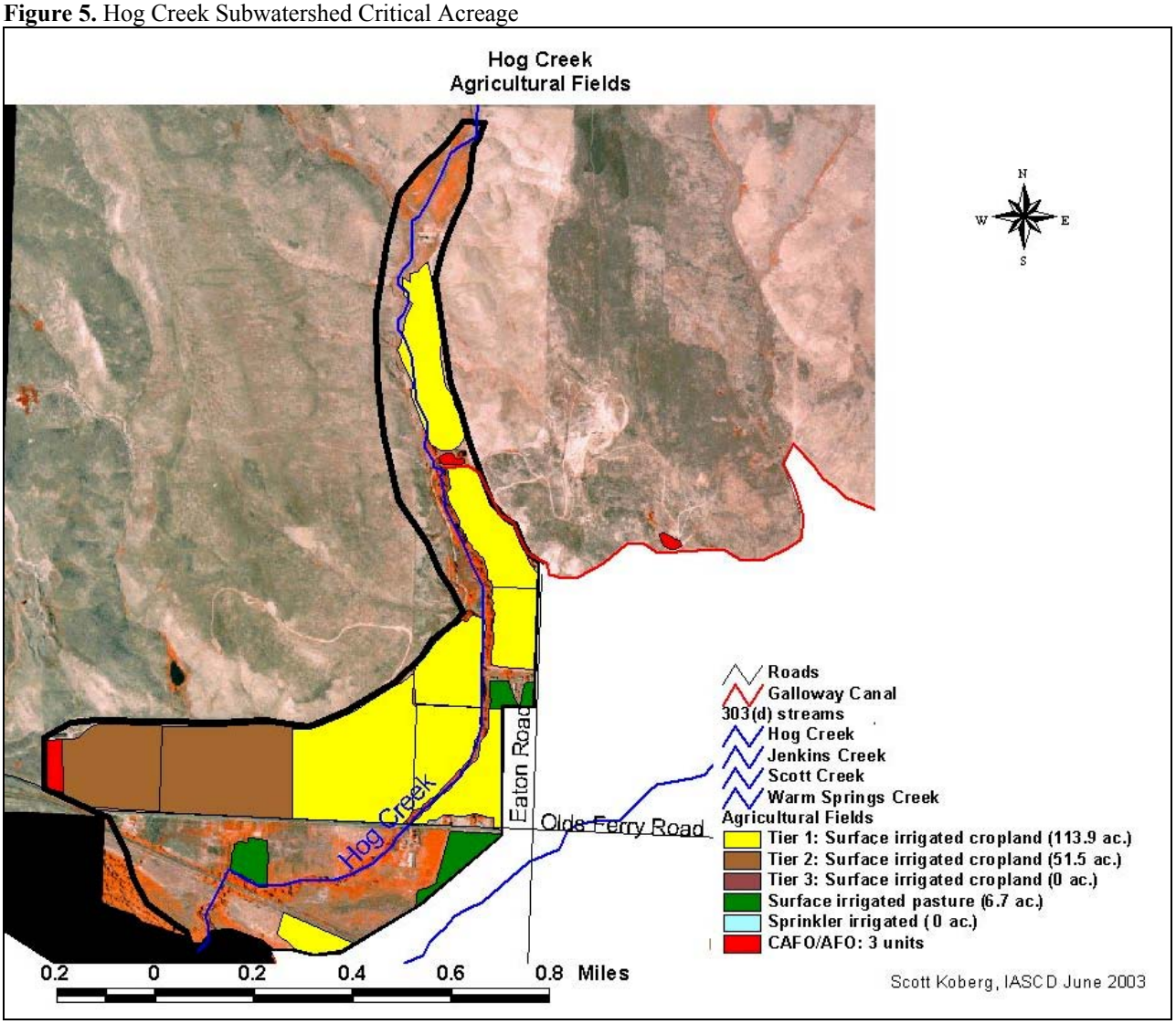


Table 14. Estimated BMP Cost Summary for Treatment Unit 1, Tier 1 (Surface Irrigated Cropland: 114 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1a	$1300/AC	114	$ 148,200
Alternative 1b	$800/AC	114	$ 91,200
Alternative 2	$500/AC	114	$ 57,000
Alternative 3	$250/AC	114	$ 28,500

Table 15. Estimated BMP Cost Summary for Treatment Unit 1, Tier 2 (Surface Irrigated Cropland: 52 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1a	$1300/AC	52	$ 67,600
Alternative 1b	$800/AC	52	$ 41,600
Alternative 2	$500/AC	52	$ 26,000
Alternative 3	$250/AC	52	$ 13,000

Table 16. Estimated BMP Cost Summary for Treatment Unit 2 (Surface Irrigated Pasture: 7 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1	$450/AC	7	$ 3,150
Alternative 2	$350/AC	7	$ 2,450
Alternative 3	$250/AC	7	$ 1,750

Table 17. Estimated BMP Cost Summary for Treatment Unit 4 (CAFO/AFO 3 Units)

ALTERNATIVE		UNITS	TOTAL COSTS
Alternative 1	$50,000/each	3	$ 150,000
Alternative 2	$35,000/each	3	$ 105,000
Alternative 3	$25,000/each	3	$ 75,000

7.0 Warm Springs Creek Subwatershed

Critical areas closest to the mouth of Warm Springs Creek near the Snake River or adjacent to the creek itself is considered highest priority for treatment due to the increased potential to directly impact surface water quality. Accordingly, the following is a general rule that applies to the prioritization of critical acres within each tributary subwatershed priority area:

Tier 1: Fields directly adjacent to the stream segment of concern (303d listed); or fields having a direct and substantial influence on the stream segment of concern

Tier 2: Fields in each subwatershed with an indirect, yet substantial influence on the stream segment of concern; or fields with wastewater that has potential re-use before entering the stream of concern

Tier 3: Fields upland in each subwatershed that indirectly influence the stream segment of concern; or fields that drain into irrigation supply canals and/or laterals within each subwatershed

These tiers only apply to surface irrigated cropland fields and do not include sprinkler irrigated agricultural land, pastureland, or CAFO and AFO units within the Weiser Flat watershed.

Table 18. Warm Springs Subwatershed Agricultural Acreage

Treatment Unit	Acres	Percentage of total ag. acres
Tier 1: surface irrigated cropland	363.2	49.5%
Tier 2: surface irrigated cropland	146.7	20.0%
Tier 3: surface irrigated cropland	29.4	4.0%
Irrigated pasture	78.1	10.7%
Sprinkler irrigated agricultural land	115.8	15.8%
CAFO/AFO	1 unit	N/A
TOTAL	**733.2 acres**	**100%**

Table19. 2003 Agricultural Data for Weiser Flat Watershed

Inventory: Farms & Cropland	Warm Springs Subwatershed
Total # of Tracts (FSA Tracts)	21

Total Acres of Farms	733.2
Average Farm Size (acres)	34.9
Total # of farm fields	57
Average farm field size	12.9

Figure 6. Warm Springs Creek Subwatershed Critical Acreage

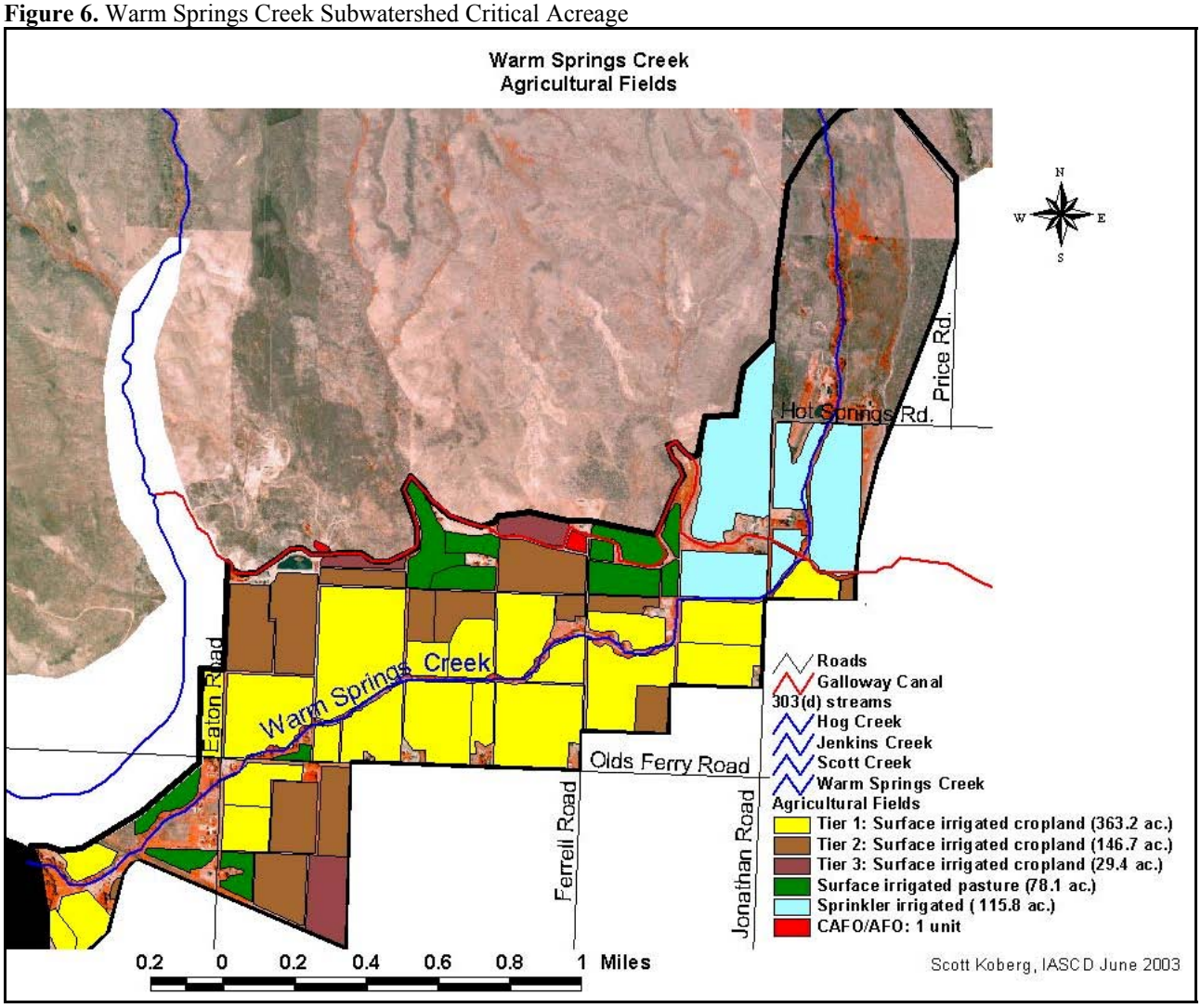


Table 20. Estimated BMP Cost Summary for Treatment Unit 1, Tier 1 (Surface Irrigated Cropland: 363 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1a	$1300/AC	363	$ 471,900
Alternative 1b	$800/AC	363	$ 290,400
Alternative 2	$500/AC	363	$ 181,500
Alternative 3	$250/AC	363	$ 90,750

Table 21. Estimated BMP Cost Summary for Treatment Unit 1, Tier 2 (Surface Irrigated Cropland: 147 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1a	$1300/AC	147	$ 191,100
Alternative 1b	$800/AC	147	$ 117,600
Alternative 2	$500/AC	147	$ 73,500
Alternative 3	$250/AC	147	$ 36,750

Table 22. Estimated BMP Cost Summary for Treatment Unit 1, Tier 3 (Surface Irrigated Cropland: 29 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1a	$1300/AC	29	$ 37,700
Alternative 1b	$800/AC	29	$ 23,200
Alternative 2	$500/AC	29	$ 14,500
Alternative 3	$250/AC	29	$ 7,250

Table 23. Estimated BMP Cost Summary for Treatment Unit 2 (Surface Irrigated Pasture: 78 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1	$450/AC	78	$ 35,100
Alternative 2	$350/AC	78	$ 27,300
Alternative 3	$250/AC	78	$ 19,500

Table 24. Estimated BMP Cost Summary for Treatment Unit 4 (CAFO/AFO 1 Unit)

ALTERNATIVE		UNITS	TOTAL COSTS
Alternative 1	$50,000/each	1	$ 50,000
Alternative 2	$35,000/each	1	$ 35,000
Alternative 3	$25,000/each	1	$ 25,000

8.0 Scott Creek Subwatershed

Critical areas closest to the mouth of Scott Creek near the Snake River or adjacent to the creek itself is considered highest priority for treatment due to the increased potential to directly impact surface water quality. Accordingly, the following is a general rule that applies to the prioritization of critical acres within each tributary subwatershed priority area:

Tier 1: Fields directly adjacent to the stream segment of concern (303d listed); or fields having a direct and substantial influence on the stream segment of concern

Tier 2: Fields in each subwatershed with an indirect, yet substantial influence on the stream segment of concern; or fields with wastewater that has potential re-use before entering the stream of concern

Tier 3: Fields upland in each subwatershed that indirectly influence the stream segment of concern; or fields that drain into irrigation supply canals and/or laterals within each subwatershed

These tiers only apply to surface irrigated cropland fields and do not include sprinkler irrigated agricultural land, pastureland, or CAFO and AFO units within the Weiser Flat watershed.

Table 25. Scott Creek Subwatershed Agricultural Acreage

Treatment Unit	Acres	Percentage of total ag. acres
Tier 1: surface irrigated cropland	969.6	43.3%
Tier 2: surface irrigated cropland	802.9	36.0%
Tier 3: surface irrigated cropland	296.4	13.2%
Irrigated pasture	49.5	2.2%
Sprinkler irrigated agricultural land	119.0	5.3%
CAFO/AFO	1 unit	N/A
TOTAL	**2237.4 acres**	**100%**

Table 26. 2003 Agricultural Data for Weiser Flat Watershed

Inventory: Farms & Cropland	Scott Creek Subwatershed
Total # of Tracts (FSA Tracts)	47
Total Acres of Farms	2237.4
Average Farm Size (acres)	47.6
Total # of farm fields	134
Average farm field size	16.7

Figure 7. Scott Creek Subwatershed Critical Acreage

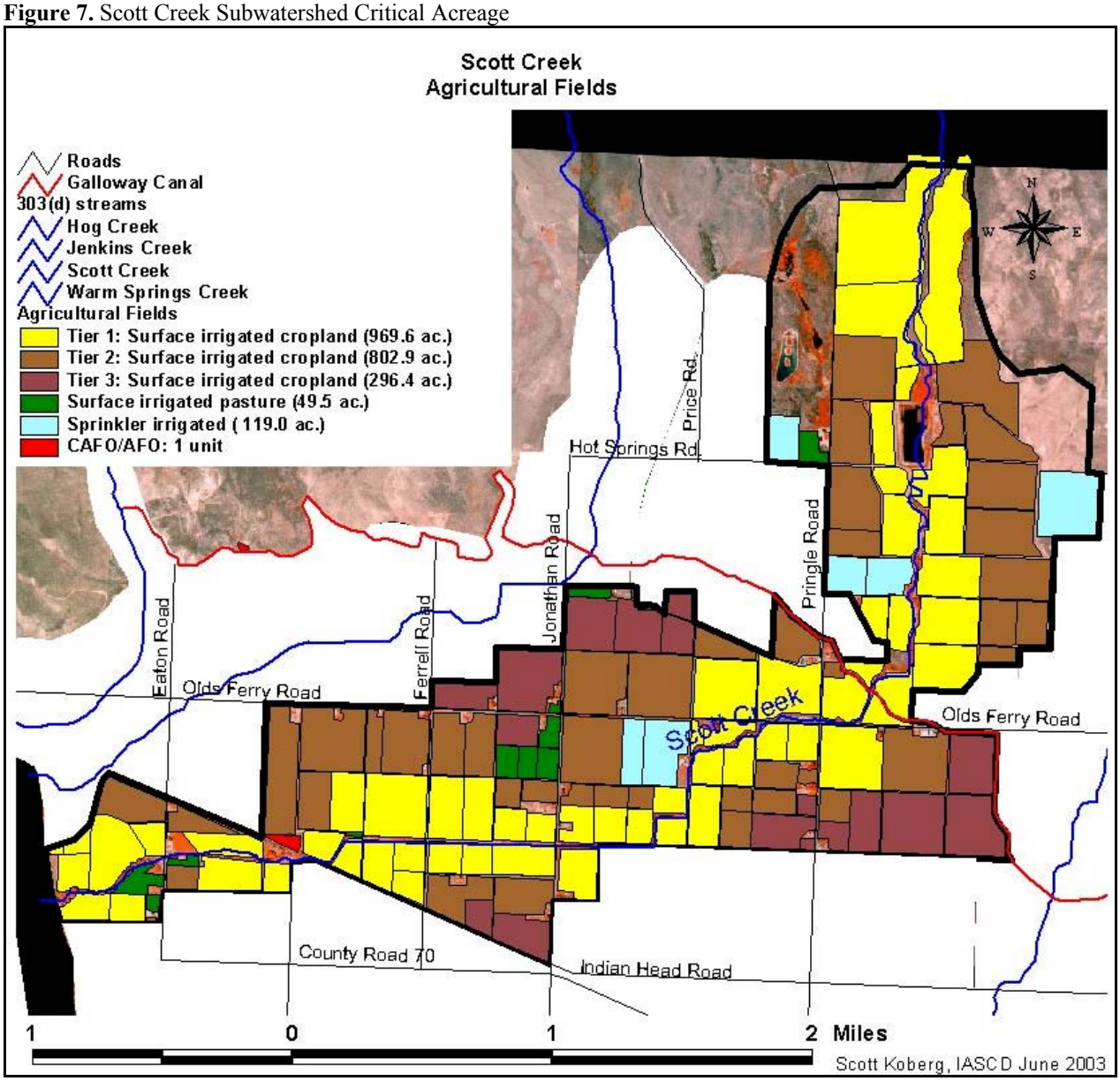


Table 27. Estimated BMP Cost Summary for Treatment Unit 1, Tier 1 (Surface Irrigated Cropland: 970 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1a	$1300/AC	970	$ 1,261,000
Alternative 1b	$800/AC	970	$ 776,000
Alternative 2	$500/AC	970	$ 485,000
Alternative 3	$250/AC	970	$ 242,500

Table 28. Estimated BMP Cost Summary for Treatment Unit 1, Tier 2 (Surface Irrigated Cropland: 803 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1a	$1300/AC	803	$ 1,043,900
Alternative 1b	$800/AC	803	$ 642,400
Alternative 2	$500/AC	803	$ 401,500
Alternative 3	$250/AC	803	$ 200,750

Table 29. Estimated BMP Cost Summary for Treatment Unit 1, Tier 3 (Surface Irrigated Cropland: 296 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1a	$1300/AC	296	$ 384,800
Alternative 1b	$800/AC	296	$ 236,800
Alternative 2	$500/AC	296	$ 148,000
Alternative 3	$250/AC	296	$ 74,000

Table 30. Estimated BMP Cost Summary for Treatment Unit 2 (Surface Irrigated Pasture: 50 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1	$450/AC	50	$ 22,500
Alternative 2	$350/AC	50	$ 17,500
Alternative 3	$250/AC	50	$ 12,500

Table 31. Estimated BMP Cost Summary for Treatment Unit 4 (CAFO/AFO 1 Unit)

ALTERNATIVE		UNITS	TOTAL COSTS
Alternative 1	$50,000/each	1	$ 50,000
Alternative 2	$35,000/each	1	$ 35,000
Alternative 3	$25,000/each	1	$ 25,000

9.0 Jenkins Creek Subwatershed

Critical areas closest to the mouth of Jenkins Creek near the Snake River or adjacent to the creek itself is considered highest priority for treatment due to the increased potential to directly impact surface water quality. Accordingly, the following is a general rule that applies to the prioritization of critical acres within each tributary subwatershed priority area:

Tier 1: Fields directly adjacent to the stream segment of concern (303d listed); or fields having a direct and substantial influence on the stream segment of concern

Tier 2: Fields in each subwatershed with an indirect, yet substantial influence on the stream segment of concern; or fields with wastewater that has potential re-use before entering the stream of concern

Tier 3: Fields upland in each subwatershed that indirectly influence the stream segment of concern; or fields that drain into irrigation supply canals and/or laterals within each subwatershed

These tiers only apply to surface irrigated cropland fields and do not include sprinkler irrigated agricultural land, pastureland, or CAFO and AFO units within the Weiser Flat watershed.

Table 32. Jenkins Creek Subwatershed Agricultural Acreage

Treatment Unit	Acres	Percentage of total ag. acres
Tier 1: surface irrigated cropland	553.2	31.5%
Tier 2: surface irrigated cropland	468.8	26.7%
Tier 3: surface irrigated cropland	284.6	16.2%
Irrigated pasture	66.2	3.8%
Sprinkler irrigated agricultural land	383.4	21.8%
CAFO/AFO	0 units	N/A
TOTAL	**1756.2 acres**	**100%**

Table 33. 2003 Agricultural Data for Weiser Flat Watershed

Inventory: Farms & Cropland	Jenkins Creek Subwatershed
Total # of Tracts (FSA Tracts)	29
Total Acres of Farms	1756.2
Average Farm Size (acres)	60.6
Total # of farm fields	112
Average farm field size	15.7

Figure 8. Jenkins Creek Subwatershed Critical Acreage

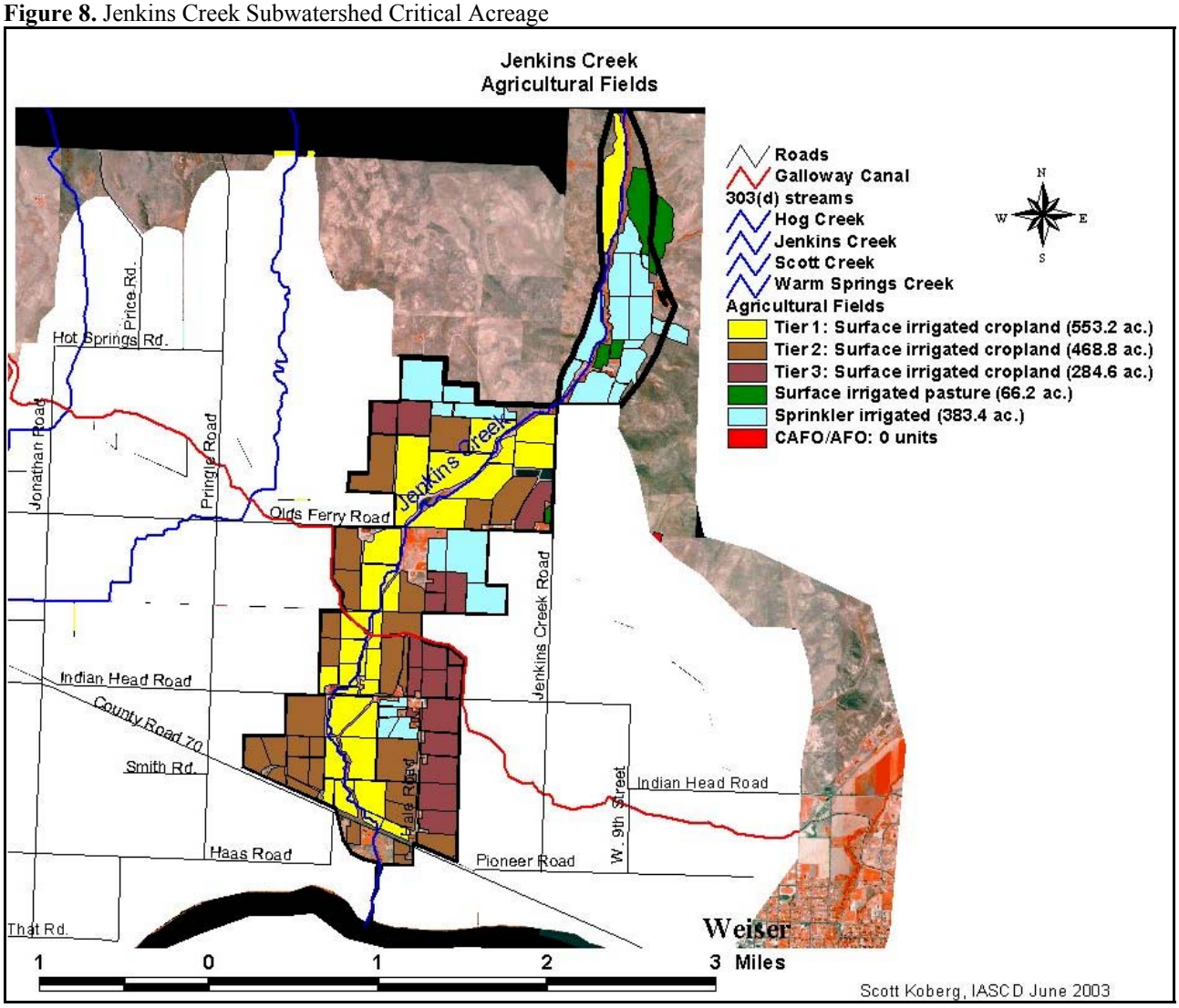


Table 34. Estimated BMP Cost Summary for Treatment Unit 1, Tier 1 (Surface Irrigated Cropland: 553 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1a	$1300/AC	553	$ 718,900
Alternative 1b	$800/AC	553	$ 442,400
Alternative 2	$500/AC	553	$ 276,500
Alternative 3	$250/AC	553	$ 138,250

Table 35. Estimated BMP Cost Summary for Treatment Unit 1, Tier 2 (Surface Irrigated Cropland: 469 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1a	$1300/AC	469	$ 609,700
Alternative 1b	$800/AC	469	$ 375,200
Alternative 2	$500/AC	469	$ 234,500
Alternative 3	$250/AC	469	$ 117,250

Table 36. Estimated BMP Cost Summary for Treatment Unit 1, Tier 3 (Surface Irrigated Cropland: 285 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1a	$1300/AC	285	$ 370,500
Alternative 1b	$800/AC	285	$ 228,000
Alternative 2	$500/AC	285	$ 142,500
Alternative 3	$250/AC	285	$ 71,250

Table 37. Estimated BMP Cost Summary for Treatment Unit 2 (Surface Irrigated Pasture: 66 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1	$450/AC	66	$ 29,700
Alternative 2	$350/AC	66	$ 23,100
Alternative 3	$250/AC	66	$ 16,500

10.0 Snake River Tributaries Subwatershed

Critical areas closest to the mouths of other tributaries in the Flat or directly adjacent to the Snake River itself are considered highest priority for treatment due to the increased potential to directly impact surface water quality. Accordingly, the following is a general rule that applies to the prioritization of critical acres within each tributary subwatershed priority area:

Tier 1: Fields directly adjacent to the stream segment of concern (303d listed); or fields having a direct and substantial influence on the stream segment of concern

Tier 2: Fields in each subwatershed with an indirect, yet substantial influence on the stream segment of concern; or fields with wastewater that has potential re-use before entering the stream of concern

Tier 3: Fields upland in each subwatershed that indirectly influence the stream segment of concern; or fields that drain into irrigation supply canals and/or laterals within each subwatershed

These tiers only apply to surface irrigated cropland fields and do not include sprinkler irrigated agricultural land, pastureland, or CAFO and AFO units within the Weiser Flat watershed.

Table 38. Snake River Tributaries Subwatershed Agricultural Acreage

Treatment Unit	Acres	Percentage of total ag. acres
Tier 1: surface irrigated cropland	220.8	5.8%
Tier 2: surface irrigated cropland	1160.7	30.7%
Tier 3: surface irrigated cropland	1522.6	40.2%
Irrigated pasture	680.7	18.0%
Sprinkler irrigated agricultural land	201.9	5.3%
CAFO/AFO	2 units	N/A
TOTAL	**3786.7 acres**	**100%**

Table 39. 2003 Agricultural Data for Weiser Flat Watershed

Inventory: Farms & Cropland	Snake River Tributaries Subwatershed
Total # of Tracts (FSA Tracts)	143
Total Acres of Farms	3786.7
Average Farm Size (acres)	26.5
Total # of farm fields	326
Average farm field size	11.6

Figure 9. Snake River Tributaries Subwatershed Critical Acreage

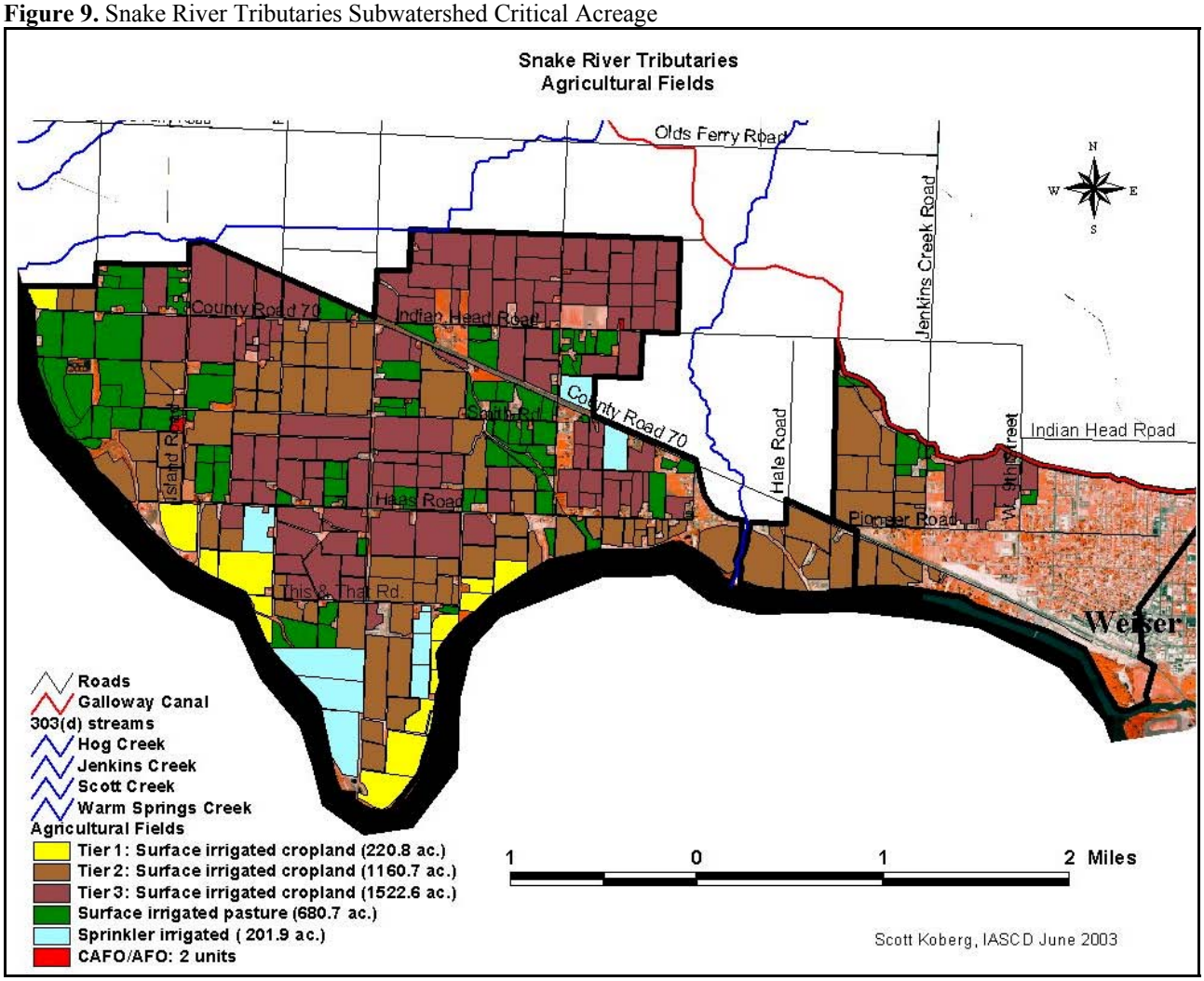


Table 40. Estimated BMP Cost Summary for Treatment Unit 1, Tier 1 (Surface Irrigated Cropland: 221 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1a	$1300/AC	221	$ 287,300
Alternative 1b	$800/AC	221	$ 176,800
Alternative 2	$500/AC	221	$ 110,500
Alternative 3	$250/AC	221	$ 55,250

Table 41. Estimated BMP Cost Summary for Treatment Unit 1, Tier 2 (Surface Irrigated Cropland: 1,161 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1a	$1300/AC	1161	$ 1,509,300
Alternative 1b	$800/AC	1161	$ 928,800
Alternative 2	$500/AC	1161	$ 580,500
Alternative 3	$250/AC	1161	$ 290,250

Table 42. Estimated BMP Cost Summary for Treatment Unit 1, Tier 3 (Surface Irrigated Cropland: 1,523 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1a	$1300/AC	1523	$ 1,979,900
Alternative 1b	$800/AC	1523	$ 1,218,400
Alternative 2	$500/AC	1523	$ 761,500
Alternative 3	$250/AC	1523	$ 380,750

Table 43. Estimated BMP Cost Summary for Treatment Unit 2 (Surface Irrigated Pasture: 681 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1	$450/AC	681	$ 306,450
Alternative 2	$350/AC	681	$ 238,350
Alternative 3	$250/AC	681	$ 170,250

Table 44. Estimated BMP Cost Summary for Treatment Unit 4 (CAFO/AFO 2 Units)

ALTERNATIVE		UNITS	TOTAL COSTS
Alternative 1	$50,000/each	2	$ 100,000
Alternative 2	$35,000/each	2	$ 70,000
Alternative 3	$25,000/each	2	$ 50,000

11.0 Galloway Canal Subwatershed

Critical areas adjacent to the Galloway Canal are considered highest priority for treatment due to the increased potential to directly impact surface water quality. However, since all wastewater from acreage within the Galloway Canal subwatershed is re-used once it reaches the canal, all surface irrigated land within the subwatershed is categorized as Tier 3 according to the following description:

Tier 3: Fields upland in each subwatershed that indirectly influence the stream segment of concern; or fields that drain into irrigation supply canals and/or laterals within each subwatershed

This tier categorization only applies to surface irrigated cropland fields and does not include sprinkler irrigated agricultural land, pastureland, or CAFO and AFO units within the Galloway Canal subwatershed.

Table 45. Galloway Canal Subwatershed Agricultural Acreage

Treatment Unit	Acres	Percentage of total ag. acres
Tier 1: surface irrigated cropland	0	0%
Tier 2: surface irrigated cropland	0	0%
Tier 3: surface irrigated cropland	802.7	71.4%
Irrigated pasture	107.2	9.5 %
Sprinkler irrigated agricultural land	214.5	19.1%
CAFO/AFO	0 units	N/A
TOTAL	**1124.4 acres**	**100%**

Table 46. 2003 Agricultural Data for Weiser Flat Watershed

Inventory: Farms & Cropland	Galloway Canal Subwatershed
Total # of Tracts (FSA Tracts)	3
Total Acres of Farms	1124.4
Average Farm Size (acres)	34.1
Total # of farm fields	80
Average farm field size	14.1

Figure 10. Galloway Canal Subwatershed Critical Acreage

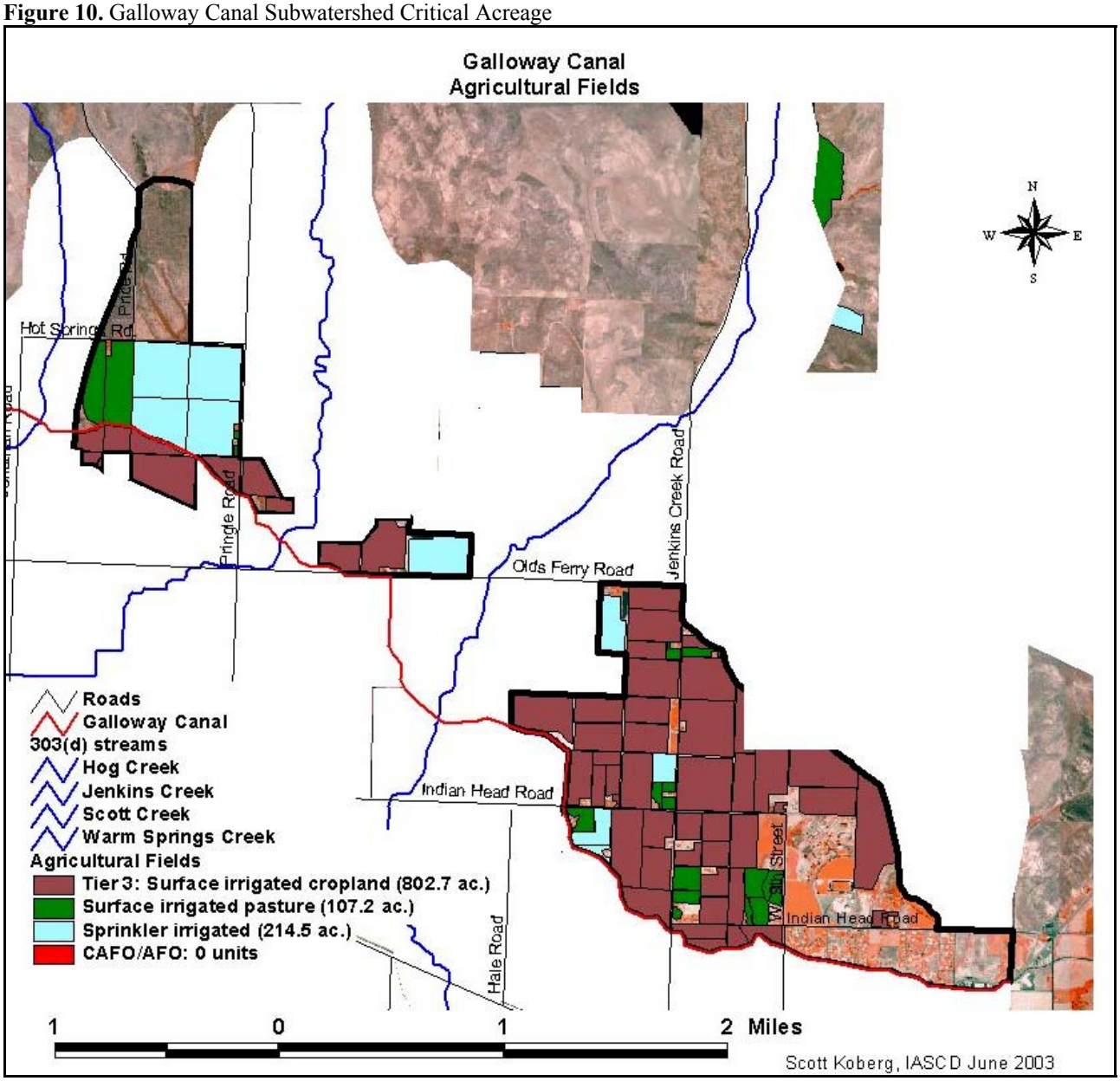


Table 47. Estimated BMP Cost Summary for Treatment Unit 1, Tier 3 (Surface Irrigated Cropland: 803 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1a	$1300/AC	803	$ 642,400
Alternative 1b	$800/AC	803	$ 642,400
Alternative 2	$500/AC	803	$ 401,500
Alternative 3	$250/AC	803	$ 200,750

Table 48. Estimated BMP Cost Summary for Treatment Unit 2 (Surface Irrigated Pasture: 107 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1	$450/AC	107	$ 48,150
Alternative 2	$350/AC	107	$ 37,450
Alternative 3	$250/AC	107	$ 26,750

12.0 Storage Ponds Subwatershed

Since all wastewater from acreage within the Storage Ponds subwatershed drains into the two irrigation storage ponds on Jenkins Creek Road north of Olds Ferry Road, all surface irrigated land within the subwatershed is categorized as Tier 3 according to the following description:

Tier 3: Fields upland in each subwatershed that indirectly influence the stream segment of concern; or fields that drain into irrigation supply canals and/or laterals within each subwatershed

This tier categorization only applies to surface irrigated cropland fields and does not include sprinkler irrigated agricultural land, pastureland, or CAFO and AFO units within the Storage Ponds subwatershed.

Table 49. Storage Ponds Subwatershed Agricultural Acreage

Treatment Unit	Acres	Percentage of total ag. acres
Tier 1: surface irrigated cropland	0	0%
Tier 2: surface irrigated cropland	0	0%
Tier 3: surface irrigated cropland	123.2	24.8%
Irrigated pasture	0	0%
Sprinkler irrigated agricultural land	374.1	75.2%
CAFO/AFO	1 unit	N/A
TOTAL	**497.3 acres**	**100%**

Table 50. 2003 Agricultural Data for Weiser Flat Watershed

Inventory: Farms & Cropland	Storage Ponds Subwatershed
Total # of Tracts (FSA Tracts)	6
Total Acres of Farms	497.3
Average Farm Size (acres)	82.9
Total # of farm fields	14
Average farm field size	35.5

Figure 11. Storage Ponds Subwatershed Critical Acreage

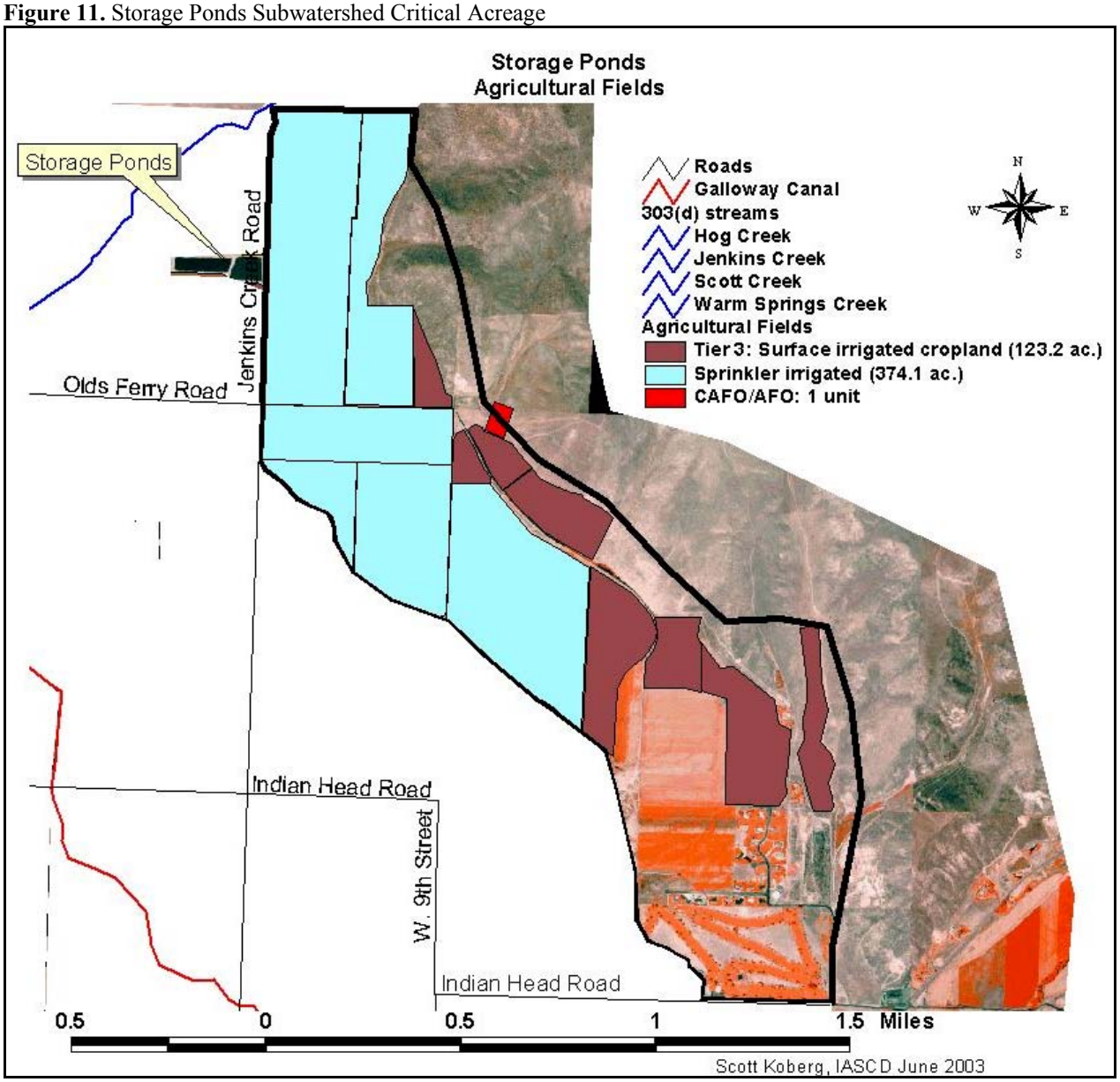


Table 51. Estimated BMP Cost Summary for Treatment Unit 1, Tier 3 (Surface Irrigated Cropland: 123 acres)

ALTERNATIVE		ACRES	TOTAL COSTS
Alternative 1a	$1300/AC	123	$ 98,400
Alternative 1b	$800/AC	123	$ 98,400
Alternative 2	$500/AC	123	$ 61,500
Alternative 3	$250/AC	123	$ 30,750

Table 52. Estimated BMP Cost Summary for Treatment Unit 4 (CAFO/AFO 1 Unit)

ALTERNATIVE		UNITS	TOTAL COSTS
Alternative 1	$50,000/each	1	$ 50,000
Alternative 2	$35,000/each	1	$ 35,000
Alternative 3	$25,000/each	1	$ 25,000