

POWDER/BROWNLEE AGRICULTURAL WATER QUALITY MANAGEMENT AREA PLAN

Developed by the

**POWDER/BROWNLEE
LOCAL ADVISORY COMMITTEE**

with assistance from

OREGON DEPARTMENT OF AGRICULTURE

and

**BAKER VALLEY, EAGLE VALLEY, and KEATING
SOIL AND WATER CONSERVATION DISTRICTS**

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ACRONYMS

AgWQM	Agricultural Water Quality Management
CWA	Clean Water Act
DEQ	Department of Environmental Quality
EPA	Environmental Protection Agency
LAC	Local Advisory Committee
NRCS	Natural Resources Conservation Service
ODA	Oregon Department of Agriculture
OSU	Oregon State University
SWCD	Soil and Water Conservation District
TMDL	Total Maximum Daily Load
USDA	United States Department of Agriculture

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Foreword

This agricultural water quality management (AgWQM) area plan provides guidance for addressing agricultural and rural land water quality issues in the Powder/Brownlee agricultural water quality management area.

The provisions of this AgWQM area plan shall not establish legal requirements or prohibitions.

ODA will exercise its enforcement authority only when reasonable attempts at voluntary solutions have failed (OAR 603-90-0000(4)(e)). In addition, the Department cannot impose a civil penalty for a first violation unless:

- The Department has notified the landowner of the violation and provided the factual basis for its determination of a violation (ORS 568.933(2)(a)), and
- Has provided a reasonable period of time for the landowner to correct the violation (ORS 568.933(2)(b)).

Section 1. Purpose

The purpose of this plan is to address possible water quality limitations on private agricultural and rural land within the Powder/Brownlee management area; in as much as the main stems of the Powder River and Pine Creek and several tributaries are on DEQ's 1998 303(d) list pursuant to the Federal Clean Water Act.

The Local Advisory Committee determined that an extensive plan was not necessary because of the previous work, such as the Powder Basin Temperature Study, done in this basin. Interested readers can obtain a copy of the Powder Basin Temperature Study and all related materials at the Baker County Association of Soil and Water Conservation Districts' office in Baker City and the OSU Extension office. This plan presents a summary of the study in Section 5, "History of Conservation in the Powder/Brownlee management area." This plan relies on the findings of this study, which was conducted to identify factors affecting water temperature in the basin. We will use the results of the study to identify strategies that will minimize the affects of agricultural activities on water temperature. In addition, the Powder Basin Watershed Council has written an assessment of the Pine Creek drainage, and is in the process of developing an action plan.

Mission Statement

The Powder/Brownlee LAC and the SWCDs associated with this plan are committed to:

- Providing leadership for the conservation of the management area's natural resources;
- Promoting the control of soil erosion;
- Promoting and protecting the quality of the state's water;
- Reducing the siltation of stream channels and reservoirs;
- Promoting the wise use of the management area's water and other natural resources;
- Preserving and enhancing wildlife habitat;
- Protecting the tax base; and

- Promoting the health, safety and general welfare of the citizens in the management area through a responsible conservation ethic without depriving county citizens of their economic stability, private property rights and way of life.

Section 2. Goal

The goal of the plan is to:

Attempt to reduce identified water quality limitations on agricultural and rural lands if it is economically and technically feasible.

Section 3. Physical Setting

This area plan applies specifically to agricultural activities on all agricultural, rural, and forest lands within the Powder/Brownlee agricultural water quality management area that are not owned by the federal government. The area plan applies to agricultural lands in current use, those lying idle or on which management has been deferred, and lands (like private roads) not strictly in agricultural use but that support agricultural activities.

Activities governed by the Forest Practices Act are outside the jurisdiction of this area plan and the associated Rules. The Pesticide Control Act (Oregon Revised Statutes Ch. 634) governs pesticide use. ODA Pesticides Division administers those laws.

Most of this management area lies in Baker County, but the northwestern portion of this area lies within Union County. The county line follows the North Powder River, which joins the main stem Powder River at Thief Valley Reservoir, and then the county boundary runs east overland. This area is within the jurisdiction of the Union SWCD. Thus, for purposes of implementing this plan, the Union SWCD will be included with Baker Valley SWCD, Eagle Valley SWCD and Keating SWCD.

Powder Sub-basin

The Powder Sub-basin is bounded on the north by the Grande Ronde Sub-basin and the Wallowa Mountains, on the west by the Blue Mountains, on the south by the Burnt River Sub-basin, and on the east by the Snake River. The Powder River is 144 miles long and drains more than 1,540 square miles before emptying into the Snake River on the Oregon-Idaho border. It begins in the City of Sumpter at the convergence of McCully Fork and Cracker Creek and continues east through Phillips Lake and turns north around Elkhorn Ridge, flowing towards Baker City. Downstream from the town of North Powder, the river flows through Thief Valley reservoir and turns to flow southeastwardly for its remaining 78 miles. It empties into the Brownlee Reservoir near the town of Richland. Brownlee Dam creates the Brownlee Reservoir on the Snake River (Figure 1).

Brownlee Sub-basin

The Brownlee Sub-basin encompasses the northeast corner of Baker County. The primary stream in this sub-basin is Pine Creek. It originates in the Eagle Cap Mountains, descends north to south into a broad plain where it passes the town of Halfway. Soon after, it takes a sharp turn to the northeast and eventually joins the Snake River below Oxbow Dam (Figure 1).

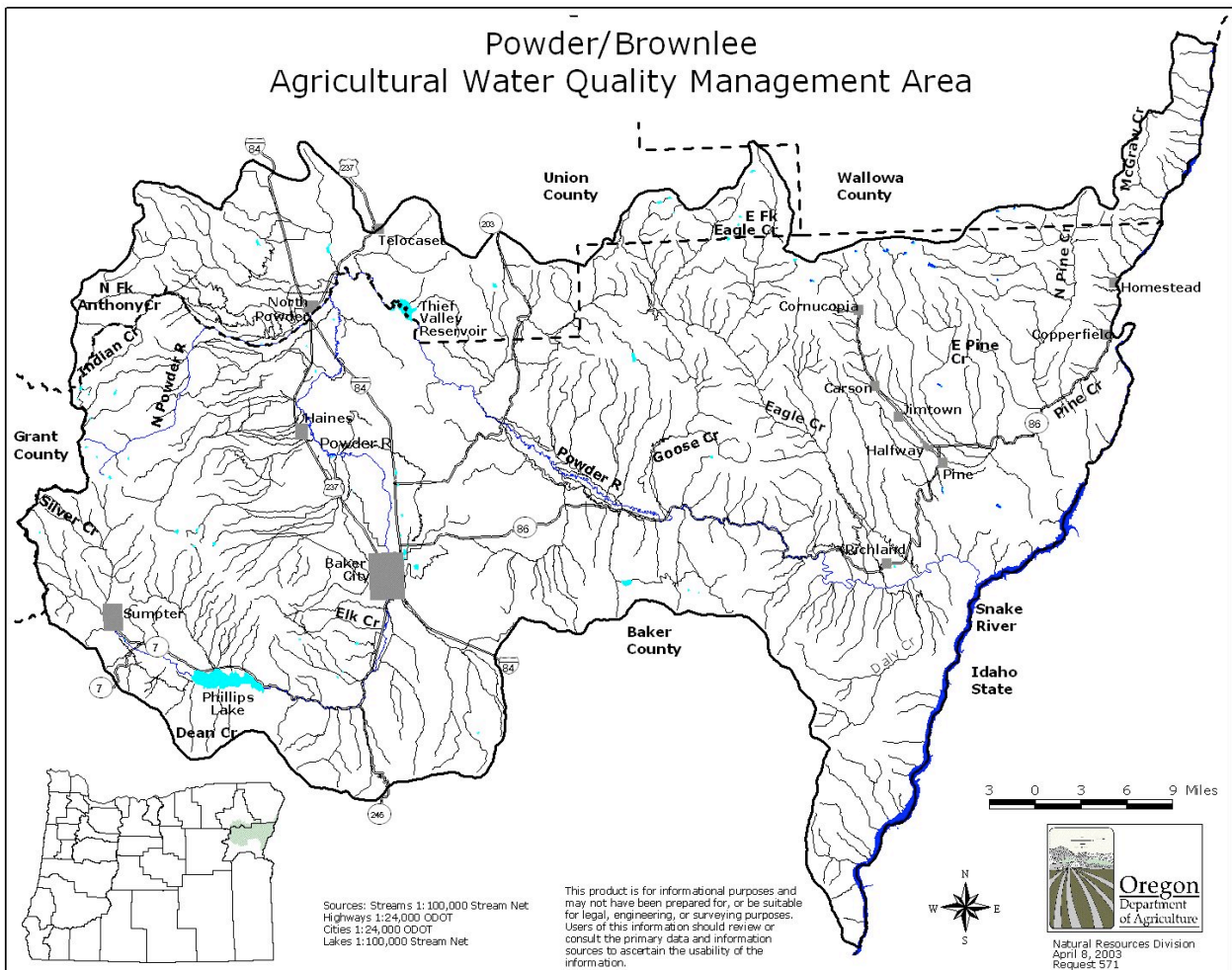


Figure 1. Map of the Powder/Brownlee management area.

Section 4. History of Natural Resource Management in the Powder/Brownlee Management Area

Interested readers can find a description of early settlement activities in Attachment C. The LAC wanted to emphasize that early settlers found many main stem rivers, such as the Powder River, dry in the late summer months. There are diary entries that tell of sheep being driven up the Powder River bed at night, as there was no water between Richland and Keating.

The agriculturists today have water all year due to the installation of impoundment structures. Over the years, local citizens and government agencies have constructed numerous small reservoirs and ponds for irrigation and flood control. This storage capacity has reduced flooding and prolonged the period of time that water flows in the Powder River and some of its tributaries.

Some of the larger impoundments are:

- Phillips Reservoir with a storage capacity of 90,500 acre feet,
- Thief Valley Reservoir with a storage capacity of 17,400 acre feet,
- Wolf Creek Reservoir with a storage capacity of 10,800 acre feet,
- Pilcher Creek Reservoir with a storage capacity of 5,910 acre-feet.

Farmers use all the water in the streams in late summer and have used it since the earliest days of irrigation in Baker Valley. If late season stream flow were to be augmented, additional storage would be necessary. Right now there are several small storage facilities – Rock Creek, Pine Creek, Kilamaque and Van Patten Lakes.

To manage the water supply better in the Powder River Sub-basin, the Oregon Department of Agriculture has reserved about 34,000 acre feet for multi-purpose reservoirs. In the Pine Creek sub-basin 10,000 acre-feet is reserved and in the Eagle Creek sub-basin 4,300 acre-feet is reserved.

Consumptive uses of water in the management area include irrigation, livestock watering and municipal use. Irrigation is the primary consumptive use for which water rights are issued. Non-consumptive uses of water include recreation and fish and wildlife habitat. Sources of appropriated water are reservoirs, surface water and groundwater.

Baker County contains an estimated 176,000 irrigated acres (Oregon Water Resources Department). This includes about 20,000 acres in the Burnt River Irrigation District, which is in another agricultural water quality management area. Irrigation methods include the use of hand lines, wheel lines and pivots. In addition, flood irrigation is still a common practice, especially in livestock pastures. Irrigation withdrawals are most concentrated in the lower portions of each watershed.

Many irrigation or water control districts operate in the Powder Sub-basin. The following four are the largest:

- Baker Valley Irrigation District,
- Lower Powder Irrigation District,
- Powder Valley Water Control District,
- Phillips-Engle Ditch Improvement District.

Not all farmers and ranchers in the management area are part of irrigation districts. For example, the irrigation system on the west side of Baker Valley consists of a large network of ditches that deliver water. Loosely organized neighborhood user groups maintain and repair these ditches. The farmers filed water rights and built the irrigation ditches starting in 1862 and 1863. Eventually they filed for all the available mountain runoff.

Section 5. History of Conservation in the Powder/Brownlee Management Area

In recent years, private landowners, the Baker Valley, Eagle Valley, Keating and Union SWCDs, the Powder Watershed Council, and many others have worked cooperatively to promote and implement conservation. The SWCDs have sponsored workshops and tours dealing with irrigation management, weed control, fish screens and more. They are operating a water quality monitoring program designed to help the districts and landowners learn more about their watersheds. The districts and their partners have sponsored numerous on-the-ground projects. They include:

- Off-stream water developments for livestock
- Confined Animal Feeding Operation improvements
- Soil moisture and weather measurements for irrigation management
- Irrigation pipelines for water and energy conservation
- Wetland and stream rehabilitation for wildlife and water quality improvements

Summary of SWCD Monitoring Data¹

The Baker Valley, Keating and Eagle Valley Soil and Water Conservation Districts have maintained a database of water quality information during 1995-2002. Water temperature and other water quality information were collected at six sites on the upper Powder River main stem between Phillips Reservoir and North Powder, Oregon, seven sites on the lower Powder River main stem located below Thief Valley Reservoir to a site approximately 100 meters above the confluence of the Powder River with Brownlee Reservoir. Four sites were located on Pine Creek and during 2002 sites were also established on Eagle Creek at two places.

The baseline inventory incorporates a sampling design that allows statistical testing with objective results that separate differences between sites located throughout the basin. Differences in water quality samples between sites were stratified for influences due to elevation and distance between sites.

A total of eighteen permanent sites were evaluated to determine the natural heating cycle and increases in water temperatures that occur above the expected natural thermal cycle. Thermal gradients were calculated for sites based on topographic elevation and rates of thermal increase and decrease during the summer periods June, July and August. The detailed temperature records (by hours and days) were compared by sites on a daily, monthly and annual basis using several types of statistical analyses.

Testing results indicate that each site responded to the natural heating and cooling cycle described by the laws of thermodynamics. The Powder River main stem, Wolf Creek, Pine

¹ This summary of the SWCD Monitoring Program was written by Pat Larson, a technical advisor to the LAC. Statements regarding the relative importance of various factors affecting stream temperature are the author's and are not widely accepted by the scientific community. The department does not share the author's conclusion about the temperature standard.

In response to the above paragraph inserted by ODA the Powder/Brownlee LAC stands behind the data collected and analysis performed by Pat Larson. Valid statistical analyses were used employing methods that have been blind peer reviewed and published. We believe that the process and methods employed are more scientifically valid than state models or other reports generated elsewhere.

Creek and Eagle Creek maintained a ubiquitous thermal pattern during each year when the sites were compared.

Stream temperatures increased during the summer months as elevation decreased. The rate of heating below Mason Dam was significantly different than other sites located downstream. Water entering the river system from Mason Dam outlet displays little temperature variation between daytime and nighttime temperatures. In the first 20 miles downstream water temperatures are at or near the temperature standard of 64 °F on a daily basis.

A similar pattern was recorded below Thief Valley Reservoir. Water temperatures remained fairly consistent on a daily basis with minimal variation between the overnight low and maximum temperatures throughout the years 1995-2002.

Monthly water temperature differences in 1995 through 2002 were strongly associated with air temperature differences. Water temperature patterns followed air temperature patterns consistent with the decrease in elevation and decreases in stream velocity through reaches with high sinuosity. All sites displayed stream temperatures patterns reflective of the climatic influences associated with the Baker Valley geographic location.

The data indicated that the minimum overnight water temperatures are a major factor governing water temperatures. If the 5 a.m. water temperatures are above 64 °F, it is not possible for the daily maximum to cool and drop below 64 °F during the day. Overnight temperatures are governed by the air temperatures over the area during the 5 p.m. to 5 a.m. period.

Meteorological conditions were dominant when compared to existing anthropogenic attributes that may influence water temperature in the Powder River watershed. Climatic conditions determine the feasible range of water temperature and are a dominant component of the equilibrium temperature for the environment.

None of the segments were identified as having skewed patterns outside of the natural heating limits. It is likely that the state temperature standards are inappropriate for the Baker SWCD area, and needs to be refined to better reflect the local environment and focus on the land activities should be replaced with a focus on water conditions exhibited in the sampling records caused by natural factors.

Thermal pollution due to insufficient riparian vegetation within the study area was not verified in the data testing. There was no evidence of a thermal pollution problem when sites were tested for the time involved in temperature increases at each site. Water temperature increases are not equal to the air temperature increases, but are proportional.

Daily increases in water temperature were summarized by periods during the day: 5 a.m.-9 a.m., 9am-1pm and 1 p.m.-5 p.m. The results of the statistical testing for the daily changes on the Powder Basin sites indicated that the water temperatures generally did not increase until the air temperatures increased 15 °F or more after 5 a.m. when the minimum low water temperature was established. The pattern was consistent throughout the study years at each site throughout the summer months.

The result of air temperatures increasing at least 15 °F before water temperatures increase 1 °F after the overnight low at 5 a.m. is consistent with the thermodynamic principles. The law establishes that a heating process takes place at a measurable rate when a large thermal reservoir is available for the exchange of energy from the highest concentration to the lowest.

The Baker Valley, Keating and Eagle Valley District stream temperature patterns are similar to the results noted on the Burnt River (Borman and Larson, 2002) and other watersheds in Oregon (Larson and Larson, 1997 & 2002).

The Burnt River Study incorporated a model and field data, which demonstrated that, flood irrigation and dam management enhances stream characteristics desirable in the Snake River Province watersheds. Without reservoir storage, the stream flows during the summer and fall would be much lower than current levels.

The Baker Valley, Keating and Eagle Valley District data inventories of nutrients were examined, but analyses were not conducted on the data due to the variability and insufficient number of samples required for comparison of the means. Oregon DEQ data was also examined. Both data sets lack an adequate number of samples to be able to place a 90% confidence in the data.

A different strategy for sampling in future years is recommended. The “grab” type field sampling should be conducted in a way that will account for daily variations and assure a 90% confidence that the sample is not a sampling anomaly.

The effect of the stream temperature and water quality parameters such as phosphate, nitrates, pH, and dissolved oxygen on fish and aquatic life are best evaluated through the research studies focused on adaptations and physiological responses of species to changing stream conditions on a daily basis. Continued monitoring of the streams is needed to establish natural nutrient and stream chemistry levels that will meet the basin beneficial uses.

Section 6. Water Quality Issues of Concern

The complete list of water bodies in the management area that the Environmental Quality Commission has determined to be water quality limited are in Attachment A. Some of the rivers and streams in the Powder/Brownlee management area are listed for:

- Water temperature,
- Bacteria,
- Dissolved oxygen, and
- Flow modification.

Section 7. Beneficial Uses Adversely Affected

The following beneficial uses have been identified as adversely affected in the management area:

- Salmonid fish rearing and spawning (OAR 340-41-762)
- Resident fish and aquatic life (OAR 340-41-762)

The beneficial uses for the Powder/Brownlee Basins are listed in OAR 340-41-762.

Section 8. Water Quality Objectives

To achieve its purpose and goals, the LAC establishes the following water quality related objectives for agricultural land in the management area:

- Objective One-Stream bank erosion remains within expected levels.
- Objective Two-Maintain or improve the ability of riparian vegetation to function within the capabilities of the site.
- Objective Three-Continue and expand the current Baker SWCD's monitoring program.

Section 9. Prevention and Control Measures

Voluntary efforts are the focus of the ODA, the Baker Valley and Eagle Valley, Keating and Union Soil and Water Conservation Districts and the Local Advisory Committee. However, if a particular landowner refuses to correct a verified adverse condition on his or her property the Oregon Department of Agriculture must have a regulatory backstop to ensure pollution control. At the same time, the ODA does not want to mandate or prohibit any specific agricultural activity. To maintain this flexibility, this plan and its associated administrative rules describe Prohibited Conditions.

Interested parties should note that this AgWQM area plan is only a guidance document. By itself it is not regulatory. However, it does refer to administrative rules that set requirements for landowners. To help distinguish between this area plan and its associated rules, all rule language is separated from the rest of the text by solid lines.

The 2001 session of the Oregon State legislature amended the original 1993 Agricultural Water Quality Management Act (SB 1010) law in key areas. The following is an important amendment that describes how ODA may impose a civil penalty for a first violation:

(ORS 568.933)

(2) The department may not impose a civil penalty on a landowner for a first violation under this section unless the department:

- (a) Has notified the landowner of the violation in a writing that describes, with reasonable specificity, the factual basis for the departments' determination that a violation has occurred; and
- (b) Has prescribed a reasonable time for the landowner to correct the violation that may not exceed 30 days after the first notice of a violation, unless the violation requires more than 30 days to correct, in which case the department shall specify a reasonable period of time to correct the violation in a plan of correction issued to the landowner.

OAR 603-095-3640

Prohibited Conditions

- (1) A landowner shall be responsible for only those conditions caused by activities conducted on land owned or managed by the landowner. Criteria do not apply to conditions resulting from unusual weather events or other exceptional circumstances that could not have been reasonably anticipated.

Pollution and Waste Management

SB502 was passed in 1995 stating that ODA would be the state agency responsible for direct regulation of farming activities for protecting water quality. To implement SB502, the Department incorporated ORS 468B.025 and 468B.050 into all of the basin-specific agricultural water quality management administrative rules in the state.

ORS 468B.025 is a state law developed to address water pollution from all sources. A Oregon Attorney General opinion dated September 12, 2000, clarifies that ORS 468B.025 applies to point and non-point source pollution as that term is commonly applied.

It is important to note that the LAC did not write this Condition. ODA is incorporating ORS 468B.025 and 468B.050 by including the following language into the individual basin administrative rules. As this is an existing statute, this rule went into effect when the rules were filed with the Office of the Secretary of State.

OAR 603-095-3640

(2) Pollution and Waste Management

Effective upon adoption, no person subject to these rules shall violate any provision of ORS 468B.025 or ORS 468B.050.²

2

2001 amendment to ORS 568.933

- (2) The department may not impose a civil penalty on a landowner for a first violation under this section unless the department:
- (a) Has notified the landowner of the violation in a writing that describes, with reasonable specificity, the factual basis for the department's determination that a violation has occurred: and
 - (b) Has prescribed a reasonable time for the landowner to correct the violation that may not exceed 30 days after the first notice of a violation, unless the violation requires more than 30 days to correct, in which case the department shall specify a reasonable period of time to correct the violation in a plan of correction issued to the landowner.

ORS 468B.025 Prohibited Activities.

- (1) Except as provided in ORS 468B.050 or 468B.053, no person shall:
- (a) Cause pollution of any waters of the state or place or cause to be placed any wastes in a location where such wastes are likely to escape or be carried into the waters of the state by any means.
 - (b) Discharge any wastes into the waters of the state if the discharge reduces the quality of such waters below the water quality standards established by rule for such waters by the Environmental Quality Commission.
- (2) No person shall violate the conditions of any waste discharge permit issued under ORS 468B.050.
- (3) Violation of subsection (1) or (2) of this section is a public nuisance.

ORS 468B.050 when permit required.

- (1) Except as provided in ORS 468B.053 or 468B.215, without first obtaining a permit from the Director of the Department of Environmental Quality, which permit shall specify applicable effluent limitations, no person shall:
- (a) Discharge any wastes into the waters of the state from any industrial or commercial establishment or activity or any disposal system.
 - (b) Construct, install, modify or operate any disposal system or part thereof or any extension or addition thereto.
 - (c) Increase in volume or strength any wastes in excess of the permissive discharges specified under an existing permit.
 - (d) Construct, install, operate or conduct any industrial, commercial, confined animal feeding operation or other establishment or activity or any extension or modification thereof or addition thereto, the operation or conduct of which would cause an increase in the discharge of wastes into the waters of the state or which would otherwise alter the physical, chemical or biological properties of any waters of the state in any manner not already lawfully authorized.

Streamside Conditions

Maintaining and improving riparian vegetation through proper management is an important factor to help achieve our goal of working toward a reduction in any identified undesirable water quality issues related to agricultural land use practices. Healthy, functioning riparian vegetation communities in the Powder/Brownlee management area will help stabilize stream banks, filter sediments and nutrients, and protect critical aquatic and riparian habitat. Therefore, it is still the goal for all industries, cities, agriculture and other groups within the management area to reduce any human caused warming of surface waters to the extent it is feasible.

Due to many variables, which naturally occur in eastern Oregon, such as climatic and hydrologic patterns (extreme changes in temperatures, ice jams, very high stream flows, and periods of dewatering), as well as technical and biological challenges (e.g. site capability, beaver, ungulate, and rodent damage) it is unlikely that any of the streams in agricultural areas of the Powder/Brownlee management area will meet the state numeric temperature standards.

OAR 603-095-3640

(3) Streamside Conditions

- (a) By January 1, 2006, activities will allow the establishment and development of riparian vegetation, consistent with site capability. Site capability will be determined by ODA in consultation with local resource management experts.
- (b) Landowners are not responsible for browsing and grazing by wildlife.
- (c) The rule does not specify any activities that must cease and does not require any particular activity to take place.

This rule only applies to the streamside area of natural streams and not to authorized irrigation ditches and diversion points which are used for the primary purpose of delivering irrigation and stock water to lands that hold a valid water right. The streamside area is defined as the area adjacent to the stream where management practices can most directly influence the conditions of the water.

Grazing, weed control and other common agricultural activities are allowed in riparian areas as long as they allow the establishment and development of riparian vegetation, consistent with site capability, to moderate solar heating, stabilize streambanks, and filter sediment and nutrients from overland flows. Minimal breaks in riparian vegetation for essential management activities and infrastructure, such as water gaps, hardened crossings, and irrigation equipment access, are allowed provided site conditions comply with the Prevention and Control Measures.

Section 10. Implementation Strategy

A. Education and Cooperation

(e) Construct or use any new outlet for the discharge of any wastes into the waters of the state.

(2) As used in this section, "confined animal feeding operation" has the meaning given in ORS 468B.205.

Education and cooperation is key to the success of this plan. The local offices of the NRCS, ODA and the Soil and Water Conservation Districts will work together to provide farmers and ranchers in the management area with information about the goals, objectives and requirements of this plan.

Individual farmers and ranchers in the management area may request assistance to determine what can be done to meet the goals and objectives of the plan by contacting the local office of the Baker Valley, Eagle Valley, Keating and Union Soil and Water Conservation Districts or the NRCS.

B. Monitoring And Evaluation

A monitoring program should be developed to:

- Continue and expand, as necessary, existing monitoring to establish baseline conditions (Responsible parties: local SWCDs)
- Track area plan implementation and compliance with the area rules (Responsible parties: ODA, Baker Valley/ Eagle Valley/Keating/Union SWCD, Powder/Brownlee LAC)
- Evaluate area plan effectiveness (improvements in water quality and land conditions) (Responsible parties: ODA, Baker Valley/ Eagle Valley/Keating/Union SWCD, Powder/Brownlee LAC)
- Identify priority areas and annual and long-range strategies for area plan implementation (Responsible parties: ODA, Baker Valley/ Eagle Valley/Keating/Union SWCD, Powder/Brownlee LAC)

Representatives of the LAC, ODA, the SWCDs, and other agencies and groups conducting monitoring in the basin will coordinate water quality monitoring. Area plan success will be evaluated by the LAC, ODA, and the SWCDs.

The Oregon Plan for Salmon and Watersheds' Water Quality Monitoring Technical Guide Book (July, 1999) is the state's preferred reference manual. Specific monitoring protocols will depend on the condition being assessed.

C. Baseline Conditions

The LAC believes that the existing monitoring system needs to be continued. The data already collected provides documentation of current conditions. Continued monitoring will help determine trends in water quality. If problems are noted in the monitoring data, the SWCDs will be notified and they will provide assistance. Funding is a critical issue. The SWCDs depend on grant money to continue their monitoring program.

The SWCDs and ODA are responsible for implementing the area plan. The Baker Valley, Eagle Valley and Keating SWCDs, as the LMAs, will maintain a Memorandum of Agreement with ODA that outlines their responsibilities for providing educational outreach and technical assistance.

The Baker Valley, Eagle Valley and Keating SWCD will:

- Participate in developing and evaluating outreach and education programs designed to provide public awareness and understanding of water quality issues.
- Review reports, projects, demonstrations and tours used to showcase successful management practices and systems.
- Evaluate the adequacy of technical and financial assistance sources available to the agricultural community to implement recommended best management practices, monitoring and education.

Area Plan Progress and Success

The SWCDs, ODA and the LAC are responsible for determining whether the goals will be met within the time frames identified in the area plan. Progress and success of implementation efforts will be assessed through compliance with area rules and State standards and the measurement of water quality changes over time. Monitoring methods will be determined before the next review of this area plan, when the specific targets are better understood and quantified. Two types of monitoring are described below. The appropriate monitoring design depends on the purpose for monitoring.

Trend monitoring will be used to determine long-term changes in water quality. It requires the establishment of "stable" sites and collection of a data record over time for comparison to baseline or initial information. Ideally, areas picked for baseline monitoring will also be used for trend monitoring. In the Powder/Brownlee area most of these sites have already been established.

The *Monitoring Technical Guide Book* provides detailed information on how to set up and perform water quality monitoring, including considerations for site selection, quality assurance, quality control, and data storage. When combined with compliance monitoring, trend monitoring can indicate improvement in water quality conditions related to changes in land use practices.

Compliance monitoring. ODA will review the water quality data collected in the Powder/Brownlee on a regular basis. As part of its determination of basin-wide compliance ODA will consider such things as expected annual averages for the area, "normal" daily fluctuations in temperature, trends over time and other factors. DEQ also conducts monitoring to determine compliance with State water quality standards.

D. Supporting Measures

Before the next review of this area plan, ODA and the SWCDs may develop a map of general vegetative site capability.

Section 11. Schedule for Implementation

The following should be the schedule for implementation to comply with the time frames established by this plan:

A. Plan Period

This plan should be put into full effect over a period of two years from the date of its adoption until which time ODA, the LAC, and the SWCDs anticipate meaningful progress toward achievement of the stated objectives.

B. Management Objectives

This plan encourages farmers and ranchers to manage their land to control conditions that have been identified as contributing to undesirable water quality using adaptive management techniques that should go into effect as of the date and time identified in each condition.

C. Monitoring

Water quality monitoring in the Powder/Brownlee began in 1995, and will continue for the foreseeable future.

D. Reporting and Amendment

The LAC, ODA and the SWCDs will conduct biennial reviews of the progress of implementation of the water quality management area plan, including enforcement actions taken, and requests for alternate measures that have been granted and/or denied. The SWCD and ODA will submit annual, written reports to the Board of Agriculture and the director, summarizing any meetings held, advisory committee members present, actions taken, and progress and impediments toward achievement of water quality management area plan goals. If necessary they will provide recommendations to the board and the director regarding modifications to the area plan that may be necessary to achieve water quality goals and objectives.

Section 12. Landowner Participation

The following guidelines apply for landowner participation in implementation and review of the plan:

Landowner Participation and Cooperation

- A. Landowners will receive copies of the plan and monitoring summaries upon request
 1. Comments from the public and landowners will be received and response given.
 2. Adaptive management specific to the landowners' needs should be used to strive to avoid conditions of Section 9.
 3. Landowners and producers will be offered the opportunity for adaptive management
- B. Property rights will be observed as guaranteed by the US and Oregon Constitution.
- C. Landowners will maintain ownership of data collected by them or their agents on their property.

- D. Assistance for problem resolutions will be provided by the SWCDs to landowners upon request.
- E. Background information and research publications relevant to the water quality issues should be made available by the SWCDs.
- F. Specialized assistance from professional scientists, researchers, extension agents or others will be sought by ODA and the SWCD when questions and concerns require such assistance.
- G. ODA will assist the landowner in data interpretation, or other information.
- H. Secondary characteristics of soil type, hydraulic function, plant community, geological attributes or other factors can be used to compliment any data and data analysis that meets the goals and objectives of the plan in these areas.
- I. Landowners may provide information and/or cooperation and maintain options to adapt management actions that meet the plan objectives.

Section 13. Enforcement Process and Resolution of Complaints

The Oregon Department of Agriculture will have the responsibility for enforcing rules derived from the AgWQM area plan. Fines and civil penalties are used as a last resort in the effort to address management impacts on water quality. This is consistent with the direction given to the Department through the administrative rules for the Agricultural Water Quality Management Program (OAR 603-090-0000 through 603-090-0120). This plan includes an enforcement policy because it is a required element of a Water Quality Plan and to provide a mechanism when reasonable attempts at voluntary solutions have failed.

The primary focus of the AgWQM area plan is education toward voluntary compliance with the plan, and even the enforcement procedure is designed to educate first and penalize only as a last resort. In the event that a situation comes to the attention of the ODA, which may be in violation of the Ag WQM area rules, certain procedures will be followed, as indicated in OAR 603-095-0010 through 0040 and OAR 603-090-0000 through 0120.

The following is a general summary of the procedures: Except for flagrant³ discharge of pollutants or flagrant removal of riparian vegetation necessary for stream bank stability and shading, at any point in the process, the landowner may choose to address a problem and not incur civil penalties under the basin rules. Appendix D provides a flowchart that describes the process in more detail.

#1. Any person alleging a violation of the AgWQM area rules may file a complaint with the ODA. The department will evaluate a complaint filed by a person if the complaint is in writing, signed and dated by the complainant. It must indicate the location and description of the alleged violation of the basin's AgWQM area rules.

³ As defined in OAR 340-012-0030 - any documented violation where the respondent had actual knowledge of the law and had consciously set out to commit the violation.

#2. If after evaluating the complaint ODA determines there might be a possible violation, ODA will contact the landowner, manager or lessee to schedule a meeting. In addition, ODA will contact the LAC Chair when reasonable time allows.

Prior to the meeting ODA will:

- a) Provide a summary of the complaint to the landowner,
- b) Inform the landowner of their right under the Public Records Law (ORS 192.410 through 505) and Public Information Administrative Rule (OAR 603-001-0125 through 0155) to file for a complete copy of the complaint, including name of complainant,
- c) Provide adequate time (30 days) for the landowner, if they desire, to:
 - 1) Contact other experts and
 - 2) Request the SWCD to obtain site specific water quality monitoring data (except in cases where it appears to be a flagrant violation in need of immediate attention),
- d) Inform the landowner that ODA will not enter the property to gather information without permission or a search warrant.

#3. The alleged violation will be reviewed on site by the ODA representative and the landowner. The landowner may invite members of the LAC or the SWCD or any other person to be present at this visit. The on-site review will include an investigation by the ODA, which will include collection of samples as appropriate, for testing and consultation with experts at the ODA expense. In the case of an alleged violation in the Powder/Brownlee management area where extensive monitoring data has been collected, ODA will review this data. ODA will consider such things as expected annual averages for the area, “normal” daily fluctuations in temperature, trends over time and other factors. If no violation of the basin AgWQM area rules exists, the complaint will be dropped.

#4. If the ODA determines through the investigation, based on scientific data, that a violation of the basin AgWQM Administrative rule exists, the ODA will advise the landowner of the violation and work with the landowner and other experts the landowner may want to involve to develop a Plan of Correction to resolve the problem. The Plan of Correction includes a timetable of specific actions and an agreement to revisit the site as necessary to confirm that progress is being made to correct the violation within the timetable agreed upon. If progress is being made on schedule, this will complete the process.

#5. If the landowner does not agree to the specific actions required by the ODA, the landowner may request a review under the procedures outlined in OAR 603-090-0040 through 603-090-0050. The ODA shall determine whether alternate measures proposed by the landowner are sufficient to protect water quality.

#6. If there is a confirmed violation that a landowner refuses to address after the department’s on-site visit and the department attempts to work with the landowner to develop a mutually agreeable solution civil penalties can be levied. Civil penalties are issued by the ODA director or the director’s designee under the provisions of OAR 603-090-0060 through 603-090-0120 and will be based on the seriousness of the violation and the magnitude of the effect. OAR 603-090-0120(3) describes the civil penalty matrix for first violations which begins at \$50 and ranges to \$1200, and the civil penalty matrix for repeat violations which begins at \$100 and ranges to \$5000.

#7. A landowner issued a civil penalty due to a violation of the basin AgWQM area rules may request an informal conference with the Director of the ODA. The conference provides an opportunity for the landowner to present their perspective and may result in a settlement.

#8. A landowner issued a civil penalty due to a violation of the basin AgWQM area rules may request a formal hearing by an independent hearings officer assigned from the Office of Administrative Hearings in accordance with applicable contested case procedures as described in ORS 183.413 to 183.550.

#9. A landowner may appeal the outcome of a formal hearing concerning a civil penalty by filing a petition with the Oregon Court of Appeals. The court will consider whether the ODA has properly interpreted the applicable law and has acted within the discretion delegated by law that is consistent with agency rule, official agency position or prior practice. The court may also assess whether the ODA action is based on substantial evidence and is consistent with the constitution.

APPENDIX A

WATERBODIES IN THE POWDER RIVER/BROWNLEE RESERVOIR SUBBASINS ON THE 1998 303(d) LIST

BROWNLEE RESERVOIR SUBBASIN

Water body Name	Boundaries	Parameter
Aspen Creek	Mouth to headwaters	Temperature
Beecher Creek	Mouth to headwaters	Temperature
Big Elk Creek	Mouth to headwaters	Temperature
Clear Creek	RM 9 to headwaters	Temperature
East Pine Creek	Mouth to Okanogan Creek	Temperature
East Pine Creek	Okanogan Creek to Headwaters	Temperature
Elk Creek	Mouth to headwaters	Temperature
Lake Fork Creek	Mouth to Pole Creek	Temperature
Meadow Creek	Mouth to upper end of Schneider Meadows	Temperature
Okanogan Creek	Mouth to Unnamed Stream at Section 35 NW 1/4	Temperature
Pine Creek	Clear Creek to Pine Creek, East Fork	Temperature
Pine Creek	Mouth to Clear Creek	Temperature
Pine Creek	Pine Creek, East Fork to headwaters	Temperature
Pine Creek	Mouth to headwaters	Temperature
Trail Creek	Mouth to headwaters	Temperature
Trinity Creek	Mouth to West Fork	Temperature

POWDER RIVER SUBBASIN

Water body Name	Boundaries	Parameter
California Gulch	Mouth to Headwaters	Temperature
Dean Creek	Mouth to Headwaters	Temperature
Eagle Creek	Mouth to East Fork	Temperature
East Fork Goose Creek	Mouth to Phillips-Ingle Ditch	Turbidity
Elk Creek	Mouth to Baker City Municipal Diversion	Temperature
Indian Creek	Mouth to Headwaters	Temperature
North Fork Anthony Creek	Mouth to Headwaters	Temperature
North Powder River	Mouth to National Forest Boundary	Temperature
Powder River	Mouth to Thief Valley Reservoir	Temperature
Powder River	Thief Valley Reservoir to Sutton Creek	Temperature
Powder River	Thief Valley Reservoir to Sutton Creek	Bacteria
Powder River	Sutton Creek to National Forest Boundary	Bacteria
Powder River	Mouth to Thief Valley Reservoir	Bacteria
Powder River	Mouth to Thief Valley Reservoir	Flow Modification
Powder River	Mouth to Thief Valley Reservoir	Dissolved Oxygen
Silver Creek	Mouth to Headwaters	Temperature
West Fork Eagle Creek	Mouth to headwaters	Temperature

APPENDIX B

DEFINITIONS

“Pollution” has the meaning given in ORS 468B.005(3) which states: such alteration of the physical, chemical or biological properties of any waters of the state, including change in temperature, taste, color, turbidity, silt or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive or other substance into any waters of the state, which will or tends to, either by itself or in connection with any other substance, create a public nuisance or which will or tends to render such waters harmful, detrimental or injurious to public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational or other legitimate beneficial uses or to livestock, wildlife, fish or other aquatic life or the habitat thereof.

“Wastes” has the meaning given in ORS 468B.005(7) which states: sewage, industrial wastes, and all other liquid, gaseous, solid, radioactive or other substances which will or may cause pollution or tend to cause pollution of any waters of the state. Other substances, which will or may cause pollution, include commercial fertilizers, soil amendments, composts, animal wastes and vegetative materials.

“Adaptive management” means making adjustments in management based on feedback from monitoring.

APPENDIX C

HISTORY OF IRRIGATION MANAGEMENT IN THE POWDER/BROWNLEE MANAGEMENT AREA

People have been irrigating crops in the Powder/Brownlee management area for many years. Isaac Hiatt, writing a history of the county in 1893, said that a limited amount of irrigation had occurred since the first pioneers settled in the area in the early 1860s, but that no extensive irrigation projects had been started up to that time. He speculated that “when the time comes that water is no longer needed for mining purposes the ditches may be of more permanent value to the county by using the water for irrigating the land to which it can be conveyed.” This is indeed what happened. The early miners dug an extensive array of ditches, and when mining stopped farmers and ranchers used these ditches to bring water to their fields. Some of the ditches are still used today.

Hiatt envisioned a series of reservoirs at the head of the ditches to supply water through the growing season. His writings contain lengthy discussions of flooding and drought. For example, in June 1862 a party of settlers came to the junction of the North Powder and Powder Rivers and could not cross because of the water flowing out over the valley. They had to move upstream and constructed the first bridge across the Powder River, which soon became a toll bridge. However, the next spring in 1863 water was so short the miners were squabbling over the supply. Because of this shortage Hiatt reported that the first “right to water” was filed in 1863 by a group of miners. They claimed 250 inches from Elk Creek.

The early settlers recognized the potential for agriculture in the management area if water could be brought to where it was needed. For example Hiatt (1893) wrote that some farmers in the Powder River Valley had converted sagebrush and greasewood into “the best meadow land. These are examples of what can be done by cultivating and irrigating.” He estimated the potential number of irrigated acres could be 221,000, which is very close to today’s 176,000 acres under irrigation.

The Baker Irrigation project was begun by private entities in the 1890s. This initial work consisted of building several small canals to deliver water to the fields. The Baker Irrigation District was formed in the 1930s and one of the first projects was to construct the Lilley Canal and the Lilley Pumping plant, which are located about 10 miles north of Baker City on the Powder River. In most years irrigation water ran short by the end of the season, so in 1967 Mason Dam was constructed and it created Phillips Reservoir.

In the lower Powder River area, irrigators began organizing ditch companies in the 1880s. The first was the Basche Ditch. The Lower Powder Irrigation District is thought to have been established in the 1930’s. The districts’ purpose was to distribute irrigation water to the farmlands in the Keating valley. The Thief Valley Dam, the irrigation districts’ only storage facility, was constructed in the early 1930’s. Thief Valley was the first dam built on the Powder River. It is not considered to be a multipurpose reservoir. The irrigators can completely drain the reservoir if they want.

The irrigation district delivers water from the reservoir via the lower Powder River where there are 3 smaller dams used to divert water into canals. Currently, the District includes 32 users and supports 7,300 irrigated acres.

The Powder Valley Water Control District was formed in 1962. It incorporates property in both Baker and Union Counties and covers about 350 square miles. Its function is to provide irrigation water to roughly 15,000 acres.

Much of the water for the Powder Valley Water Control District is supplied by Wolf Creek and Pilcher Creek reservoirs. The Wolf Creek dam is five miles northwest of North Powder. Construction was completed in 1975. Pilcher Creek dam impounds Pilcher Creek about seven miles west of North Powder. Several pipelines are part of the district, and they help distribute water to the irrigators. Using pipelines allows gravity pressure to run sprinklers.

When water runs short it is divided among the irrigators by priority date. The earliest dates have the highest priority. Those irrigators on the west side of Baker Valley with priority dates of 1874 or older generally have water nearly all irrigation season. Those with 1880 through 1890 water rights have water early in the season during high stream flow times. Generally, the later water rights, 1900 and after, are served for only a short time and do not necessarily get served every year. Late in the summer on some creeks water becomes so scarce that only small heads of water are put into each ditch to provide drinking water for livestock.

History of natural resource management in the Powder/Brownlee management area

One of the earliest recorded explorations of the Powder River area was in 1811. Wilson Price Hunt, led the John Jacob Astor overland expedition, and passed through Baker Valley known then as The Lone Tree Valley. Hunt is responsible for the first crossing the Blue Mountains to the Columbia, thus establishing a passage for the western end of the Oregon Trail, the major travel route to the West. He arrived in Astoria in 1812.

The purpose of these early expeditions was to find beaver and establish trading posts. Beaver populations declined rapidly during this time, but they have since recovered to some extent in recent years.

From 1841 through 1869 more than 250,000 Americans took the Oregon Trail to the West, starting their journey in Independence, Missouri. Nearing the end of their journey, they arrived at Farewell Bend on the Snake River and proceeded to conquer the treacherous Burnt River Canyon. The Trail ahead led them across Virtue Flat to Flagstaff Hill and into Powder River Valley.

In August 1845, a group of wagons led by Stephen Meek left the Oregon Trail for a shortcut to western Oregon. After suffering many hardships and deaths, the survivors reached The Dalles in October. While camped at a tributary of the John Day River, small yellow pebbles were found along the water's edge. Not realizing that the pebbles were gold, they were left behind in an old blue bucket and the legend of the "Lost Blue Bucket Mine" was born.

In 1861 gold was discovered in Baker County. Four men, searching for the fabled "Lost Blue Bucket Mine," found gold in Griffin Gulch, south of where Baker City is now located.

In the spring of 1862, the town of Auburn was laid out in Blue Canyon and soon grew to a population of about 5,000 people. Several other towns were founded in the same year.

At roughly this same time, the first farms and ranches were established in the area to feed the miners and town people. Some examples of the early agricultural activities follow.

Cowboys named Knight, Abbott and Packwood drove a herd of cattle to supply beef to people in the area in the summer 1861. They crossed the Snake River in the Brownlee area and came upon a major tributary to the Powder River. They happened to shoot an eagle here and named the tributary Eagle Creek (Hiatt, 1893).

On June 16, 1862 Hardin Estes and Fred Dill filed the first claim to the Powder River Valley, and they started a ranch near Washington Gulch. William Baldock arrived in September 1862 and saw an abundance of wild grass. He found a market for hay and cut many tons by hand that fall and winter. He charged between \$50 and \$60 per ton, and he had \$400 in cash after expenses and providing for his family that winter (Hiatt, 1893).

Joseph Kinnison came to the Powder River Valley in July 1862, and according to Hiatt (1893) he was the first to "plow a furrow" in Baker County the following spring of 1863. He had 40 acres in cultivation and grew a variety vegetables and other produce. Despite a late spring frost, he had a successful first year and made \$4,000.

To facilitate mining, agricultural activities and transportation, settlers began to build roads and ditches. For example, in 1863 the Sisley Toll Road was built from Weatherby to connect with the Old's Ferry Toll Road to the Snake River and the Old's Ferry. In the same year the 125 mile long Eldorado Ditch, probably the world's longest hand-dug ditch was surveyed and started.

For the next 20 years or so the work of development continued at a steady pace. The local economy got a boost when in 1884 prospectors discovered gold near Cornucopia and the transcontinental railroad reached Baker City. By 1890 the population of Baker City was 6,663, larger than either Boise or Spokane.

Settlers had been logging from the beginning to build their houses, some land clearing for farming and for mining activities. Commercial logging began growing in the 1880s and 90s. Evidence of this is that in 1890 the Sumpter Valley Railway was incorporated to carry logs from Sumpter Valley to the Baker City sawmills, and in 1892 the Oregon Lumber Company completed a sawmill in Baker City. By 1896 the Sumpter Valley Railroad reached Sumpter. By 1901, the population of Sumpter was 3,000 with over 80 businesses.

Agriculture in the area was expanding. As noted in the irrigation section, the Baker irrigation project was begun in the 1890s. An example of the importance of agriculture was that the

Sumpter Valley Railroad was extended to Prairie City in 1910 to serve ranchers and farmers as well as lumber and mining.

Grazing

Skinner Kirby (1989) and Ernest Hudspeth (1979) have written personal accounts of ranching life in the early 1900's. Both of these memoirs are rich in detail about every day life. The summary that follows highlights some of their relevant observations.

They describe activities of homesteaders clearing small plots of land to grow vegetables and some hay. They sold or traded excess produce to stores in town, and in return they got flour, salt, sugar and other items they could not produce themselves. Each family raised a few pigs, chickens and cows for meat.

Kirby (1989) wrote about his father working for several cattle operations in addition to running his own small place. The herds were large, a 1,000 head or more. It was also common for people like the Kirby family to buy cows from the Malheur area and drive them into the Baker Valley to graze in the summer and be sold that fall. As Kirby said "The range was wide open, and grass was plentiful."

Kirby described the range conditions prior to 1916 as the grass being stirrup high, with very little sagebrush and no cheat grass. He said, "its hard for people today to imagine how the grass and flowers were at that time."

In time cattle and sheep herds became so large that intense competition for range occurred. Livestock were harassed and killed, fistfights were common and a few people were murdered because of the range wars. Kirby attests that the Homestead Act of 1916 made things worse. More people arrived and sheep and cattle herds grew.

The grass was being overgrazed and cheat grass was increasing. Kirby called this the beginning of the "Great Change."

"No one seemed to care anything about it, just dog-eat-dog, and grab here and there to get along until the hills were crawling with cattle, sheep and horses."

Kirby estimated that in the 1920s and 30s there were about 100 bands of sheep in Baker County. If a typical band was around 1,200 that means there were more than 100,000 sheep in the area.

However, Kirby attributed as much as 50 percent of the damage to uncared for horses roaming the range year round. Thousands of horses were loose, and many began to suffer from starvation. In 1926, the Humane Society pushed to have the horses gathered. In the spring of 1927, local ranchers worked together to gather the horses. Kirby participated in a roundup of nearly 7,000 animals.

Range conditions were getting so bad in the west that in 1934 Congress passed the Taylor Grazing Act. One of the main purposes of the Act was to stop transient livestock operators from

grazing the public lands. The range was divided into allotments and each allotment assigned to an operator with an allowable number of livestock. Kirby, writing in 1989, felt that much progress had been made in restoring the range, but much more work remained to be done.

Crop production

The livestock industry has always been the dominant agricultural industry in the management area. However, ever since Joseph Kinnison started his small produce farm in 1863 a variety of crops have been grown in the Baker area. The first farmers, like Kinnison, grew produce for local markets or for their own consumption. Hiatt (1893) said that farmers were called “begas” because they sold rutabagas to the miners the second winter after the first gold discovery. The next year the farmers produced too many rutabagas and ruined the market.

Homesteaders arriving at the turn of the century continued this style of farming. Kirby (1989) recalled his mother and father growing a wide variety of crops on their small homestead mostly for themselves to eat. Potatoes were their main cash crop.

Some produce was shipped out of the area. Hiatt (1893) wrote about orchards shipping thousands of boxes of fruit out on the Snake River. The main orchard producing areas were along the Snake River, north and south from what is now Huntington.

As more and more irrigation projects were completed, more acres of rangeland were converted to cropland. Hay was the primary crop. Farmers also grew a significant amount of dry land crops such as winter wheat.

Thirty to forty years ago there were many more acres of wheat grown in the management area than there are today. As of 2001, wheat accounted for only three percent of agricultural commodity sales in Baker County. Local residents believe that climate change has caused some of the reduction in wheat production. Hiatt (1893), Kirby (1989) and Hudspeth (1979) described frequent heavy snows and very cold temperatures that are rarely seen today. So it may be that the climate has shifted to be warmer and dryer.

Mining industry

The mining industry was beginning to have trouble in the 1910s. Miners began looking for new ways of extracting gold and other minerals. Dredging in the Sumpter Valley began in 1913, temporarily revitalizing the industry. Evidence of past mining is still seen in the dredge tailings lining the lower stretches of McCully Fork and Cracker Creek and covering the flood plain of the Powder River from Sumpter to Phillips Lake.

Besides the dredge tailings, the effects of the dredging are still felt today. A tremendous amount of silt was transported through the river system because of the dredging. Long time residents observed that the Powder ran muddy all year when the dredge was in operation. Much of the silt in Thief Valley Reservoir came from the dredging operations. The irrigation district has worked with DEQ to reduce turbidity problems when the reservoir is emptied. The silt collected in other parts of the valley too, and has changed the configuration of the river.

A fire, which started in the kitchen of the Capital Hotel, destroyed much of Sumpter. The town's water supply failed thirty minutes after the start of the fire and dynamite was finally used to stop the flames. The fire, combined with the shutdown of the gold mines, ended the boom in Sumpter. The year was 1917.

The Sumpter Valley Railroad stayed to serve the agricultural and lumbering needs of the communities, and with the more modern machinery they were able to re-work some of the huge dumps of rock. The community also was shortly revived during the thirties depression period when the price of gold rose and some of the mining activity returned, but with the advent of World War II, the prosperity of the old mining regions began to fade.

The source of the material in this section was the Dictionary of Oregon History and the Baker County Historical Society.

History of conservation in the Powder/Brownlee management area

Landowners in the Powder/Brownlee management area have been practicing good stewardship for many, many years. This section of the Plan highlights a few projects to show the concern local citizens have for the well being of their watershed.

One issue is installing fish screens in this area. The Eagle Valley SWCD, NRCS and ODFW have worked to encourage landowners to install fish screens and have helped them put several in place.

Recently the Baker Irrigation District participated in a project to put in two miles of pipe. This pipe eliminated three diversion dams, replaced eight canals with one screened diversion and resulted in 20 miles of open river.