BULLY CREEK WATERSHED
ASSESSMENT AND STRATEGY

MALHEUR COUNTY, OREGON

PREPARED BY:

BULLY CREEK WATERSHED COALITION, INC.
MALHEUR SOIL AND WATER CONSERVATION DISTRICT
U.S. BUREAU OF LAND MANAGEMENT
U.S. NATURAL RESOURCES CONSERVATION SERVICE
OREGON DEPARTMENT OF FISH AND WILDLIFE
OREGON STATE UNIVERSITY MALHEUR EXTENSION SERVICE
U.S. BUREAU OF RECLAMATION

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For more information about this action strategy, contact:

Malheur County Soil and Water Conservation District
2925 SW 6th Avenue, Suite 2
Ontario, Oregon 97914
Phone — 541-889-2588
Fax — 541-889-4304

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VISION STATEMENT

The members of the Bully Creek Watershed Coalition have set as our mission the implementation of this long-range plan for the public and private lands within the subbasin.

We will utilize best management practices, technology, and research, working with individuals, agencies, and organizations, in order to re-establish and sustain a balanced ecosystem.

By accomplishing this, we will achieve our mission to enhance the resource base of the Bully Creek subbasin for us and those who will follow.

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CHAPTER 1.
INTRODUCTION

The Bully Creek watershed action strategy is a collection of recommendations from Bully Creek ranchers legally incorporated as Bully Creek Watershed Coalition, Inc. (Bully Creek Coalition), a non-profit educational organization. The plan has been developed with the advice and participation of the Malheur County Soil and Water Conservation District (SWCD), local, State, and Federal agencies, and concerned local citizens.

This watershed strategy integrates all aspect of the subbasin so it views the total system. Historically, natural resource plans have addressed a single problem or only one resource. Coalition members are committed to carrying out this plan, voluntarily, over a period of decades. The plan will emphasize "preventive maintenance" instead of after-the-fact clean-up. It is the road map to guide private landowners and public-land managers in their efforts to preserve the natural and community resources of the Bully Creek subbasin in an economically reasonable manner for all citizens. Implementing the plan will make it possible for public and private land ownerships to achieve improvements of *contiguous* habitats.

The Bully Creek watershed action strategy is unusual in that it was initiated by ranchers and citizens living in or having an interest in the subbasin. Because it was locally initiated, the probability that the objectives and recommendations will be implemented is high. Since there are many ways to address land use problems, a list of practices has been developed that will enable a landowner to choose solutions that best serve the individual and basin's needs.

The watershed action strategy is flexible and will be updated as new information and practices become available. Implementation will take place as projects are developed and funding is secured. A monitoring plan would be developed that would generate information as to the effectiveness of the implementation measures.

Today, many Government and regulatory-driven programs focus on a single problem in the subbasin. However, these often conflict with one another because they neither address the complexities of a natural watershed system nor the interactions of community needs. This plan begins the process of finding solutions to such overlaps and conflicts while considering all stakeholders interests. No amount of Government funding or regulation can equal the effects of broad voluntary participation on the part of individuals in their efforts to provide long-term protection of the subbasin's natural resource system.

The companion volume for this watershed action strategy — the appendix — contains material that is related to the subjects and issues presented here, but in a more technical manner. A glossary is included in the appendix.

CHAPTER 2.
PURPOSE AND GOALS

The *purpose* of the Bully Creek Coalition is to demonstrate that coordinated resource management by local landowners, local, State, and Federal agencies, and public interest groups can enhance the resource base of the Bully Creek watersheds and demonstrate the compatibility of their mutual goals.

The *overall goal* of the Bully Creek watershed action strategy is to promote improvement of contiguous habitat, touching or connected throughout in an unbroken sequence. This will provide a unified approach to issues of wildlife habitat and riparian and upland vegetation.

Following are *common goals* shared by all interests:

Goal 1. Achieve stable-to-improved trends in range conditions.

Goal 2. Achieve proper functioning conditions (PFC) on all streams.

Goal 3. Improve stream flows.

Goal 4. Improve water quality.

Goal 5. Implement and maintain Best Management Practices (BMP's).

Early in their process, the Bully Creek Coalition had a series of meeting to develop their goals. They included agency personnel in those meetings and asked the agencies to develop their own goal statements. Goals specific to the various entities are listed below, followed by a listing of their shared goals. The numbers in parentheses in the lists of agency goals relate to the list of Bully Creek Coalition goals.

A. BULLY CREEK COALITION GOALS

1. Utilize the grazing resource to its maximum potential at sustainable levels which allow optimal stock rates.
2. Maximize the resource potential of the watersheds.
3. Positively impact and stabilize the riparian area and stream flow while maximizing water quality and quantity potential.
4. Implement "best management practices" (BMP's) from ranch unit plans that are economically viable and sustainable.
5. Obtain corporate, non-profit status to receive and administer financial and technical assistance.
6. Collaboratively support projects that are considerate of community needs.
7. Ranch unit plans and projects meet the objectives of its land managers and assisting agencies.

B. U.S. BUREAU OF LAND MANAGEMENT (BLM) GOALS

- Improve ecological condition in early and middle seral stage areas that retain native perennial vegetative species and have the potential for improvement. *(2)*
- Maintain late ecological conditions (late seral stage) and potential natural communities where they currently exist. These vegetative communities are either near or at their potential in perms of kinds, amounts, and numbers of plants species which are expected to occupy their respective sites in undisturbed situations. *(2)*
- Maintain or improve seedlings to excellent condition. *(1,2)*
- Keep out or reduce the potential of new noxious weed invaders. Contain or reduce populations of existing noxious weeds. *(2)*
- Provide forage for livestock on a sustained basis. *(1)*
- Manage Wilderness Study Areas in accordance with the *Interim Management Policy and Guidelines for lands under Wilderness Review. (7)*
- Provide for high-quality dispersed recreation opportunities. *(6)*
- At a minimum, achieve "proper functioning condition" on all intermittent and perennial streams. *(3)*
- Maintain or increase populations and habitat for special status plants and/or animals. *(2)*
- Protect soil productivity. *(2)*
- Maintain or improve wildlife habitat and diversity. *(2)*
- Provide access to BLM-administered lands. *(2,6)*
- Maintain existing range improvement projects in usable condition in accordance with the BLM maintenance policy. *(1,2,7)*

C. OREGON DEPARTMENT OF FISH AND WILDLIFE (ODFW) GOALS AND OBJECTIVES

- Improve relations and information flow between ODFW and the landowners in the watersheds. *(6,7)*
- Improve aquatic habitat conditions so that tall native aquatic species are ensured long-term existence within the Bully Creek watersheds. *(3)*
- Increase the amount of streamside woody vegetation. *(3)*
  - Woody vegetation will provide additional shade to the stream. The additional shade will keep the water temperatures from getting as warm in the summer and keep water temperatures from getting as cold in the winter.
  - Additional woody vegetation will help to stabilize the stream banks and reduce sedimentation.
- Determine elk movement patterns. *(7)*
  - Determine the value of private lands to elk.
  - Look for opportunities to increase elk harvest rates.
  - Reduce the impact of elk to private property.
- Maintain or improve the condition of big game habitat. *(2)*
  - Increase the amount and distribution of browse species (bitterbrush, four-wing saltbrush, mahogany, willows, and aspens) for big game.
  - Enhance habitat conditions on public land to attract big game off private land.
- Maintain or improve the condition of upland gamebird habitat. *(2)*
  - Protect or enhance sage grouse leks (courtship areas) and brood habitat.
  - Improve riparian habitat for quail.
  - Protect or enhance condition of seeps and springs.
- Maintain or improve wildlife diversity. *(2,6,7)*
  - Raptors
  - Nongame birds and mammals
  - Reptiles and amphibians
  - Sensitive species

D. OBJECTIVES OF THE U.S. NATURAL RESOURCES CONSERVATION SERVICE

To assist with the identification, selection, and application of watershed enhancement:

- Assist the Coalition and its partners in identifying areas in which the health of the watersheds could be improved. *(4,7)*
- Provide guidance and assistance in identifying Coalition goals and methods for improving watershed health. *(4,7)*
- Provide technical assistance using U.S. Natural Resource Conservation Service (NRCS) standards and specifications in the design and application of tools that accomplish the Coalition goals. The NRCS focus will be:
  - Soils information, soil mapping, soil interpretations, range site soil correlation;
  - Ranch planning, sagebrush treatment, juniper management, livestock management tools, i.e., fencing, water development for wildlife as well as livestock, stream and riparian enhancement; *(2,3,4,7)*
  - Development of a water quality monitoring plan that will identify water quality problems and assess the effectiveness of management and structural practices to solve the problem. Assist the Coalition with collecting, analyzing, and interpreting water quality samples taken within the watersheds. *(3,4,7)*

E. COMMON GOALS

Discussion of the goals held by the various entities led to the development of a list of common goals. The Bully Creek Coalition and their partners have decided to put their initial focus on these goals, and develop their watershed strategy around achieving them.

The following are *common goals* shared by all interests:

Goal 1. Achieve stable-to-improved trend in range conditions.

Goal 2. Achieve proper functioning conditions (PFC) on all streams.
Riparian-wetland areas with adequate vegetation, landform, or large woody debris present to:

- dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality;
- filter sediment, capture bedload, and aid floodplain development;
- improve flood-water retention and ground-water recharge;
- develop root masses that stabilize streambanks against cutting action;
- develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses;
- support greater biodiversity.

Goal 3. Improve stream flows.

Goal 4. Improve water quality.

Goal 5. Implement and maintain Best Management Practices (BMP's).

CHAPTER 3.
BULLY CREEK SUBBASIN

A. LOCATION

The Bully Creek subbasin is located approximately 25 miles west of Ontario, Oregon. The subbasin is bounded on the north by the city of Ironside, on the west by Agency Valley Dam–Beulah Reservoir, on the south by the Malheur River, and on the east by the town of Vale. Within the subbasin are five watersheds: Upper Bully Creek, Lower Bully Creek (including Dry Creek), Clover Creek, Indian Creek, and Cottonwood Creek.

The five creeks and their tributaries deliver between 4,000 and 21,000 acre-feet of water annually to Bully Creek Reservoir for irrigation and recreational use. The reservoir has an active capacity of 30,000 acre-feet. The dam was constructed by the U.S. Bureau of Reclamation (Reclamation) and is operated by the Vale Oregon Irrigation District.

A wide range of wildlife exists in the Bully Creek subbasin; about 230 species of fish, amphibians, and vertebrates. Except for the bald eagle, there are no other known threatened or endangered wildlife species. Since the completion of the downstream dams, there is no known evidence of anadromous fish use.

Upland and big game hunting are the most popular dispersed recreational activities on public lands in the subbasin; the only developed recreation facilities are at Bully Creek Reservoir. The Beaver Creek Wilderness Study Area, in the Upper Bully Creek Watershed is being managed under BLM's Wilderness Review Program.

There are 25 BLM grazing allotments wholly or partially located within the subbasin. The BLM has jurisdiction over almost two thirds of the land and the private sector owns about one-third. Malheur County has the largest beef-cow population in the state, and the Bully Creek subbasin accounts for about 15 percent of the industry's total sales in the county — about $7.9 million in 1994.

B. GEOLOGY

Bully Creek subbasin is predominantly sediments and basalts. Lower Pliocene sediments are found in the areas surrounding Bully Creek proper and the lower reaches of its tributaries (Clover, Indian, upper Cottonwood, Red, and Dry Creeks). These include tuff, tuffaceous siltstone, sandstone, conglomerate, and diatomite with occasional basalt flows. Igneous material, primarily Miocene basalts, are found in the areas drained by the upper reaches of Bully Creek and its tributaries. There is a small area of alluvial deposits in the immediate vicinity of Westfall.

C. SOILS

Soils in the Bully Creek subbasin are typical of those formed under grasslands in arid environments: generally shallow, rocky, and droughty with varying thicknesses of dark colored surface horizons. These soils may be classified as aridisols, mollisols, or entisols depending upon landscape position. Entisols are on steep erodible badlands and flat-lying, frequently flooded areas. Aridisols are on the warmest landscape positions. Mollisols occur where moisture is favorable for plant growth. On north slopes at higher elevations, soils tend to be deeper and have thicker surface horizons which are organically rich and productive.

Temperature regimes are generally frigid, with warmer portions of the landscape characterized by a moderate amount of moisture. The moisture regime is xeric: moist, cool winters and warm, dry summers, much like a Mediterranean climate.

Parent materials are of two general types: lacustrine sedimentary deposits and volcanic rocks. The lacustrine sedimentary rocks are of the Bully Creek Formation (upper Miocene). The rocks are water-laid tuff, volcanic ash, tuffaceous clay, diatomite, sandstone, siltstone, and mud-flow deposits. Soils formed from these deposits tend to be fine-textured, have clay rich subsoils, and are highly erosive. Lacustrine breaks or badlands are common.

The volcanic rocks include basalt, rhyolite, andesite, dacite, and ash flow tuffs. Soils formed from these durable rocks tend to be loamy-textured, shallow to bedrock, and have high rock content. Appendix 1 contains a description of the soil units of the Upper Bully Creek watershed. A listing of the acreage of the soil types in the subbasin will be added when available.

D. HYDROLOGY

Bully Creek is a tributary of the Malheur River, which lies within the Snake River basin. The subbasin is comprised of five watersheds, each named after its primary creek. Four of these creeks — Upper Bully, Clover, Indian, and Cottonwood — converge near Westfall, forming Lower Bully Creek, which is the main stem. Below Westfall, two lesser water courses, Dry Creek and Lower Cottonwood Creek, flow from the north into Lower Bully Creek. This network of watersheds drains about 540 square miles (345,600 acres). The subbasin has about 927 miles of creeks and streams, of which over 56 percent (524 miles) are located on BLM land, almost 43 percent (396 miles) on private land, and less than 1 percent on other lands (Reclamation, 6 miles; State of Oregon, 1 mile).

Over the course of 182 miles of creeks, these tributaries deliver between 4,000 and 21,000 acre-feet annually to Bully Creek Reservoir for irrigation and recreational use. The Bully Creek Coalition is concerned with the water quantity and quality from the headwaters to the reservoir. The members of the coalition own about 65 percent of the private lands above the reservoir and lease most of the BLM allotments in the headwaters. Coalition members see a management opportunity to successfully enhance their watersheds in cooperation with BLM and Reclamation. A listing of the creeks, their forks, and lengths can be found in appendix table 1–2.

Bully Creek Dam and Reservoir are located on Bully Creek, about 8 miles northwest of the confluence with the Malheur River, which is 1 mile northwest of Vale, Oregon. The dam, completed in 1963, is a zoned earthfill structure with a crest length of 3,070 feet and is 121 feet high. The reservoir has an active capacity of 30,000 acre-feet. The dam was constructed by Reclamation and is operated by the Vale, Oregon Irrigation District.

The reservoir provides specific storage space for flood control. It is instrumental in reducing floods on the Malheur River that could cause considerable damage and losses, and in controlling flood damages along Bully Creek and below its mouth on the Malheur River.

Bully Creek Dam and Reservoir are operated on a "coordinated forecast basis" with the Warm Springs and Agency Valley Dams, both on the Malheur River, upstream from Bully Creek. The three-dam system provides irrigation water to about 35,000 acres. Principal crops are grain, hay, sugar beets, sweet corn, onions, and potatoes.

Bully Creek Reservoir lies in a narrow, curving valley bounded on both sides by steep hills. With seven miles of shoreline, it is the smallest of the three reservoirs. Recreation facilities include a campground, swimming beach, and boat launching and mooring facilities. The fishery provides excellent catches of white crappie, yellow perch, and black bass. The reservoir is used as a resting place by migratory waterfowl with some ducks remaining to nest. Sparse vegetative cover of sagebrush and grass provides habitat for small mammals and birds.

Drainages in the upper watersheds of the subbasin are characterized by steep mountainous sideslopes, narrow canyons, and high-gradient stream channels. The lower portion of the subbasin contains rolling hills with broadening alluvial bottoms and low-gradient stream channels.

Most of the streams above Westfall contain a dendritic (tree-like branching) drainage pattern in the upper half of each watershed. Downstream, the patterns become more linear. The creeks and streams below Westfall are linear along most of their length. In the upper watersheds, high runoffs from snowmelt or thunderstorms often cause short-duration, but high peak flows. Under the same runoff conditions, linear drainage patterns tend to have lower peak flows, but for longer periods than dendritic patterns. Each flow pattern affects stream channels differently, depending upon gradient of the terrain, streambank and vegetation condition, the mineral parent material, and time and season of runoff.

Water discharge information has been recorded at two locations in the subbasin. The lower gauging station is on top of the Bully Creek Dam at river mile (RM) 12.5. The upper station was at RM 17.2 and was discontinued in 1985. The upper station recorded about 98.5 percent of the drainage area that flowed into the reservoir. The period of record for that station covers 28 years (waters years 1906, 1912–16, and 1964–85) with an average discharge of 53.6 cubic feet per second (cfs), about 38,800 acre-feet per year. The extreme maximum discharge was 12,800 cfs on December 22, 1964 and the minimum discharge was no flow at various times.

Peak discharge from snowmelt runoff usually occurs mid-February to mid-March. Peak flow then slowly recedes until late April through mid-May, when irrigation diversions reduce the flow to 15 cfs or less. This level remains somewhat constant until mid-July. At that time, flows diminish and only base flow from springs and alluvial seepage is recorded at the station. This discharge increases with the occurrence of thunderstorms.

Table 1. Average Monthly and Annual Precipitation on Bully Creek at Westfall
(in inches)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Westfall	0.38	1.11	1.42	1.25	0.62	0.87	0.47	0.72	0.78	0.52	0.48	0.38	10.05
Source: National Oceanic and Atmospheric Administration; period of record, 1971–77													

E. FISHERY RESOURCES

In 1961, a survey was conducted to provide information on the general condition of the streams, the species of fish present, and their general distribution. The survey was taken by the ODFW just prior to the construction of the dam and taken upstream of the proposed reservoir.

There are 21 species of fish found in the subbasin (table 2–1 in the appendix). Redband trout is the only native gamefish[1] species. Hatchery rainbow trout are stocked into several small reservoirs. Redband trout were observed in both Cottonwood Creeks, South Fork Indian Creek, upper Bully Creek, and upper Clover Creek. Local ranchers reported to the surveyor that a population of redbands existed in the headwaters of Reds Creek. Since the completion of the downstream dams, there is no known evidence of anadromous fish use.

A discussion of fishery resources appears in Appendix 2. The discussion includes the fish populations found in the subbasin, the habitat necessary to support them, instream and riparian habitat, a historical perspective, present status, management goals, and concerns.

F. WILDLIFE

There are approximately 205 vertebrate species in the Bully Creek subbasin. In addition, Bully Creek Reservoir provides habitat for waterfowl, shorebirds, bald eagles, and osprey. Bat species have not been surveyed in the area, but habitat is available throughout much of the watershed. Little is known about invertebrate species in the area. Appendix 3 describes games species related to the subbasin. Appendix 4 provides a wildlife analysis. Vertebrate species that occur in the subbasin are shown in appendix tables 4–1 through 4–4.

BLM manages wildlife habitat rather than the wildlife species. Riparian habitats are used by the greatest number of species, followed by tall sagebrush-bunchgrass habitats. The third largest number of animal species use juniper-sagebrush-bunchgrass communities. Habitats are discussed in Appendix 4, section B.

All wildlife species are the property of the State of Oregon. ODFW has management jurisdiction over most of these species, whether on private or public lands. Most wildlife species in Oregon receive some level of protection by law. "Nongame wildlife" — such as small birds, small mammals, reptiles, and amphibians — constitute the majority of species and killing them is not allowed.

Other wildlife species, larger in size and offering a "consumptive" value to society, are broadly categorized as "game" species. These are further categorized as big game, upland gamebirds, furbearers, and waterfowl. Most of these species are abundant enough to allow annual harvest by hunting or trapping.

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[1] "Gamefish," designated by ODFW, are those fish that people prefer to eat and that can grow to trophy size.

1. Big Game — The primary big game species are the Rocky Mountain elk and the Rocky Mountain mule deer. Big game animals are valued because their carcasses are edible and those with larger horns or antlers offer a trophy value. Big game are highly mobile and frequently occupy private land and in some cases cause damage to agricultural crops. Hunting, while viewed by many as recreational opportunity, is the primary tool used to control population numbers.

2. Furbearers — Hunting and trapping of many of these species for fur is allowed on at least a seasonal basis. These furbearers can be expected to occur in the subbasin: bobcat, beaver, mink, river otter, raccoon, and muskrat. Until riparian condition has been restored to the point where it can support stable populations, beavers should be maintained at very low levels or precluded from occupancy. From that point on, populations should be managed so that over-utilization of food sources does not occur.

3. Upland Gamebirds — There are five primary species of upland game birds. These are the sage grouse, chuckar partridge, California quail, mountain quail, and the ring-necked pheasant. Upland gamebirds are highly valued by hunters. Some species in the subbasin have been introduced by ODFW to provide additional hunting opportunities. Upland gamebirds are highly productive but also tend to have extremely high annual mortality rates. They are also impacted by severe winter weather conditions. See appendix table 4–2 for a list of all birds in Bully Creek subbasin.

G. SPECIAL STATUS SPECIES

Except for the bald eagle, there are no other known threatened or endangered wildlife species within the subbasin. Bald eagles, listed as threatened, can be found on Bully Creek Reservoir in winter. Spotted frogs are a "candidate" wildlife species, one being considered for listing as threatened or endangered. BLM policy does not allow actions which would cause a candidate species to become listed as threatened or endangered. There are also wildlife "species of concern" to the State of Oregon; the BLM treats these species (called "Bureau sensitive") as if they were candidates. Mountain quail and sharp-tailed grouse, also species of concern, were present historically, but no longer occur. Species accounts for special status wildlife and fisheries species are found in Appendix 5.

There are no known threatened or endangered plant species or special status plants which require special management within the Bully Creek subbasin. However, the area has not been thoroughly inventoried for botanical resources. Additional inventories will be required before projects can be undertaken on public lands. Management and treatment of any new species or identification of species currently under review will need to be addressed in plans for the area.

H. GENERAL VEGETATION

The Bully Creek subbasin lies within the sagebrush-steppe vegetative zone. The unit falls within the northernmost fringe of the Owyhee Uplands physiographic province and the southernmost extent of the Blue Mountain physiographic province. These provinces reflect both the geology and vegetation that occur in these areas.

A rich mosaic of vegetative types is present within the predominantly sagebrush landscape. Elevations vary from 3300 feet to 6100 feet. The fringe of mountains to the west, including the Ironside–Castle Rock series, collects moisture which is deposited as snow and rainfall in the higher elevations during the fall, winter, and early spring months. A rain shadow extends eastward toward Westfall and Cottonwood Mountain, reducing precipitation by 10 inches and causing significantly more arid conditions than at the Bully Creek headwaters. Arid lands are frequently characterized by their lack of uniformity in vegetative communities because the opportunity for numerous microsites with small variations in soil formation and type, slope, aspect, and precipitation give rise to widely different assemblages, as well as numbers, of plants.

1. Upland Vegetation — There are 21 upland vegetative types in the Bully Creek subbasin. These are discussed in detail in Appendix 6. Conditions are variable and are discussed in the resource analysis for each watershed.

2. Modified Vegetation — Several seedings, primarily crested wheatgrass, were planted in the subbasin during the Vale Project in the 1960's. Sagebrush spraying also was done on a limited number of acres. A controlled burn of approximately 1,000 acres in the North Ridge Pasture was conducted in 1984. Conditions of the seedings have deteriorated over the last 15 years, with numerous areas of weak, unproductive plants and much invasion by big sagebrush. A listing of the acres of crested wheatgrass seeding and their condition will be added when available.

3. Riparian Vegetation — Limited inventories have been made of riparian vegetation to determine condition classes or to develop species lists. Tree species include willow, quaking aspen, water birch, alder, and native cottonwood. Shrubby species represented in these areas often include numerous willow, golden current, chokecherry, bitter cherry, red osier dogwood, and syringa (mock orange). Grasses, rushes, and sedges predominate in the understory. Kentucky bluegrass, an exotic species, is found in many drainages and is an indicator of disturbed riparian conditions. "Photo points" and low-level color infrared aerial photos show downward or static trends on riparian vegetation throughout much of the subbasin. There are also many areas where the trend is undocumented. A listing of the trends and the number of stream miles involved will be added to this watershed action strategy when available.

4. Aspen — Quaking aspen is generally restricted to areas of locally high soil moisture at higher elevations, on north slopes and along riparian zones within the Bully Creek subbasin. As is the case in much of the Blue Mountains, the distribution of aspen has decreased in the last 100 to 200 years. This has been attributed to the following factors:

- ***Reduced occurrence of fire*** which stimulates suckering of clonal roots in aspen and destroys conifers which will replace aspen through succession on most sites. Aspen grows very fast when young, so overtops most other species in a burned area, but is very intolerant of shade;

- ***Over-browsing of aspen suckers*** by cattle, elk and deer. Continued browsing of young aspen reduces the number of trees which grow to large size. Large aspen, which live only 100–120 years, eventually die with few young trees to replace them. This eventually leads to the death of clonal root systems and permanent loss of stands;

- ***Loss of suitable habitat*** where streams have downcut and water tables have been lowered due to management practices.

5. Juniper — Western juniper has expanded its acreage in eastern Oregon by 3–10 times in the last 100 years. This trend began around the turn of the century with favorable climatic conditions for plant establishment. More important factors in this expansions were wildfire suppression efforts and the reduction of fine fuels by grazing livestock.

Western juniper is easily killed by fire when young. Historically, juniper was restricted to areas of low productivity where fire frequencies were limited by lack of fine fuels (grasses and forbs) or by rock outcrops. With less frequent fire, juniper has expanded into formerly "fire-maintained" grasslands and shrublands. Within the Bully Creek subbasin, juniper is continuing to expand its range into aspen stands, riparian areas, bitterbrush, and mountain big sagebrush communities, among others.

Junipers, especially at high densities, have a negative impact on production, diversity, and cover of associated plant species. This is a result of its efficiency at extracting water from the soil. Junipers have extensive spreading root systems which allow them to compete very effectively with surrounding plants.

The conversion of shrub steppe communities to juniper woodlands has influenced ecological processes on the landscape. As western juniper increases on a site, understory production — the layer of foliage below the tree canopy — decreases due to reduced soil moisture and nutrient availability. Reduced vegetative cover causes increased soil erosion and sediment production. Only a portion of the precipitation intercepted by the juniper canopy reaches the ground. The end result is that as western juniper density increases, the site becomes increasingly arid, herbaceous production is depressed, and watershed quality is diminished. These areas also become more susceptible to invasion by weed species.

6. **Weeds** — Although a variety of weed species can be found in the Bully Creek subbasin, very little information is available on overall weed conditions. Most of the area has not been inventoried to determine the extent of weed invasion or the number of species present.

BLM has established priorities for treatment of noxious weeds. Two species, Russian knapweed and whitetop, are known to occur in the subbasin. Both are designated by the Oregon Department of Agriculture as being of "economic significance," but occur enough to make their control and/or eradication difficult. Therefore, they not targeted as "high priority" by the State.

Russian knapweed has a high BLM priority for treatment. Russian knapweed is well established in parts of the subbasin and is invading other areas along the network of roads. Whitetop has a low priority because it is abundant in parts of the subbasin. It can, however, can become "high priority" when small, isolated spots are discovered within a previously non-infested area. Whitetop is known to exist in the upper reaches of some of the streams and in lower elevations, especially around ranches and farmsteads.

Various other weedy and non-native species are also present in the subbasin, but the variety of species and area involved is not known.

I. RECREATION

Upland and big game hunting are the most popular dispersed recreational activities occurring on public lands in the Bully Creek subbasin. Other activities include camping, hiking, horseback riding, photograph, and general sightseeing. The only developed recreation facilities are at Bully Creek Reservoir.

The BLM-administered land in the subbasin is classified as an "extensive recreation management area." There are no existing or potential "special recreation management area" or "developed recreation" sites on public land.

The BLM "recreation opportunity spectrum" (ROS) system is used to classify recreation resources on public lands. ROS classifications are not conducted on non-BLM lands. Most of the modifications made by humans on public lands are associated with roads and with livestock management (fences, livestock watering reservoirs, developed springs, etc.). A list of the acres within the subbasin classified as "roaded natural," "semi-primitive roaded," and "semi-primitive non-motorized" will be added to this document when available.

Recreation activities occurring in the area are dispersed. There are no estimates of recreation visitation in the Bully Creek subbasin. Most use is associated with hunting big game species and small gamebirds. The subbasin is within the State's Beulah Unit, a popular big game hunting area.

Other recreational uses on public lands within the subbasin include camping, hiking, horseback riding, nature observation, and general sightseeing associated with the area's predominately primitive road network. The Beaver Dam Creek Wilderness Study Area, in the Upper Bully Creek watershed, offers high-quality, non-motorized outdoor recreation and opportunities for solitude. Public fishing is available in reservoirs stocked by ODFW.

Bully Creek Reservoir County Park (on land leased from Reclamation) has 50 acres of developed facilities. The reservoir has 7 miles of shoreline and 985 acres of water surface, and it is popular with local residents for warm-water fishing, recreational boating, camping, and picnicking. The park manager has records for camping, but not for day-use activities.

J. WILDERNESS VALUES

The 19,580-acre Beaver Dam Creek Wilderness Study Area (WSA) is located within the Upper Bully Creek watershed. The WSA is being managed under the BLM Wilderness Review Program (see Appendix 7).

The WSA is a roadless area possessing opportunities for solitude and primitive types of recreation. It is located entirely in the juniper steppe woodland transition zone between the ponderosa pine forest and sagebrush steppe. The zone's mixture of western juniper, patches of mountain mahogany, and stands of quaking aspen in rolling hills of sagebrush provides a diversity of wildlife habitat.

The wilderness values associated with the WSA include the juniper steppe woodland plant community as a transition zone providing increased wildlife habitat edge and natural community diversity, the presence of sage grouse (a candidate species), and outstanding opportunities for solitude and nonmotorized types of outdoor recreation activities.

The BLM's legislative charter, the 1976 Federal Land Policy and Management Act (FLPMA), directed that among other things, the agency's lands be inventoried to see if they contained certain "wilderness characteristics." The criteria include that a WSA be undeveloped, have more than 5,000 acres, be in "substantially natural condition," have the "characteristics of roadlessness," and contain "outstanding opportunities for solitude."

While a wilderness study is underway, FLPMA "...allows the continuation of grazing, mining, and mineral leasing ... in the manner and degree in which these uses were being conducted [when the law was passed] as long as they do not cause unnecessary or undue degradation of the lands. ... Actions that clearly benefit a WSA's wilderness values through activities that restore, protect, or maintain these values are allowable, but must be carried out in a manner that is least disturbing to the site."

Beaver Dam Creek WSA was not recommended for wilderness designation. However, until Congress acts on the wilderness recommendations or otherwise releases WSA's for other management purposes, WSA's are managed in accordance with BLM's *Interim Management Policy for Lands Under Wilderness Review* (IMP) (summarized in Appendix 8) and by other applicable laws and policies (Appendix 9). The purpose of the IMP is to follow the FLPMA mandate of managing public lands under review so as not to impair their suitability for preservation as wilderness.

K. HISTORY OF USES

1. Prehistory — The Bully Creek subbasin lies within the boundaries of the northern Great Basin, which extends south into Nevada, west to Fort Rock, and east to the Snake River. The majority of information about the northern Great Basin comes from the excavations of rock shelters such as Fort Rock Cave, Catlow Cave, Roaring Springs Cave, and Dirty Shame Rockshelter, all located in southeastern Oregon. The earliest dates for human occupation of eastern Oregon (about 13,000 years ago) come from dated charcoal found in a hearth at Dirty Shame Rockshelter. The pattern of occupation in eastern Oregon consisted of small family groups (20 to 30 persons) moving from area to area as resources became available.

Beginning about 1,000 years ago, the Northern Paiute moved into the area. Two subgroups of the Northern Paiute occupied the area of the Bully Creek subbasin. The "salmon-eaters" maintained a fishing-oriented lifestyle, utilizing the Snake River and its tributaries. The "seed-eaters" followed animal migrations and seasonal availability of resources, utilizing over 50 plants and animal species. The Burns Paiute are direct descendants of these peoples and use traditional areas for onion and pine nut harvesting.

2. History — The historic period began with the explorations of Lewis and Clark in 1804. In 1811, the Pacific Fur Company traveled through what is now Malheur County to trap furs and take them on to Astoria. In 1843, the Oregon Trail became the primary route from Missouri to the Oregon Territory. By 1863–64, cattle ranching and farming were permanently established. Following the pioneers, miners came in search of gold, mercury, diatomite, gas, oil, and geothermal resources.

3. Grazing History — Horses arrived in the Bully Creek area about 1750, and most settlers who came later also owned horses. Cattle-raising began in the Vale area around the 1830's as all the early travelers and settlers maintained livestock for food, power, and clothing. During the 1860's, sheep-raising and farming were going strong. Many sheep were herded in migrant bands over "free" range, ignoring the land claims of the cattlemen.

Beginning in 1870, the grazing land was occupied by large numbers of cattle, sheep, and horses for about 60 years. Range use was year-round because there was little hay or other winter feed available. After the winter of 1989–90, there was an increase of grazing on farm-raised feed and hay. By 1900, range deterioration reached severe proportions because of the unregulated "first-come-first-served" year-round grazing. There was continued rangeland deterioration and erosion until 1934, when Congress passed the Taylor Grazing Act.

The purpose of the Taylor Act was "...to preserve the land and its resources from destruction or unnecessary injury and to provide for the orderly use, improvement, and development of the range." This law followed the various Homestead acts, and essentially marked the end of the open-grazing era. Allocation of grazing privileges quickly became the principal issue on public lands.

The newly formed U.S. Grazing Service (a predecessor of BLM) depended on advisory boards elected by the permittees to set grazing capacities and priorities of use. Bottom land along the creeks and valleys where native hay and winter pasturage were plentiful was established as the base property in support of the grazing preference on public lands.

Because of the deteriorated range conditions in the Bully Creek area, large reductions in grazing preference were proposed. Out of the ensuing controversy and litigation, the Vale Project was begun. Congress approved a special allocation of funds over a 10-year period for rehabilitation of the depleted rangeland to lessen or prevent the economic impacts of the proposed grazing preference reductions.

Rehabilitation included seeding, sagebrush control, fencing, and water developments. Along with the range improvements, grazing management was initiated in many of the allotments and the resource conditions began to improve. While these range improvements were a great start toward restoring the productivity and health of the area, much more work is needed to restore the riparian areas to their potential and further improve the uplands.

4. Cattle Industry — Ranking as the top commodity in 1994, the estimated sales for the cattle industry in Malheur County was $52.9 million. The Bully Creek subbasin represents 15 percent of the public animal unit months (AUM's) in the county; it is reasonable to assume it also represents 15 percent of the total sales in the county. That means the Bully Creek subbasin generated $7.9 million that year. Malheur County has more beef cows than any other county in Oregon, an estimated 68,000. Three aspects of the industry are represented:

- **Cow-calf** — This is the largest segment of the industry in the county and a large portion of it is located in the outlying areas. Most of the operators run on public lands (BLM and some Forest Service). The 4.5 million acres of public rangelands comprise 75 percent of the county's total land base.

- **Yearlings** — These are run by a few ranchers. Small calves (450–600 pounds) are fed on grass in the summer, sold in the fall (by then weighing about 800–900 pounds), and sent to feedlots for finishing.

- **Feedlots** — The county has one of the largest feedlots in Oregon, with a capacity of 30,000 head in the summer. There are also several small feedlots in the Vale, Brogan, Ontario, and Nyssa areas; these use a large amount of feed that is grown in the county.

L. GRAZING ALLOTMENTS

There are 25 BLM grazing allotments wholly or partially located within the Bully Creek subbasin. The classification of an allotment is determined by its condition and potential for resource conflicts. There are all or part of nine "I" (improve), six "M" (maintain), and 10 "C" (custodial) category allotments. Allotments in the "I" category are evaluated every five years, the "M" category every 10 years, and the "C" category are evaluated as needed, unless problems dictate otherwise.

The 25 allotments have a total of 170 pastures, 100 within the subbasin. Thirteen of these pastures have riparian objectives; 10 pastures are riparian "exclosures." The other objectives are to improve or maintain range conditions, maintain or improve mule deer winter forage, and maximize availability of fall green-up in crested wheatgrass seedlings for wintering mule deer and/or antelope.

Grazing preference is 66,099 AUM's of active use and 4,653 AUM's of "suspended" use, reflecting the total allocation of allotment preference. There are 33 grazing permittees in the subbasin.

In the 384,600-acre subbasin, the BLM has jurisdiction over about 65.5 percent of the land (251,913 acres), the private sector owns 33.9 percent (130,511 acres), and the State and other Federal agencies have less than 1 percent each (725 and 1,460 acres, respectively).

M. ROADS AND TRANSPORTATION

There are about 215 miles of public and private roads in the subbasin that are maintained by BLM, the State, or Malheur County (table 2). BLM roads are maintained either on a scheduled or on an as-needed basis, depending on the route, use levels, climatic conditions, and available funding. BLM has acquired three exclusive access easements for 10 road segments and one nonexclusive easement for one road segment across private lands. There are 15 additional road segments crossing private lands where access easement acquisition needs have been identified. The easements would allow for appropriate legal public and administrative access to public lands. The remaining roads are mostly on private lands. Malheur County maintains some routes and the Oregon Department of Transportation maintains Graham Road and U.S. Highway 20. There are also many miles of roads within the subbasin that are either not maintained or are casual two-tracks.

Table 2. Roads of Bully Creek Subbasin

Ownership	Maintenance Provider	Miles
Private	Malheur County	70.01
Private	State of Oregon	13.93
Private	BLM	9.67
Public	Malheur County	40.82
Public	BLM	76.54
Reclamation	Malheur County	3.48
Total		**214.5**
Source: BLM, Vale OR; April 1996		

CHAPTER 4.
RESOURCE ASSESSMENT BY WATERSHED

Present status of upland range, riparian, water quantity, water quality, and the implementation and maintenance of BMP's are similar throughout the subbasin. Higher elevations tend to be in better condition than the lower elevations, partially due to higher precipitation. Lower elevations also suffer from the cumulative impacts of conditions found in the upper watersheds.

UPLAND RANGE CONDITION — Overall, Upper Bully Creek, Lower Bully Creek, and Clover Creek are in better condition than Indian Creek and Upper Cottonwood Creek. However, all of the watersheds have some severe problems in the lower elevations. Historic overstocking, improper season of use, and poor distribution of livestock have led to a loss of native perennial grasses in many areas. There are still healthy stands of native perennial grasses, especially in the higher elevations of Clover Creek and Upper Bully Creek. Weedy annuals, juniper, and sagebrush are increasing.

RIPARIAN CONDITION — Improper season of use, poor distribution, and overstocking of livestock have led to long-term downward trends in streambank stability and riparian vegetation. The increasing elk herd is also impacting aspen regeneration to an unknown degree. Juniper, sagebrush, and weedy annuals are increasing throughout all watersheds. Higher gradient streams with deep soils in Upper Bully Creek and Clover Creek have severe downcutting. Some portions of Clover Creek are beginning to show a static to upward trend.

WATER QUANTITY — Rapid spring runoff, poor infiltration, and loss of formerly perennial springs and stream segments are found throughout the entire subbasin.

WATER QUALITY — Sedimentation, water temperature, and e. coli are problems in Upper Bully Creek, Lower Bully Creek, and Clover Creek. E. coli is less of a problem in Indian Creek. Sedimentation and temperature are concerns in Indian Creek and Upper Cottonwood Creek. Temperatures tend to be higher at lower elevations due to lower flows, less gradient, and less riparian vegetation to shade the streams. Natural thermal springs are present in lower reaches of Upper Bully Creek.

BEST MANAGEMENT PRACTICES — Some BMP's have been implemented in Upper Bully Creek, Clover Creek, and Indian Creek watersheds. Further implementation is needed throughout the subbasin. Range improvement projects on public lands have not been maintained to BLM standards.

This chapter provides an integrated assessment of conditions on public and private lands in the subbasin. Appendix 10 provides an assessment of various resources on the private lands within the subbasin's five watersheds. Appendix 11 provides a similar assessment for BLM lands.

UPPER BULLY CREEK

Goal 1. Achieve stable-to-improved trend in range conditions.

a. Range condition — Current condition poor to good, with better condition range in upper watershed. Mostly in downward trend. Loss of historic diversity of vegetation. BLM objectives not being met. Juniper and sagebrush increasing. Some early seral range may be incapable of improvement. Whitetop, Russian knapweed present. Noxious weeds likely to expand along roads. Lack of forage due to poor distribution, unauthorized use on public lands, improper season of use, historic overstocking of livestock. Elk herd increasing; impacts to uplands unknown.

b. Wildlife habitat — Upland habitats mostly in good condition. Some sage grouse habitat in downward trend. Juniper expansion, loss of lower elevation native bunchgrass and mixed shrub communities may have negative impact. Agricultural ground provides winter habitat for big game.

c. Erosion — Not measured; more erosion occurs on range with downward trend. Relatively high density of roads contributes to erosion.

Goal 2. Achieve proper functioning condition (PFC) on all streams.

a. Riparian vegetation — Most woody and herbaceous riparian vegetation in decline or absent throughout. Aspen stands disappearing, not regenerating. Native grasses often replaced by weedy annuals. Juniper and sagebrush increasing. BLM objectives not being met. PFC not determined for most of watershed, believed to be non-functional or functioning- at-risk. Whitetop prevalent along riparian corridors. Improper season of use, poor distribution, other livestock management practices a major cause of current condition. Increasing elk herd contributing to lack of aspen regeneration.

b. Wildlife/fisheries habitat — Most wildlife species limited by loss of woody riparian species. Limited habitat for cold-water fish due to high temperatures. Warm-water species found in lower reaches. All fish species limited by low water flows.

c. Streambank stability — Substantial streambank erosion, channel degradation and downcutting throughout.

Goal 3. Improve water quality

Above agricultural areas, temperature and sedimentation are concerns. E. coli, turbidity, temperature, and eutrophication are problems in lower reaches. E. coli in lower reaches above EPA standards.

Goal 4. Improve water quantity

Some formerly perennial springs and streams now ephemeral. Detailed historic discharge information not available.

Goal 5. Implement and maintain Best Management Practices (BMP's)

BMP's not implemented over much of watershed. Range improvement projects (fences, spring developments, pipelines, seedings) on public lands not maintained to BLM standards.

LOWER BULLY CREEK

Goal 1. Achieve stable-to-improved trend in range conditions.

a. **Range condition** — Shallow soils. Vegetation in poor to good condition. Native grasses lacking in lower elevations. Sagebrush, juniper and weedy annuals increasing. Loss of historic diversity of vegetation. Some early seral range may be incapable of improvement. Weed and livestock management problems similar to Upper Bully Creek. Lack of livestock water contributes to distribution problems. Public lands not assessed.

b. Wildlife habitat — Lower reaches are important big game winter range; native forage lacking. Juniper expansion, loss of lower elevation native bunchgrass and shrub communities may have negative impact. Public lands not assessed.

c. Erosion — Not measured; more erosion occurs on range with downward trend. Public lands not assessed.

Goal 2. Achieve proper functioning condition (PFC) on all streams.

a. Riparian vegetation — Lack of native riparian vegetation. Weedy annuals, juniper and sagebrush increasing. Aspen stands declining. In lower reaches, livestock use has been year — long. PFC not determined for most of watershed. Public lands not assessed.

b. Wildlife/fisheries habitat — Most wildlife species limited by loss of woody riparian species. Limited habitat for cold — water fish due to high temperatures. Warm — water species found in lower reaches. All fish species limited by low water flows. Public lands not assessed.

c. Streambank stability — Substantial streambank erosion, channel degradation and downcutting throughout. Public lands not assessed.

Goal 3. Improve water quality

High turbidity, E. coli and sediment are problems. Low flows and thermal springs contribute to high summer temperatures. Public lands not assessed.

Goal 4. Improve water quantity

Large flow events with rapid runoff in the spring. Low flows by early summer. Detailed historic data not available. Public lands not assessed.

Goal 5. Implement and maintain Best Management Practices (BMP's).

BMP's not implemented over much of watershed. Public lands not assessed.

CLOVER CREEK

Goal 1. Achieve stable-to-improved trend in range conditions.

a. Range condition — Vegetation in poor to good condition. Native grasses lacking in lower elevations. Sagebrush, juniper and weedy annuals increasing. Loss of historic diversity of vegetation. Some early seral range may be incapable of improvement. Weed and livestock management problems similar to Upper Bully Creek. Lack of livestock water contributes to distribution problems. Public lands not assessed.

b. Wildlife habitat — Similar to upper Bully Creek. Public lands not assessed.

c. Erosion — Not measured; more erosion occurs on range with downward trend. Relatively high density of roads contributes to erosion. Public lands not assessed.

Goal 2. Achieve proper functioning condition (PFC) on all streams.

a. Riparian vegetation — Similar to Upper Bully Creek. Loss of native vegetation, aspen disappearing. Juniper, sagebrush, weedy annuals increasing. PFC not determined for most of watershed, believed to be non -functioning or functioning at risk. Improper season of use, poor distribution, other livestock management practices a major cause of current condition. Increasing elk herd contributing to lack of aspen regeneration. Public lands not assessed.

b. Wildlife/fisheries habitat — Most wildlife species limited by lack of woody riparian species. Limited habitat for Cold water fish due to high stream temperatures. Warm-water species found in lower reaches. All fish species limited by low water flows. Public lands not assessed.

c. Streambank stability — Severe channel degradation in both upper and lower reaches. Public lands not assessed.

Goal 3. Improve water quality.

Water quality higher in upper reaches. High temperatures and E. coli concerns in lower reaches. Public lands not assessed.

Goal 4. Improve water quantity.

Rapid runoff in spring, low water flows by mid-summer. Detailed historic data not available. Public lands not assessed.

Goal 5. Implement and maintain Best Management Practices (BMP's)

BMP's such as juniper control, aspen protection, alternative water sources and fencing implemented on 3 ranches.

INDIAN CREEK

Goal 1. Achieve stable-to-improved trend in range conditions.

a. Range condition — Poor to fair condition. Lack of native bunchgrass in many areas. Juniper, sagebrush and weedy annuals increasing. Noxious weeds increasing, especially in lower reaches. Public lands not assessed.

b. Wildlife habitat — Lower elevations heavily used for big game winter range; native forage lacking. Juniper expansion, loss of native bunchgrass and shrub communities may have negative impacts. Public lands not assessed.

c. Erosion — Sheet and rill erosion present. Not measured; more erosion occurs on range with downward trend. Public lands not assessed.

Goal 2. Achieve proper functioning condition (PFC) on all streams.

a. Riparian vegetation — Juniper increasing throughout. Sagebrush and weedy annuals increasing on upper reaches. Little native vegetation. Noxious weeds increasing throughout. PFC not determined for most of watershed. Public lands not assessed.

b. Wildlife/fisheries habitat — Fish habitat only in reservoirs. Some wildlife habitat, especially big game. Only wildlife water source in summer; limited by extremely low flows. Public lands not assessed.

c. Streambank stability — Channel degradation found throughout. Public lands not assessed.

Goal 3. Improve water quality.

High temperatures, E. coli, pH, and eutrophication problems; increase in lower reaches. Public lands not assessed.

Goal 4. Improve water quantity.

Rapid runoff in spring, extremely low flows in late summer. Detailed historic data not available. Public lands not assessed.

Goal 5. Implement and maintain Best Management Practices (BMP's).

Weed control implemented on one ranch.

UPPER COTTONWOOD CREEK

Goal 1. Achieve stable-to-improved trend in range conditions.

a. Range condition — Similar to Indian Creek. Uplands in good condition at higher elevations. Loss of native bunchgrass and shrubs in lower elevations. Sagebrush and weedy annuals increasing. Noxious weeds present, especially in lower reaches. Public lands not assessed.

b. Wildlife habitat — Similar to Lower Bully Creek, Indian Creek. Big game winter range, especially in lower elevations. Loss of native bunchgrass and shrub communities may have negative impacts. Public lands not assessed.

c. Erosion — Not measured; more erosion occurs on range with downward trend. Public lands not assessed.

Goal 2. Achieve proper functioning condition (PFC) on all streams.

a. Riparian vegetation — Lack of native riparian vegetation on most lower reaches. Noxious weeds throughout; worse in lower reaches. Juniper, sagebrush, weedy annuals increasing on upper reaches. Public lands not assessed.

b. Wildlife/fisheries habitat — Some suitable fish habitat in lower reaches. Wildlife habitat similar to Indian Creek, Lower Bully Creek. Public lands not assessed.

c. Streambank stability — Channel degradation found throughout, except where streams are armored with rock.

Goal 3. Improve water quality.

High temperatures, E. coli, turbidity sedimentation all problems, especially in lower reaches. Public lands not assessed.

Goal 4. Improve water quantity.

High spring runoff, reduced to low flows in mid to late summer. Detailed historic data not available. Public lands not assessed.

Goal 5. Implement and maintain Best Management Practices (BMP's)

No BMP's presently implemented on private lands. Public lands not assessed.

CHAPTER 5.
STRATEGIES

The following objectives have been established as a means of achieving identified goals:

Goal 1. Achieve stable to improving trend in uplands conditions.

- Objective 1. Maintain late ecological conditions and potential natural communities where they currently exist.
- Objective 2. Improve ecological condition on sites in early and middle seral stages that retain native perennial vegetative species and have the potential for improvement.
- Objective 3. Reduce cropland soil erosion.
- Objective 4. Detect and eradicate new introductions of noxious weeds and contain large-scale infestations of noxious weeds.

Goal 2. Achieve PFC on all streams.

- Objective 1. Attain PFC or be moving toward PFC on all streams within the subbasin by 2015.
- Objective 2. Improve streambank stability by 2 percent per year through 2025.
- Objective 3. Reverse stream down cutting.
- Objective 4. Reduce stream width-to-depth ratio.

Goal 3. Improve stream flows.

- Objective 1. Increase water storage in alluvium and extend water release throughout the summer within the capability of streams within the subbasin.

Goal 4 Improve water quality.

- Objective 1. Reduce E. coli counts to remove creek from "303(d)" list.
- Objective 2. Reduce in stream fine sediment load to improve clarity.
- Objective 3. Increase stream shading by woody vegetation to PFC appropriate to soil, climate and landform.
- Objective 4. Reduce temperature to meet State water quality standards.

Goal 5. Implement and maintain Best Management Practices (BMP's).

- Objective 1. Complete cooperative resource management plans (CRMP's) for all ranches by 2007.
- Objective 2. Identify all appropriate BMP's and include in each public/private ranch plan.
- Objective 3. Partition all riparian pastures from upland pastures and manage separately by 2010.
- Objective 4. Establish cropland filter strips adjacent to riparian areas by 2015 when identified in ranch plans.
- Objective 5. Implement brush management practices to improve riparian and upland conditions if evaluations show they are needed.

- Objective 6. Implement prescribed burning to improve riparian and upland conditions when evaluations show they are needed.
- Objective 7. Implement at least one demonstration project a year to highlight a BMP listed in table 3.

The Bully Creek Coalition, working with NRCS and BLM, selected the following 21 BMP's as the potential actions that need the most attention: Brush management, Prescribed burning, Channel vegetation, Critical area planting, Deferred grazing, Diversion, Fencing, Fish stream improvement, Irrigation water management, Livestock exclusion, Pasture/hayland management, Planned grazing/system, Pond, Proper grazing use, Range seeding, Spring development, Streambank protection, Trough, Wildlife upland habitat, and Wildlife watering.

The subwatersheds in order of priority are:

(1) Clover Creek,
(2) Upper Bully Creek,
(3) Cottonwood Creek,
(4) Lower Bully Creek, and
(5) Indian Creek.

Bully Creek subbasin was divided into five watersheds. Each watershed was split into upland and riparian areas. These areas were analyzed for channel characteristics, human impacts, wilderness values, and ownership. Each segment was further analyzed for problems that contributed to riparian and upland degradation.

Problems were categorized and potential solutions identified. A flow chart (figure 2) was developed to prioritize projects as they are identified.

Projects that are relatively inexpensive or already incorporated into existing programs will be initiated whether or not resolution is viewed as a high or low priority.

Appendix 12 provides a definition of each of the 21 selected BMP's, the purpose for its application, and the condition of the resource where the practice applies. These definitions have been adapted from various NRCS technical manuals.

It is recognized that a solution to one problem may accentuate another, but in many cases the solutions can complement each other. To develop a successful plan, the cumulative effects of all the practices must be considered. Because the economic base of the subbasin is its natural resources, long-term solutions that best sustain the resources and maintain a healthy ecosystem are practices that must be utilized. When BLM assembles a resource management plan, the agency has various planning criteria that it follows. These criteria can be used to set the action strategy for Bully Creek subbasin and a summary of some of the BLM's planning guidelines is presented in appendix 13.

A "matrix" was developed that presents the results of implementing a BMP (see table 3). The matrix presents a cause-and-effect system. It summarizes the results of implementing a BMP on each of 28 resource categories. A simple combination of symbols and letters indicates the results of an action — positive, negative, short term, and long term. The matrix provides a fast check on which BMP's can cause a long-term negative effect. If a certain practice could result in a negative effect, it will need to be carefully analyzed to determine if there are positive reasons for taking action.

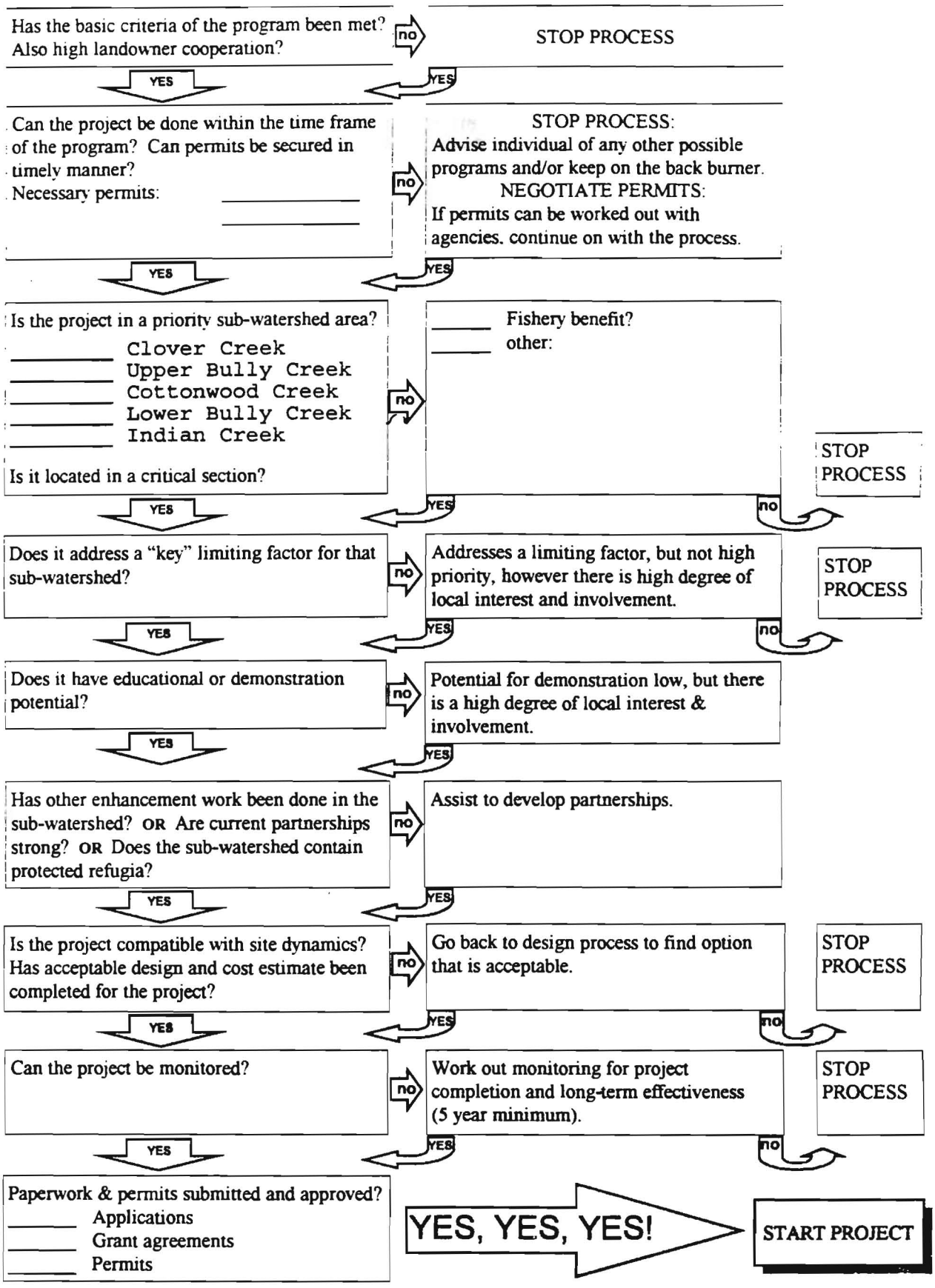

Figure 1. - Project Procedure Flowchart

CHAPTER 6.
ACCOMPLISHMENTS/IMPLEMENTATION

In 1993, the Clover Creek Ranch received two grants to implement a number of watershed projects.

In 1994, Bully Creek area ranchers talked about developing a 30-year management program. They incorporated and were recognized by the State in 1995. Also in 1995, the group received funding to develop an action strategy, and in 1996, they received a Governor's Water Enhancement Board (GWEB) grant to hire a coordinator to help them with development and implementation of their strategy.

In 1995, an elk monitoring program was begun and a grazing strategy was developed for upper Bully Creek. An attempt to partition an upper Bully Creek pasture into smaller units was abandoned because of BLM wilderness study area restrictions.

In 1995, juniper and sagebrush control and water development projects were implemented on Clover Creek. Upland spring developments were implemented on Indian and Clover Creeks, and environmental assessments were begun on those watersheds.

A water quality monitoring program was begun in 1995 and continued through 1996.

Three Bully Creek Watershed Council members received U.S. Department of Agriculture water quality grants for 1997. Practices that conserve water, improve water quality, manage nutrient applications, plan grazing systems, and control noxious weeds will be implemented on three ranches on Clover, Upper Bully, and Indian Creeks.

In 1997, the BLM plans to work with the Davis Ranch on Upper Bully and Clover Creeks to produce a public-and-private lands use-and-management strategy.

PROJECTS IMPLEMENTED PRIOR TO ESTABLISHMENT OF BULLY CREEK WATERSHED COUNCIL (BCWC)

No./ Date	PROJECT / TASK
1993-97	**Clover Creek Project** - Landowners in the headwaters of Clover Creek joined together to improve rangeland and riparian areas for livestock and wildlife. The project began in 1993 and is on-going. Cooperating agencies are Farm Services Agency (FSA), U.S. Natural Resources Conservation Service (NRCS), Oregon Department of Fish and Wildlife (ODFW), and Malheur County SWCD. Financial contributors include the landowners, Oregon GWEB grant, Rocky Mountain Elk Foundation. Oregon Hunters' Association, Mule Deer Foundation, Oregon Department of Agriculture, Oregon Habitat and Access Board, Malheur Anglers, and ODFW. Projects include (1) Sagebrush management; (2) Water development — livestock pools, spring developments and troughs, water storage and pipeline section with troughs; (3) Cross-fencing; (4) Juniper removal in riparian areas; (5) Installing cattle guards to replace gates on public roads; (6) Planting of shrubs on the uplands and trees in the riparian areas; (7) Burning late season to improve upland conditions and trends.

Continued →

BCWC ACTION STRATEGY

No. / Date	Project/Task
1994	Bully Creek area ranchers met to discuss the formation of an organization whose purpose would be a long-range (30-year) management program for the enhancement of resources in the Bully Creek watershed.
1995	The Bully Creek Watershed Coalition, Inc., was formed with nine members. The 9 contiguous cattle ranches represented (by ownership or lease) 60 per cent of the 547 square miles in the Bully Creek subbasin. The BCWC continued to contact and establish agreements with State and Federal resource management agencies.
95-1	**Juniper Mountain Project** - Three adjacent landowners joined together to restore riparian health and better manage livestock to improve condition and trend on the upper reaches of Reds Creek and Brady Creek. The project began in 1995 and will end in 1997. Cooperating agencies are NRCS, ODFW, Malheur County SWCD, and FSA. Financial contributors are the landowners, FSA, and ODFW. Projects include (1) Water developments — livestock pond repair, spring developments with troughs, and improving existing spring and riparian areas; (2) cross-fencing to manage livestock; (3) removal of juniper from spring sites and riparian areas; (4) fall burning of uplands.
95-2	BCWC submitted Articles of Incorporation to the Internal Revenue Service for "501(C)(3)" status (non-profit educational organization)
95-3	BCWC registered with the State of Oregon Secretary of State
95-4	BCWC entered into water quality monitoring agreement with the Oregon Department of Environmental Quality. The Malheur County extension office of Oregon State University was a cooperator. Monitoring services were provided by NRCS, in Ontario OR, and laboratory services by Reclamation's Regional Water Quality Lab, Boise ID
95-5	The Rocky Mountain Elk Foundation approved a grant ($10,000) to BCWC to be used with ODFW to perform an elk collaring and monitoring project. Radio collars were placed on 22 elk, which have since been monitored for movement within the watershed.
95-6	Farm Service Agency "special project" cost-share grants were awarded to 3 ranches to divide between two programs. Landowners Chris Davis (on Wheaton Creek), John Dearing (on Delishman Creek), and Smiley Wilcox (on Clover Creek) were granted $18,100 of the total of $40,800 budgeted for the projects. These were two of five such grants state-wide. Programs were: -Juniper control and sagebrush spraying -Water development
95-7	BCWC enters into an agreement with the U.S. Bureau of Reclamation in which funds ($22,000) were made available to hire Malheur County SWCD to assist BCWC in writing a watershed action strategy and gain technical assistance.
95-8	The National Wildlife Foundation awarded BCWC a grant ($10,000) for upland spring developments and environmental assessments. - Springs were developed by Calvin Haueter, JR Land Company, John Jordon, Stan Shepherd (Indian Creek Ranch), Chris and Bev Davis, and Smiley Wilcox (Clovercreek Ranch). - Shoyer Ranch completed 2 environmental assessments and grazing strategy for upper Bully Creek (see project 96-1).

No. / Date	Project/Task
1996	
96-1	Oregon Soil and Water Commission awarded BCWC a grant ($10,000) to the Shoyer Ranch for cross-fencing the upper Bully Creek pasture into 3 smaller fields. This was to provide better cattle management and decrease over-grazing in riparian areas. The money was returned because the pasture was in a BLM Wilderness Study Area and the law did not permit construction of a fence within the wilderness study area.
96-2	A second year of water quality monitoring was completed, which when matched with 1995 data, provided a 2-year baseline from which to measure changes which are likely results from watershed improvements.
96-3	BCWC was awarded a matching grant from GWEB to contract through Malheur County SWCD to hire and supervise a watershed coordinator who would "...enable landowners to implement an action strategy, as a self-administering watershed council, by developing administrative and technical skills through (training) sessions." The grant supported salary costs ($16,000) and office and administrative expenses ($7,000). The coordinator was hired August 1. A 3-day interdisciplinary course about watersheds, "Proper Function Condition Class," was presented in December to over 50 persons representing a variety of interests.
96-4	BCWC completed and distributed the 1996-97 action strategy with funding support from Reclamation and Bonneville Power Administration (BPA), and with the cooperation of BLM, Malheur County SWCD, NRCS, ODEQ, and ODFW.
1997 **The following activities are intended for 1997**	
97-1	In cooperation with NRCS, FSA, and Malheur County SWCD, a 3-year USDA water quality grant ($42,000) was awarded to the BCWC. These funds are made available to carry out management practices which conserve water, improve water quality, manage nutrient applications, plan grazing systems, and control noxious weeds. The participating ranchers include Chris and Beverly Davis ($21,000), Stan Shepherd ($10,500), and Smiley Wilcox ($10,500).
97-2	The BLM Vale District Office and NRCS Ontario are committed to jointly producing a public-and-private lands use-and-management strategy for the ranch of Chris and Beverly Davis.
97-3	Requests for site-specific "mini-grants" will be written and submitted to appropriate agencies and entities for assistance for 1997–98. These will be the first such requests which incorporate the Bully Creek Action Strategy.

CHAPTER 7.
MONITORING

The BCWC has selected measures of success related to their objectives. They are in the process of further refining those measures through development of protocols and schedules.

The following resource conditions and practices will be monitored:

Resource Conditions

Range Conditions	Stream flows	Water Temperature
Proper Functioning Condition	E. coli	Average Weaning Rates
Streambank Stability	Turbidity	Average Per-Head Weight Gains
Stream Downcutting	Cropland Soil Erosion	Average AUM's
Channel Width/Depth Ratio	Stream Shading	Avg Increase in Fish Distribution

Practices

Public-Private Ranch Plans	Number of BMP's Used	Riparian Pastures
Riparian Filter Strips	Brush Management	Prescribed Burning

Monitoring plays a pivotal role in detecting both positive and negative changes so that the effectiveness of management actions can be evaluated and necessary changes made to meet management goals and objectives. Monitoring should be implemented across the landscape in a collaborative way between neighbors and cooperating government agencies, including all those with an interest in management outcomes. If data is collected in many formats among agencies and individuals it makes integrating data very difficult and costly. This section provides a framework for gathering coordinated monitoring information in a cost effective way.

A summary of monitoring data collected in the subbasin will be made annually to track progress toward meeting watershed management objective.

The numbers preceding each measure refer back to the goals and objectives presented in Chapter 5; for example, "2.3" refers to Goal 2, Objective 3.

A. MONITORING PLAN

RESOURCE CONDITIONS. The following measures of resource conditions are designed to monitor progress toward the objectives under the first four goals defined in the "Strategies" section.

1.1 and 1.2 Upland Condition — maintaining or improving rangeland conditions

- Trend — trend plots established by land owners and agencies to measure changes in vegetation over time; baseline plots are established during development of the cooperative resource management plan (CRMP) and read on a periodic (5 to 15 years) basis as a part of evaluating the effectiveness of the CRMP.
- Actual forage use — forage use measured annually by land owners and agencies
- Actual livestock utilization — number and duration of grazing use measured annually by livestock owners.

1.3 Upland Soil Erosion — Watersheds will be assessed during ranch plan development and during annual status review; the measure is in tons/acre; the watershed to be assessed in 1997 is Upper Bully Creek.

1.4 Noxious Weeds — Cooperatively inventory and map all lands for noxious weeds; periodically re-inventory to establish trend.

2.0 and 2.1 Proper Functioning Condition — PFC, stream bank stability, stream bank down cutting, channel width/depth ratio.

- PFC surveys — These establish baseline conditions of riparian areas prior to developing CRMP's; riparian areas are resurveyed for PFC on a periodic (5 to 15 years) basis as part of evaluating the effectiveness of CRMP's.
- Trend — Trend plots established by land owners and agencies to measure changes in riparian conditions over time; baseline plots are established during development of the cooperative resource management plan (CRMP) and read on a periodic basis as a part of evaluating the effectiveness of the CRMP.
- Actual forage use — Forage and browse use by livestock and big game measured annually by land owners and agencies.
- Actual livestock utilization — Number and duration of grazing use by livestock and big game measured annually by livestock owners and agencies.

2.2 Streambank Stability — Will be assessed during PFC process. The watershed to be assessed in 1997 is Upper Bully Creek.

2.3 Stream Downcutting — Reported annually by landowners; NRCS, BLM, landowners identify measurement sites and methods.

2.4 Channel Width/Depth Ratio — Will be assessed during PFC project; the watershed to be assessed in 1997 is Upper Bully Creek.

3.1 Stream Flows — All watersheds assessed each year by landowners with NRCS and BLM assistance. Need to determine measurement sites and methods.

- Proper Functioning Condition survey — PFC surveys establish baseline conditions of riparian areas prior to developing CRMP's; riparian areas are resurveyed for PFC on a periodic basis as part of evaluating the effectiveness of CRMP's: water storage capacity of steams can be inferred from PFC.
- Weir — Install weirs at strategic points within the subbasin and take water flow measurements through out the summer season over time.

4.1 E. coli— All watersheds assessed each year under the "Water Quality Monitoring Strategy." The measure is bacteria (E. coli) in colony counts per 100 milliliters (counts/100 mL).

- Water samples — Establish water sampling points within the subbasin; take and analyze samples for E. coli periodically.

4.2.a Turbidity — All watersheds assessed each year under the "Water Quality Monitoring Strategy;" the measure is turbidity in nephelometric turbidity units (NTU's).

4.2.b Cropland Soil Erosion — Will be assessed during ranch plan development and at annual status review; the measure is in tons/acre/ year; watershed to be assessed in 1997 is Upper Bully Creek.

4.3.a Stream Shading —The watershed to be assessed in 1997 is Upper Bully Creek.

- PFC surveys — PFC surveys establish baseline conditions of riparian areas prior to developing CRMP's; riparian areas are resurveyed for PFC on a periodic basis as part of evaluating the effectiveness of CRMP's.
- Trend — Trend plots established by land owners and agencies to measure changes in riparian conditions over time; baseline plots are established during development of the cooperative resource management plan (CRMP) and read on a periodic basis as a part of evaluating the effectiveness of the CRMP.

4.3.b Water Temperature — All watersheds assessed each year under the "Water Quality Monitoring Strategy." The measure is water temperature in degrees Fahrenheit.

- Temperature — Establish water measurement sites; take water temperature measurements periodically to detect trends

The following measures are designed to measure progress toward resource goals specific to the Bully Creek Coalition and ODFW:

- **Average weaning rates** — All watersheds assessed each year by landowners.
- **Average per/head weight gains** — All watersheds assessed each year by landowners.
- **Average AUM's** — All watersheds assessed each year by landowners.
  - Actual forage use — forage use measured annually by land owners and agencies
  - Actual livestock utilization — number and duration of grazing use measured annually by livestock owners.
- **Average increase in fish distribution of native species** — One fifth of watersheds assessed each year by ODFW. The watershed to be assessed in 1997 is Upper Bully Creek.

PRACTICES. The following measures are designed to monitor progress toward the objectives under Goal 5 defined in the "Strategies" section -- Implement and maintain best management practices.

5. 1 Integrated Public-and-Private Ranch Management Plans — determined annually by BLM. Measure: number of CRMP's completed and percent of acreage under integrated plans.

5.2 Number of BMP's Used — reported annually by landowners; the measure is cumulative number of BMP's used.

5.3 Riparian Pastures — reported annually by landowners; the measure is percent of riparian area in separately managed riparian pastures.

5.4 Riparian Filter Strips — reported annually by landowners; the measure is percent of riparian cropland area with filter strips and/or critical area plantings.

5.5 Brush Management — reported annually by landowners; the measure is number of acres treated; NRCS, BLM, landowners determine qualifying methods.

5.6 Prescribed Burning — reported annually by landowners; the measure is number of acres treated.

B. WATER QUALITY MONITORING STRATEGY

1. Water quality history — Bully Creek subbasin is listed as a "water quality limited water-body" by the Oregon Department of Environmental Quality (DEQ) on its 1995 "draft 303(d)(1)" list.[2] Very little data has been taken from the subbasin that provides an outlook of any confidence on the quality of the water. Ranchers as well as agencies that manage public lands within the subbasin felt it was important to collect sound data so that they could become more aware of the overall health of the subbasin. The water quality monitoring strategy will be used to assess the quality of the water within the various watersheds. The strategy will also provide the Coalition and the Technical Committee with an additional tool to determine if the goals of the watershed action strategy are being met.

2. Baseline data — Preliminary monitoring began in the subbasin during the summer and fall of 1995. Eight monitoring sites were selected to cover the major sections of Bully Creek and its tributaries (see map of sites at figure 14–1). The monitoring was intended to get a general ideal of stream temperatures, to determine the accuracy of equipment available through local sources, and to determine the additional data needs listed in Section 5 below. Non-permanent instream temperature monitoring devices, called "hobos," were used to measure stream temperature every 45 minutes. Conductivity and pH were taken using Hach, Inc. brand-name meters; nitrates and turbidity samples were taken using a Hach spectrophotometer.

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[2] This list is issued annually by DEQ in response to U.S. Environmental Protection Agency requirements, as set forth in the Clean Water Act, section 303 (d)(1).

The experience gained from the 1995 monitoring program was used in the development of this monitoring strategy. **Appendix figures 14–2 through 14–8 represent the temperature data of the sites.

3. Goals — There are 3 primary goals for these water quality monitoring efforts:

- To collect "baseline" data of the present conditions — using standard measures — so that the quality of water in Bully Creek can be assessed. The data will also be used to assist with establishing the priority and order of treatment for specific segments of the streams that need attention.
- To then monitor specific sites to judge the effectiveness of individual projects.
- Measure overall trends.

4. Partners — The monitoring strategy will be accomplished by using a wide array of partners and resources:

- ***Ranchers within the subbasin*** will allow data collectors access to sampling sites and ensure the monitoring strategy is meeting their expectations.
- The ***Cooperative Extension Service*** will assist with monthly sampling and supply a portion of the instream temperature monitoring devices.
- The ***Bureau of Reclamation*** will provide lab analysis and sampling procedure guidance.
- The ***Natural Resources Conservation Service*** and the ***Malheur County Soil and Water Conservation District*** will assist with monthly sampling.
- The ***Bureau of Land Management*** will assist with monthly sampling on the public land within the upper reaches of the subbasin.

5. Monitoring program — The following data will be collected to meet the goal of assessing the water quality of the subbasin. Additional data will be collected when specific project effectiveness is being assessed. The additional data will vary depending on the project type and location. Data will be collected on the following parameters (and units of measurement). A complete description of each parameter is listed in Appendix 14.

- water temperature in degrees Fahrenheit (°F)
- ambient air temperature in degrees °F
- pH (hydrogen ion concentration in "standard units" (SU)
- conductivity in micromhos per centimeter (μmhos/cm)
- bacteria (E. coli) in colony counts per 100 milliliters (counts/100 mL)
- dissolved oxygen (DO) in milligrams per liter (mg/L)
- nitrates (NO_3) + nitrites (NO_2) in mg/L
- phosphorus (total P) in mg/L
- turbidity in nephelometric turbidity units (NTU's)
- stream flow in cubic feet per second (cfs)

6. Data Analysis — Data analysis will be completed by the Bully Creek Technical Committee which consists of a representative from the Bully Creek Coalition, ODFW, BLM, Malheur County SWCD, Cooperative Extension Service, NRCS, and Malheur County Weed Control.

7. Sampling sites and events — Ten sites were selected to meet the objectives of the first goal, assessing the water quality of Bully Creek and its tributaries. Future sites will be determined when projects are identified, in order to accomplish the second goal. Appendix figure 14–1 is a location map of monitoring sites; appendix table 14–3 describes the "sampling events," the time periods of data collection.

C. MEASURES

The following scales show status by year on the various measures of resources and practices:

- ***Resource Conditions***

1.0 Percent of range stable-to-improved	**0** *SAMPLE* **100**
Overall	1995 1996 1997
Upper Bully Creek	
Lower Bully Creek	
Clover Creek	
Indian Creek	
Cottonwood Creek	

2.1 Percent of streams in proper functioning condition	**0** **100**
Overall	
Upper Bully Creek	
Lower Bully Creek	
Clover Creek	
Indian Creek	
Cottonwood Creek	

2.2 Percent of stream banks stable	**0** **100**
Overall	
Upper Bully Creek	
Lower Bully Creek	
Clover Creek	
Indian Creek	
Cottonwood Creek	

2.3 Percent of downcut streams	100	0
Overall		
Upper Bully Creek		
Lower Bully Creek		
Clover Creek		
Indian Creek		
Cottonwood Creek		

2.4 Average stream width/depth ratio	B	T
Overall		
Upper Bully Creek		
Lower Bully Creek		
Clover Creek		
Indian Creek		
Cottonwood Creek		

3.1 Percent perennial streams	0	100
Overall		
Upper Bully Creek		
Lower Bully Creek		
Clover Creek		
Indian Creek		
Cottonwood Creek		

4.1 E. coli (average colony counts/100 mL)	**B**	**T**
Overall		
Upper Bully Creek		
Lower Bully Creek		
Clover Creek		
Indian Creek		
Cottonwood Creek		

4.2.a Turbidity (NTU's)	**B**	**T**
Overall		
Upper Bully Creek		
Lower Bully Creek		
Clover Creek		
Indian Creek		
Cottonwood Creek		

4.2.b Average soil erosion (tons/acre/year)	**B**	**T**
Overall		
Upper Bully Creek		
Lower Bully Creek		
Clover Creek		
Indian Creek		
Cottonwood Creek		

4.3.a Average percent stream shade	0	70
Overall		
Upper Bully Creek		
Lower Bully Creek		
Clover Creek		
Indian Creek		
Cottonwood Creek		

4.3.b Average water temperature	B	T
Overall		
Upper Bully Creek		
Lower Bully Creek		
Clover Creek		
Indian Creek		
Cottonwood Creek		

The following are measures related to specific goals of the Bully Creek Coalition and ODFW:

Average weaning rates	B	T
Overall		
Upper Bully Creek		
Lower Bully Creek		
Clover Creek		
Indian Creek		
Cottonwood Creek		

Average per head weight gains	B	T
Overall		
Upper Bully Creek		
Lower Bully Creek		
Clover Creek		
Indian Creek		
Cottonwood Creek		

Average animal unit months (AUM's)	B	T
Overall		
Upper Bully Creek		
Lower Bully Creek		
Clover Creek		
Indian Creek		
Cottonwood Creek		

Fish Populations Annual increase in distribution of native species	B	T
Overall		
Upper Bully Creek		
Lower Bully Creek		
Clover Creek		
Indian Creek		
Cottonwood Creek		

- ***Practices***

5.1 Percent of acreage under integrated public-private ranch management plans	**0**	**100**
Overall		
Upper Bully Creek		
Lower Bully Creek		
Clover Creek		
Indian Creek		
Cottonwood Creek		

5.2 Number of BMP's used	**0**	**100**
Overall		
Upper Bully Creek		
Lower Bully Creek		
Clover Creek		
Indian Creek		
Cottonwood Creek		

5.3 Percent of riparian area in separately-managed riparian pastures	**0**	**100**
Overall		
Upper Bully Creek		
Lower Bully Creek		
Clover Creek		
Indian Creek		
Cottonwood Creek		

5.4 Percent of cropland area with filter strips and/or critical area plantings	0	100
Overall		
Upper Bully Creek		
Lower Bully Creek		
Clover Creek		
Indian Creek		
Cottonwood Creek		

5.5 Percent of area needing brush management treated	0	100
Overall		
Upper Bully Creek		
Lower Bully Creek		
Clover Creek		
Indian Creek		
Cottonwood Creek		

5.6 Percent of area needing prescribed burning treated	0	100
Overall		
Upper Bully Creek		
Lower Bully Creek		
Clover Creek		
Indian Creek		
Cottonwood Creek		

CHAPTER 8.
EVALUATIONS

Evaluation is a key component of the management process. A comprehensive holistic review of this strategy and monitoring data will be made. If the planning is completed, the plan is implemented and monitoring data is gathered. Without the follow-up to judge the success of the plan a high likelihood exists that problems will not be detected until a crises develops. Evaluations will focus on actions and outcomes. Departures from expected conditions or results are not treated as failures, but rather as new information to improve the quality of management.

The evaluation process will be used to determine whether or not goals and objectives are being met and remain appropriate. It is the process of gathering together all the data available from the monitoring process and using it to answer these questions.

- Were the goals and objectives met?
- Were the implemented BMP's effective in meeting the goals and objectives?
- Were the underlaying management assumptions correct?
- Have laws, regulations, or public expectations for watershed management changed?

The final step in the evaluation process will be to make recommendations for changes in this strategy to meet desired outcomes.

Changes in watershed conditions occur slowly over time. Management evaluations made too frequently will not detect changes in the watershed because cost effective monitoring can not detect them. On the other hand, if evaluations are delayed for too long irreversible changes may take place without detection. To avoid this problem, two periodic evaluations are proposed: the first is an implementation evaluation to see if the BMP's are being implemented which will be conducted every three years. The second is an effectiveness evaluation which will be conducted in six years to see if BMP's are leading to achievement of goals and objectives.

Evaluations will be conducted jointly by landowners and cooperating agencies. The general public also will be invited to become involved.

CHAPTER 9.
CONCLUSIONS AND RECOMMENDATIONS

Unlike many areas in the Pacific Northwest, the Bully Creek subbasin has no threatened or endangered species. Thus, one might question the importance of writing this watershed action strategy. Early in the development of the Bully Creek Watershed action strategy, while researching for material, this anonymous quote was found in *The Napa River Watershed Owner's Manual*:

> *Human vanity can best be served by the reminder that whatever his accomplishments*
> *His sophistication*
> *His artistic pretension*
> *Man owes his very existence to a six-inch layer of topsoil and the fact that it rains.*

Many watershed action plans and strategies are written to improve habitat in order to save a fish stock and spawning area (or other rare or endangered species). Indeed, these are noble endeavors. When the last dust settles, action strategies such as this will be as highly regarded. This action strategy was written to save more of an area encompassing a watershed. The health of all the resources of the watershed are determined by the health of the soils and the waters that flows over, into, and through them.

The Bully Creek watershed action strategy builds logically from the introduction to conclusion. It describes the area and its history, the purpose for assembling the strategy, and the goals and objectives expected to be achieved. It assesses the watershed's qualities, good and poor, and includes a method to prioritize actions empirically. There is a matrix of best management practices to assist land managers determining ways to improve the watershed over the long term. It also contains a monitoring strategy and criteria to measure the success of land implementation projects.

It has never been a purpose of this action strategy to develop site-specific treatments. It is instead a roadmap to guide land managers in the development of individual action strategies that will accomplish contiguous habitat improvement. Only with the cooperation of all stakeholders carrying-out projects that complement each other will the entire watershed be able to be treated.

It is recommended that cooperative agreements and partnerships be formed. Successful implementation of the watershed projects will require a significant commitment on the part of landowners, Federal, State, and local agencies.

This action strategy is written for this generation and the next, to encompass a 30-year period. However, it is still necessary to prioritize projects into immediate, short term, long-term and ongoing actions. It is also recommended that the "top-down" — from ridge-top to ridge-top, from the headwaters to the mouth — watershed treatment methodology be used. Upland projects such as water development, cross fencing, seedings, and selective control of juniper and sage will make it possible to disperse livestock, thus taking pressure off of the riparian areas. Riparian projects will include stream bank stabilization, critical area plantings, fish habitat structures and improvements, fencing, and riparian grazing strategies.

It is recommended that the local landowners, working with the resource agencies — BLM, NRCS, and Malheur County SWCD — develop individual action strategies for 2–5 ranches per year (or more, if funds and staffing are available). These action strategies would incorporate the suggestions made in the Bully Watershed action strategy and would be site-specific.

It is recommended that BLM complete an analysis for each of the other four watersheds within the Bully Creek subbasin.

Contiguous habitat improvement must be accomplished in a timely and efficient timeframe to be successful. It is recommended that environmental interests be consulted in the planning process. The practice of timely communication often can lead to the discovery of shared values, goals, and objectives, which in turn can lead to mutually satisfactory solutions to resource problems.

The Governor's Water Enhancement Board has asked, "Who will catch the rain?" We answer, "Our watershed will." Our long-term purpose is to restore and maintain the land in the five watersheds of Bully Creek by enhancing their ability to capture, store, and safely release water.

BULLY CREEK WATERSHED
ASSESSMENT AND STRATEGY

APPENDICES

PREPARED BY:

BULLY CREEK WATERSHED COALITION, INC.
MALHEUR SOIL AND WATER CONSERVATION DISTRICT
U.S. BUREAU OF LAND MANAGEMENT
U.S. NATURAL RESOURCES CONSERVATION SERVICE
OREGON DEPARTMENT OF FISH AND WILDLIFE
OREGON STATE UNIVERSITY MALHEUR EXTENSION SERVICE
U.S. BUREAU OF RECLAMATION

August 1997

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