CHAPTER 2
EXISTING RESOURCE CONDITIONS

2.1 ASSESSMENT OF THE NEED FOR CHANGE

The Banks Lake management area has a rich diversity of natural resources and is recognized locally and regionally for its outstanding recreation opportunities. The reservoir's clear water and spectacular scenery attract over one-half million visitors each year to enjoy fishing, camping, swimming, boating, wildlife observation, and other recreational opportunities. There is an inherent need for a comprehensive management plan in the management area to conserve and protect the land and water resources so the public may continue to enjoy all the recreational opportunities available at Banks Lake.

Arid ecosystems, like the lands surrounding Banks Lake, tend to be more susceptible to human disturbance and require longer periods of time to recover than do wetter areas that receive more rainfall. Drier landscapes usually require restoration to expedite vegetative succession, but some disturbed areas never recover, even with restoration. Other factors influencing the fragility of the acreage around Banks Lake reservoir include precipitation events and erosion. While xeric landscapes receive little rainfall annually (< 12"/year) compared to other mesic areas, the precipitation events are characterized by short, intense thunderstorms when they occur. These storm bursts inevitably wash the soil into the reservoir, and water resources/quality begin to be effected. Arid landscapes are prone to erosion, and the soil loss is rapid following the disturbance. Consequently, land use effects water resources and visa versa. Proper land and water management practices will prevent or reduce potential environmental and resource-related problems. The implementation of a RMP for Banks Lake management area will only further contribute to the uniqueness of the area by providing a safe and beautiful place for people and natural resources to exist together.

2.2 NATURAL RESOURCE SUMMARY

This chapter summarizes existing resource conditions in the Banks Lake management area. Natural, cultural, and aesthetic resources are addressed followed by a general description of the local and regional management area relative to social and economic resources. The presence of hazardous and toxic materials of concern are also identified and described.

Banks Lake is the northernmost unit managed by the WDFW under the Columbia Basin Wildlife Area (CBWA) Management Plan. The CBWA includes eastern Washington lands within Grant, Adams, Franklin, and Douglas Counties. Most of the management units encompass lands developed as a result of Reclamation's Columbia Basin Project. The WDFW owns 43,000 acres fee title, leases some tracts from the WDNR, and has agreements for management of federal lands with the FWS, the U.S. Department of Energy (USDOE), the Bureau of Land Management (BLM), and Reclamation. The WDFW manages a total of 260,000 acres under the plan. To date, no specific CBWA management plan for the Banks Lake unit has been developed.

2.2.1 Climate

The Cascade Range and the Rocky Mountains greatly influence the climate in the Columbia Basin and Banks Lake management area. The Rocky Mountains shield the Columbia Basin from the more severe winter storms moving southward across Canada, while the Cascade Range forms a barrier to the easterly movement of moist air from the Pacific Ocean (SCS, 1984). However, some air from each of these sources reaches the Columbia Basin and affects the climate at Banks Lake.

Due to Pacific high pressure systems from May through September, the recreation season is generally hot and dry. From late June until September, sunshine is abundant. Summer precipitation mainly occurs either as brief showers or as short, intense thunderstorms. Short periods of rainfall occur from July through September and average about 0.5 inches per month. Rain typically falls again in October, after the peak recreation season. This is followed by an Indian Summer with cool, sunny days and crisp, cold nights. In winter, the ground is often covered with snow. Mean monthly temperatures from November through April range between 29 and 50°F. However, Chinook winds, which blow downslope and are warm and dry, often melt and evaporate the snow (SCS, 1984). Spring comes late in March and is typically cool and wet.

Mean annual precipitation at Banks Lake is approximately 10.4 inches. The average annual snowfall is about 20 inches with the greatest snowfall occurring in December (averages 5.9 inches) and January (averages 7.9 inches). August and September are normally the driest months of the year; January, May, November, and December are normally the wettest.

The prevailing winds are from the southwest during summer with about six thunderstorms generally occurring during the season. Winds from the northwest typically are associated with winter storms. The water at Banks Lake can be extremely rough and dangerous within minutes of a storm's approach, requiring boaters to seek shoreline refuge as quickly as possible. This is less of a concern along the central portion of the reservoir which is more sheltered from adverse wind conditions.

Strong winds are usually aligned in the direction of major storm movements. Most major storm movements are from the west or southwest. The intensity and the direction of the wind is often determined by the surrounding terrain and coulee walls. As a rule, most winds come from the southwest and light winds, those less than 12 miles per hour, outnumber strong winds.

2.2.2 Air Quality

The Banks Lake management area is under the jurisdiction of the Washington Department of Ecology's (WDOE) Eastern Regional Air Pollution Control Authority Office. Washington's air monitoring network measures ambient air quality near population centers in selected areas of the state; the closest monitoring sites to Banks Lake are Spokane to the east and Yakima to the southwest.

Air quality in the management area is very high (well below ambient air quality standards for criteria pollutants) due to the absence of nearby point sources, such as commercial and/or

industrial facilities. Air pollutant sources which periodically occur in or near the management area include wildfires, campfires, prescribed burns, fugitive and/or agricultural windblown dust, and mobile emissions from motor vehicles, aircraft, trains, watercraft, and construction. These emissions are generally of short duration and have not resulted in pollution problems due to high dispersion rates found in the area.

Class I areas have the highest air quality classification and include all international parks, wilderness areas, memorial parks which exceed 5,000 acres, and all national parks which exceed 6,000 acres. Class I areas have land and resource use restrictions to prevent damage to visibility, plant, soil, and other resources. The closest Class I area to Banks Lake is the Spokane Indian Reservation to the east. WDOE's plans for protecting and improving visibility in Class I areas are contained in the air quality State Implementation Plan (SIP).

2.2.3 Geology

Banks Lake is situated in the central portion of eastern Washington State within the Columbia Plateau physiographic province (Fenneman, 1931). The inception of the Columbia Plateau province occurred during the Miocene epoch with vast outpouring of basalt lavas, which created the Columbia River Basalt (CRB) formation. The lavas generally flowed westward into a structural and topographic basin, with some flows reaching the Pacific Ocean. The basalts are essentially horizontal, with minor amounts of interbedded Miocene sediments of various lithologies (USGS, 1989). The CRB formation extends over 500,000 square kilometers in Washington, Oregon, and Idaho and underlies virtually the entire region (USDA, 1973). Overlying the basalts are fluvial, glaciofluvial, and volcanoclastic sediments, and loess of Pliocene to Holocene age. The area has been dissected into many flat-bottomed coulees which have floors that merge with basins and plains to the west (Grolier and Bingham, 1978).

The Grand Coulee's ancestral channel was cut by the Columbia River when it was forced to flow across the lava field by the Okanogan ice lobe of the Vashon continental glacier. When flood waters cascaded down the steep southeast-facing slope of the Coulee monocline, the basalt fold eroded headward forming a typical recessional gorge. Erosion and cataract retreat continued in the upper Grand Coulee until the basalt flows at the coulee head were completely removed, exposing granitic rocks that form the upper coulee floor (U.S. Government Printing Office, 1973).

The Banks Lake management area is situated in the upper Grand Coulee - a box canyon with a nearly horizontal floor and 900 foot vertical basalt walls. Grand Ronde and other basalts older than Wanapum Basalt are found inside the coulee walls. Wanapum Basalts comprise the upland plateau surrounding the coulee walls.

2.2.4 Topography

The landscape of the Banks Lake management area is varied. Rugged basalt coulee walls in the north and central portions of the management area open to the south. Elevations range from approximately 1600 feet (487 m) near Dry Falls Junction at the southern end of the management area to approximately 2300 feet (701 m) in Northrup Canyon. The management area can best

be described in three sections: (1) the north pool area; (2) the middle walled area; and (3) the south pool area.

The north pool area extends from North Dam south to the Steamboat Rock State Park peninsula. In general, the area is a large pool bordered by steep basalt cliffs containing several unique features. The two most striking features are Steamboat Rock and Northrup Canyon. Steamboat Rock is a 700 foot (213 m) basalt remnant of the cataclysmic flooding that created the Grand Coulee. Northrup Canyon is a narrow closed box canyon bounded by 700-foot-high basalt cliffs and walls. The canyon contains a mosaic of unique natural habitat types of high ecological value. Other north pool area features include Barker Canyon, Castle Rock, and several reservoir bays (Osborn Bay, Jones Bay, Kruks Bay, Old Devils Lake, Devils Punch Bowl, and Barker Cove).

The middle walled area is the most homogenous in the management area. This section extends from where the canyon becomes restricted below the Steamboat Rock peninsula south to where SR 155 exits the upper Grand Coulee (about 3 miles north of Dry Falls Dam). The area is bounded by 750-foot-high (230 m) basalt walls on either side of the reservoir. Aside from Bebe Springs, Martin Falls, and several intermittent waterfalls, there are no especially unique topographic features in the middle portion of the management area.

The south pool area extends from where SR 155 leaves the upper Grand Coulee south to Dry Falls Dam. The east side of the south pool area is characterized by open shrub-steppe and grassland plant communities, rolling hills, and agricultural croplands. The south pool's west side is characterized by 400 foot-high (120 m) basalt walls that open at Dry Falls Dam. Below Dry Falls Dam, basalt outcrops, lakes (Junction Lake, Coulee Lake, and Table Lake), and palustrine wetlands characterize the landscape.

The nearly vertical coulee walls which encompass most of the Banks Lake management area limit human access and activity. Access and travel is easiest on the east side of the reservoir via SR 155. Except in the north pool area (Barker Flat) or in the immediate vicinity of Dry Falls Dam, access to the reservoir's west side is essentially boat access only. Consequently, the majority of the land use and recreational activities occurring at Banks Lake are concentrated on the reservoir's east side, and, more specifically, at the reservoir's north and south ends.

2.2.5 Soils

The most recent and comprehensive soils data available for the management area was obtained from the *Soil Survey of Grant County Washington* (SCS, 1984) and the *Soil Survey of Douglas County Washington* (SCS, 1981) prepared by the U.S. Department of Agriculture's Natural Resources and Conservation Service (NRCS), formerly the Soil Conservation Service (SCS). Revised soils data exist for Douglas County, but these data have not yet been released to the public (Bareither, 1998).

Banks Lake is primarily situated in the northwest corner of Grant County. The Grant/Douglas county line intersects the management area's western boundary at several locations. Soils in the RMP management area consist of three general soil groups; a total of five general soil map units in Grant County; and three general soil map units in Douglas County (see Table 2.1). Each of

the general soil map units identifies broad areas that have a distinctive pattern of soils, relief, drainage, and landscape. Table 2.1 also provides general soil unit description and characteristics for each of the Grant and Douglas county soil map units found in the Banks Lake management area.

Table 2.1
General Soil Map Units, Banks Lake, Washington

Grant County
Soils on terraces, active dunes, and alluvial fans. Primarily found in the northern portion of Banks Lake from Steamboat Rock north to Grand Coulee.
Unit 6: Quincy: Very deep, somewhat excessively drained, nearly level to steep soils; on terraces and active dunes. Soils are fine sand throughout; formed in sand derived from mixed sources.
Unit 9: Farrell-Ellisforde: Very Deep, well drained, nearly level to strongly sloping soils; on terraces.
Soils on benches, terraces, hillsides, and ridgetops in areas of channeled scablands. Dominate soil types found across the entire management area.
Unit 13: Bakeoven-Roloff: Very shallow and moderately deep, well drained, nearly level to very steep soils, on, hillsides, benches, and ridgetops.
Unit 14: Bakeoven-Anders-Benco: Very shallow, moderately deep, and very deep, well drained, nearly level to very steep soils; on ridgetops, hillsides, benches, and terraces
Soils mainly on hills and ridgetops. Found in the extreme southwest corner of the management area north of Dry Falls Dam.
Unit 18: Zen-Lickskillet-Rails: Shallow, moderately deep, and very deep, well drained, nearly level to very steep soils; on hillsides and ridgetops.
Douglas County
Unit 2: Bakeoven-Rock Creek-Lickskillet: Shallow, well drained, gently sloping to moderately steep soils; on basalt uplands and plateaus, mountain side slopes, and ridgetops.
Unit 5: Touhey-Heytou: Very deep and moderately deep, well drained, nearly level to moderately steep soils; on broad basalt plateaus.
Unit 7: Bakeoven-Touhey: Shallow and very deep, well drained, nearly level to steep soils; on basalt plateaus and uplands.

2.2.6 Water

Surface Water Hydrology

The Columbia River is one of the world's largest rivers, draining a basin encompassing about 259,000 square miles in the northwestern United States and southwestern Canada. The river is characterized by heavy, sustained flows during the summer months with the peak flow usually occurring in mid-June. Most of the Columbia basin's water supply comes from the forested slopes of the Rocky Mountains in British Columbia, western Montana, and northern Idaho where snow and heavy rains result in prolonged summer river flows. Based on the 75-year period of record from 1915 through 1989, the average annual discharge of the Columbia River at Grand Coulee Dam was 80 million acre-feet with an average annual flow of 110,000 cubic feet per second (cfs).

The water supply stored at Banks Lake, one of the principal reservoirs of the Columbia Basin Project, is pumped 280 feet from Franklin D. Roosevelt (FDR) Lake by the Grand Coulee Pumping-Generating Plant. Extending southward from the Pumping-Generating Plant, the Project's irrigation works begins with the 1.8 mile-long Feeder Canal which carries water to Banks Lake - an equalizing and storage reservoir for the Project's irrigation system.

Banks Lake is operated and maintained for the storage and delivery of irrigation water to Columbia Basin Project lands; therefore the reservoir levels are fluctuated to meet the irrigation demands and pumping schedules of the Project. The United States reserves the right to vary the reservoir water level at such times to the extent deemed necessary or desirable.

Irrigation diversions made from Banks Lake to meet Columbia Basin Project requirements enter the Main Canal at the Dry Falls Dam headworks. The irrigation season typically extends from mid-March through October and reservoir releases are scheduled by the Columbia Basin Project Office. The lake is not used for flood control purposes since it has a very small, natural drainage area.

Irrigation water pumped from the Columbia River at FDR Lake enters Banks Lake through the Feeder Canal located near the left abutment of North Dam. Water from Banks Lake will flow through the Feeder Canal back into FDR Lake when the pump-generator units are used for electrical power generation. Variations in the operational rates of water supply inflows and outflows result in reservoir water level fluctuations. Banks Lake drawdowns generally begin with the commencement of the irrigation season.

There are no reservoir inflow forecasts made for Banks Lake since it is an offstream storage and equalizing reservoir with very little natural inflow. Under typical reservoir system operations, Banks Lake inflows generally begin in February or March, increase in April and May, peak in June or July, decline from July through October, and are essentially nonexistent from November through January. Over the 18-year (1980 to 1998) analysis period, Banks Lake inflows ranged on average from about 6,500 acre-feet in November up to about 475,000 acre-feet in July.

Policies for managing the water level at Banks Lake have changed several times since reservoir construction. The primary change in reservoir operations occurred in conjunction with the construction and subsequent operation of the Pumping-Generating Plant, which can deliver water

to and from Banks Lake via the Feeder Canal. Two pump generators were installed in 1974, three in 1983, and one in 1984. Daily fluctuations in lake levels can range from 1.5 to 3 feet during power generation periods.

Weed control drawdowns have also been implemented in recent years. This control strategy typically draws and holds the lake level down about 20 to 25 feet during the winter ice season. This practice occurs on a 7 to 10 year facility maintenance cycle and is designed to eliminate the noxious weeds common to reservoir shoreline areas, particularly Eurasian watermilfoil.

Surface Water Quality

Updated in November 1997, the surface water quality standards for Washington State are detailed and described in Chapter 173-201A of Washington's Administrative Code (WAC). The purpose of Chapter 173-201A is to "establish water quality standards for surface waters consistent with public health and public enjoyment thereof, and the propagation and protection of fish, shellfish, and wildlife" (WAC 173-201A-010). In conformance with present and potential uses of the state's surface waters and in consideration of natural water quality limitations and potential, beneficial use designations and applicable water quality criteria are established.

Washington State has classified its waters according to their beneficial uses and has established water quality criteria for each classification. Washington's surface water classifications are Class AA (extraordinary), Class A (excellent), Class B (good), Class C (fair), and Lake class. Surface water bodies are assigned classifications based on how closely they can be expected to meet the classification requirements for the water's intended uses. Compliance with Washington's surface water quality standards requires compliance with the water quality standards (Chapter 173-201A) and the sediment management standards (Chapter 173-204). The water quality criteria are shown either numerically or in the form of a narrative statement.

The water quality standards and beneficial use criteria applicable to Banks Lake are defined under the "Lake class" designation. Lakes are distinguished from riverine systems as being water bodies, including reservoirs, with a mean detention time greater than 15 days.

Lake class waters are expected to meet or exceed the requirements for water supply (domestic, industrial, agricultural), stock watering, fish and shellfish (salmon and fish migration, rearing, spawning and harvesting; and clam, mussel and crayfish rearing, spawning, and harvesting), wildlife habitat, recreation (primary contact recreation, sport fishing, boating, and aesthetic enjoyment), and commerce and navigation.

Ground Water Hydrology

Ground water movement in the regional aquifer system is affected by the distribution of natural recharge and discharge, the geology of the basalts, the spatial distribution of hydraulic conductivity, recharge from water management practices, and prolonged irrigation pumping. The dominant pattern of ground water movement is from areas of higher land surface elevations toward major surface drainage features such as Banks Lake and Crab Creek; away from anticlinal

axes; and in the direction of the regional geologic dip. Ground water movement between formations is generally downward with upward flow from or within the Grande Ronde Basalt in the vicinity of the Columbia River, Crab Creek, and other major surface water bodies (USGS, 1989).

A thick sequence of Columbia River basalts of Miocene age forms the Columbia Plateau regional aquifer system found in eastern and central Washington, eastern Oregon, and a small part of Idaho. Extruded primarily from a system of northwest linear vents in northeast Oregon and southeast Washington, the basaltic lava eruptions occurred approximately 6 to 17 million years ago; while later lava eruptions flowed generally westward into a structural and topographic basin.

The basalts are essentially horizontal with minor amounts of interbedded Miocene sediments of various lithologies. Interbeds tend to be thicker and occur more commonly in successively younger basalt formations, largely reflecting the time interval over which the formations were placed and the magnitudes and extent of uplifts in and around the plateau (USGS, 1989). Individual basalt flows range in thickness from a few inches to more than 300 feet and generally average about 100 feet. The average total thickness of the Columbia River Basalt complex is about 2,500 feet.

The Yakima Basalt Subgroup of the Columbia River basalts includes the Wanapum and Grande Ronde Basalts, the geologic formations of primary interest in the RMP management area. The Grande Ronde Basalt, which makes up about 85 percent of the total basalt volume in the Columbia Plateau, is the lowermost formation in the subgroup and underlies most of the Banks Lake management area. This basalt is composed of as many as 130 individual lava flows, most of which are fine-grained.

A sedimentary interbed between the Grande Ronde Basalt and the overlying Wanapum Basalt occurs east of the Grand Coulee formation where Banks Lake is situated. Where present, the interbed averages about 25 feet in thickness and consists chiefly of claystone and siltstone (USGS, 1994). Above this interbed, the Wanapum Basalt generally contains about 33 individual flows, most of which are medium-grained.

The Columbia Plateau regional aquifer system is comprised of four aquifer units and three confining units. Within the Banks Lake management area, two aquifer units and two confining units are present. In descending order these units are the Wanapum unit, the Wanapum-Grande Ronde interbed (a confining unit), the Grande Ronde unit, and the Basement confining unit. Composed of rock materials older than the Grande Ronde basalts, the pre-basalt "basement" rocks (the Basement confining unit) define the base of the regional aquifer system.

The Wanapum aquifer unit averages about 400 feet in thickness just east of the Banks Lake management area but varies from a few feet where it pinches out against exposures of the Grande Ronde Basalt to more than 1,200 feet in the Horse Heaven Hills located south of the management area. Within the deeply incised upper Grand Coulee, where Banks Lake is situated, the thickness of the Grande Ronde unit averages about 1,000 feet and varies from a few feet where it pinches out against "basement" granitic rocks near Grand Coulee Dam to greater than 1,500 feet near the southern end of the management area. Where the Grande Ronde unit pinches out against the

Basement confining unit in the upper northernmost portion of the management area, the regional aquifer is essentially absent or very thin.

Water entering the basalts flows horizontally and vertically through vesicles, joints, fractures, and the intraflow structures that create permeable zones. High permeabilities and horizontal ground water movement generally occurs in the interflow zones which consist of the rubbly and vesicular bases and tops of adjacent lava flows. The more dense, central portion of each lava flow typically have low permeabilities and vertical water movement characteristics (USGS, 1989). In addition, shearing and fracturing the basalt flows can create local areas with large permeabilities in joints and fractures. Displacement of individual flows along faults locally can provide fractured zones across basalt flows that can serve as conduits for vertical ground water flow (USGS, 1994).

Within the Banks Lake management area, horizontal ground water movement for the Wanapum unit is south/southwesterly towards Banks Lake and Crab Creek for the Grande Ronde unit. In addition, the movement of ground water is downward from or within the Wanapum unit and upward from or within the Grande Ronde unit in the vicinity of Banks Lake since this is a topographically low discharge area.

Ground Water Quality

Updated in October 1990, the ground water quality standards for the State of Washington are detailed and described in the Washington's Administrative Code (WAC) Chapter 173-200. The purpose of Chapter 173-200 is to "establish ground water quality standards which, together with the state's technology-based treatment requirements, provide for the protection of the environment and human health, and protection of existing and future beneficial uses of ground waters" (WAC 173-200-010). The requirements and water quality standards outlined in Chapter 173-200 apply at all times to all ground waters.

The goal of the standards is to maintain high ground water quality and to protect existing and future beneficial uses through the reduction or elimination of contaminants discharged to the subsurface. The goal is achieved through three mechanisms:

- AKART (all known, available and reasonable methods of prevention, control, and treatment) - All wastes must be provided with AKART prior to entry into the state's waters, regardless of water quality.
- The anti-degradation policy which mandates protection of background water quality.
- The human health and welfare based standards which include numeric and narrative standards (see WDOE Publication No. 96-02, April 1996).

Washington ground waters are not classified, but are protected for all beneficial uses including domestic, stock watering, industrial, commercial, agricultural, irrigation, mining, fish and wildlife maintenance and enhancement, recreation, electric power generation, preservation of environmental and aesthetic values, and other uses (WAC 173-200-010). This protection requirement is reinforced by the state's ground water anti-degradation policy which provides that

existing and future beneficial uses be maintained and protected, and that degradation of ground water quality that would interfere with or become injurious to beneficial uses not be allowed (WAC 173-200-030). The policy also provides that whenever ground waters are of a higher quality than the criteria assigned for said waters, existing quality will be protected.

The primary control factor of ground water chemistry and quality in the basaltic aquifer units underlying the Banks Lake area is the reaction of water with the rocks that make up the units. As the rock materials dissolve, the chemical characteristics of the ground waters change, and the waters can be described by the relative amounts of specific dissolved materials.

In 1987, the United States Geological Service (USGS) released a report describing the water quality characteristics of the basalt units of the Columbia Plateau aquifer system. The report was based on data collected from 350 wells and 825 water samples taken during the 1982 to 1985 period. Generally, the report concluded that ground water quality in the basaltic units is of good quality and suitable for most beneficial uses.

2.2.7 Vegetation

Communities

Native plant communities within the management area include a variety of arid and semi-arid shrub-steppe and mesic shrub habitats as well as scattered wetlands, riparian areas, and mature conifer/forest habitats. Grasslands are uncommon and are usually in the early successional phase of shrub-steppe. Shrub-steppe and mesic shrub communities dominate upland areas and the base of talus slopes and coulee walls. Shrub-steppe, riparian and mature conifer/forest communities dominate the ravines, rock outcrops and coulee walls found in the vicinity of Northrup Canyon and Osborn Bay. Riparian and wetland communities occur in association with perennial streams (e.g. Northrup Creek), coulee springs and seeps (e.g. Bebe Springs), in low-lying areas periodically flooded, and along the reservoir shoreline. Non-native (exotic) plant species are present in agricultural, residential and recreational areas.

Shrubs common to the management area include: big sagebrush *(Artemisia tridentata*), threetip sagebrush (*Artemisia tripartita*), stiff sagebrush (*Artemisia rigida*), rabbitbrush (*Chrysothamnus* spp.), bitterbrush (*Purshia tridentata*). Mesic shrub habitat, found at the base of talus slopes and in areas with run offs and seeps, include: common chokecherry (*Prunus virgianianus*), snowberry (*Symphoricarpos albus*), mockorange (*Philadelphus lewisii*), currant (*Ribes* spp.), rose (*Rosa* spp.), blue elderberry (*Sambucus cerulea*), and serviceberry (*Amelanchier alnifolia*) (Franklin and Dryness, 1973. Common forbs (herbaceous perennials) include: lupine, buttercup, buckwheat (*Eriogonum* spp.), poison ivy, prickly lettuce (*Lactuca serriola*), yellow salsify (*Tragopogon dubius*), yarrow, goldenrod, mullein, thistle, silverweed (*Potentilla anserina*), and cinquefoil.

Shrub-steppe plant communities are the climax upland habitat association present over most of the management area. Three types of shrub-steppe were identified, possibly dependent on soil depth and salinity. Overall, big sagebrush communities occur on deeper soils and are the predominant shrub-steppe association present. Dominant grasses and forbs occurring in this association include: bluebunch wheatgrass *(Agropyron spicatum)*, needle-and-thread grass (*Stipa*

comata), quack grass (*Agropyron repens*), Basin wildrye (*Elymus cinereus*), bluegrass (*Poa* spp.), arrowleaf balsamroot (*Balsamorhiza sagittata*) and buckwheat (*Eriogonum spp.*). Also common are exotic species such as cheatgrass (*Bromus tectorum*) and Japanese brome (*Bromus japonicus*) (FWS, 1998). Many areas identified as grassland often more closely resembled weedy fields with several weedy forbs such as hoary cress (*Cardaria draba*), knapweed (*Centaurea* spp.), sweetclover (*Melilotus* spp.) and thistle (*Cirsium* spp.). These weedy grasslands primarily occur in transition areas from wetland/riparian to upland areas (FWS, 1998).

Stiff sagebrush is the dominant shrub on shallow and rocky soils. Grasses such as Sandberg's bluegrass and cheatgrass occur with forbs such as common yarrow (*Achillea millefolium*) and lupine (*Lupinus* spp.). Shrub-steppe communities on saline soils are dominated by greasewood (*Sarcobatus vermiculatus*), four-wing saltbush (*Atriplex canescens*), and inland saltgrass (*Distichlis stricta*) (FWS, 1998).

The Wyoming big sagebrush/bluebunch wheatgrass association is the most widespread. This association consists of four well-defined vegetative layers. The most prominent layer consists of various shrub species (principally big sagebrush) intermixed with a second layer comprised of a variety of perennial grasses (principally bluebunch wheatgrass). The third layer consists of low-lying perennial and annual grasses and forbs which are usually less than four inches in height (e.g. Sandberg's bluegrass, cheatgrass, and Idaho fescue). The fourth layer is made up of a thin, fragile microbiotic crust, also called a cryptogram, which occurs directly on the surface of the soil. Various crustose lichens, acrocarpus mosses, and liverwort species comprise this layer which has important influences on vegetation dynamics with regards to soil erosion, moisture retention, and nutrient cycling. A complete list of the plant species observed by the FWS is provided in Appendix B.

Noxious Weeds

Noxious weeds are a common problem in the management area and generally invade and occupy sites that have been previously disturbed by fire, livestock grazing, motorized travel, and/or dispersed camping. In Washington, a weed is any plant species that is not native to the state. Weeds typically interfere with the maintenance of healthy and diverse ecosystems. Consequently, weed control is an integral part of resource management as non-natives can displace native plant species and are often of lower forage value to wildlife and difficult to extirpate once established. Other wildlife requisites, such as cover and nesting habitat, are also affected by the replacement of native plants by weedy species (see Appendix A).

Cheatgrass (*Bromus tectorum*), the most common weed found in the management area, has invaded many areas where native perennials have been overused and/or eliminated. There is little evidence that cheatgrass will relinquish a site once occupied due to its highly competitive ability. Other common noxious weeds include diffuse and spotted knapweed (*Centaurea diffusa* and *biebersteinii*, respectively), Canada thistle (*Cirsium arvense*), pepperweed (*Lepidium latifolium*), kochia (*Kochia scoparia)*, Dalmation toadflax (*Linaria dalmatica spp. dalmatica*), Russian knapweed (*Acroptilon repens*) and purple loosestrife (*Lythrum salicaria*). Cheatgrass, knapweeds, and Canada thistle currently are the most prolific weeds present at Banks Lake.

The proliferation of these undesirable plants is controlled through the implementation of an integrated weed management program between Reclamation, Washington State, and the Noxious Weed Control Boards of Douglas and Grant counties. At Banks Lake, the WDFW is responsible for weed control. The main weed control activity currently is helicopter spraying of 2,4-D on Canada thistle.

Eurasian watermilfoil (*Myriophyllum spicatum*) is a rooted, submersed aquatic macrophyte of the plant family Haloragaceae native to Europe, Africa, and Asia. An aquatic weed first found in Banks Lake in 1977, it has no natural enemies in North America and often out competes native plants, forming dense mats which may cause problems in swimming, boating, fishing, navigation, and power generation. When detached and transported by waves or currents to shorelines, it decays and causes appearance and odor problems. Existing infestations are source points for infestation of other waters in eastern Washington (Bureau of Reclamation, 1989).

2.2.8 Fish

Many of the fish species present in Banks Lake were pumped in from FDR Lake on the Columbia River. The remainder of fish species originated in small lakes (that existed in the upper Grand Coulee) prior to inundation of Banks Lake and from the stocking programs carried out by state agencies. Unfortunately, no official records were made of the fish fauna previously found in these small lakes. Information from local fishermen indicated that before inundation, dense populations of largemouth bass (*Micropterus salmonides*) and pumpkinseed sunfish (*Lepomis gibbosus*) existed in the area (Thomas, 1978).

Shortly after inundation, a substantial population of largemouth bass developed as indicated by WDFW catch records from 1952 through 1954 (Nelson, 1954). Largemouth bass and sunfish dominated catches in these years and represented 64 and 32 percent of the catch, respectively (Nelson, 1954). Yellow perch (*Perca flavescens*), rainbow trout (*Oncorhynchus mykiss*), eastern brook trout (*Salvelinus fontinalis*), kokanee salmon (*Oncorhynchus nerka*), black crappie (*Pomoxis nigromaculatus*), burbot (*Lota lota*), and bull trout (*Salvelinus confluent*) were also identified in the 1952 to 1954 catches (Nelson, 1954 and Spence, 1965).

Irrigation water pumped from FDR Lake was the source of calkin salmon, burbot, bull trout, and possibly rainbow and eastern brook trout sampled in early 1950's creel surveys. Black crappie may have been an early illegal introduction (Duff, 1973). Only four bull trout were recorded in 1954 creel checks. With no available spawning habitat, bull trout never became established in the reservoir. Eastern brook trout also failed to establish a reproducing population and both species of carr disappeared from catch and gill net survey data.

A gill net and beach seine survey conducted in Banks Lake between 1973 and 1975, found the following additional species for which there are no records of introduction: peamouth chub (*Mylochelius caurinus*), northern pikeminnow (*Ptychochelius oregonensis*), carp (*Cyprinus carpio*), longnose sucker *(Catostomus catostomus*), largescale sucker (*Catostomus macrochirus*), bridgelip sucker (*Catostomus columbianus*), brown trout (*Salmo trutta*), mountain whitefish (*Prosopium williamsoni*), lake whitefish (*Coregonus clupeaformis*), brown bullhead (*Ictalurus nebulosis*), walleye (*Stizostedion vitreum*), bluegill sunfish (*Lepomis macrochirus*) and prickly sculpin (*Cottus asper*). Only one brown trout was sampled and suitable spawning habitat for the

species does not exist in the system. With the exception of carr, brown trout and rainbow trout, all of the other fish present in pre-reservoir lakes or drafted from FDR Lake were able to establish reproducing populations to various degrees. Table 2.2 summarizes the past and present fish species found in Banks Lake.

Table 2.2
Past and Present Fish Species [1] Found in Banks Lake, Washington

Common Name	Scientific Name	Present	WDFW Priority Species	Past
Game Fish				
Salmonids				
Rainbow Trout	*Oncorhynchus mykiss*	X	X	
Eastern Brook Trout	*Salvelinus fontinalis*			X
Brown Trout	*Salmo trutta*			X
Coho Salmon	*Oncorhynchus kisutch*			X
Chinook Salmon	*Oncorhynchus tschawytscha*			X
Calkin Salmon	*Oncorhynchus nerka*	X	X	
Bull Trout	*Salvelinus confluent*			X
Mountain Whitefish	*Prosopium williamsoni*	X		
Lake Whitefish	*Coregonus clupeaformis*	X		
Catfish				
Brown Bullhead	*Ictalurus nebulosis*	X		
Yellow Bullhead	*Ictalurus natalis*	X		
White Catfish	*Ictalurus catus*	X		
Channel Catfish	*Ictalurus punctatus*	X	X	
Sunfish				
Largemouth Bass	*Micropterus salmoides*	X	X	
Smallmouth Bass	*Micropterus dolomieui*	X	X	
Black Crappie	*Pomoxis nigromaculatus*	X		
Bluegill Sunfish	*Lepomis macrochirus*	X		
Pumpkinseed Sunfish	*Lepomis gibbosus*	X		
Perch				
Yellow Perch	*Perca flavescens*	X		
Walleye	*Stizostedion vitreum*	X	X	
Cods				
Burbot	*Lota lota*			X
Nongame Fish				
Lampreys				
Pacific lamprey	Lampetra tridentata	unconfirmed		
Minnows				
Peamouth Chub	*Mylochelius caurinus*	X		
Northern Pikeminnow	*Ptychochelius oregonensis*	X		
Carp	*Cyprinus carpio*	X		
Suckers				
Longnose Sucker	*Catostomus catostomus*	X		
Largescale Sucker	*Catostomus macrochirus*	X		

Table 2.2
Past and Present Fish Species [1] Found in Banks Lake, Washington

Common Name	Scientific Name	Present	WDFW Priority Species	Past
Bridgelip Sucker	*Catostomus columbianus*	X		
Sculpins				
Prickly Sculpin	*Cottus asper*	X		

Sources: Duff 1973, Foster 1998, Korth 1998, Nelson 1954 , Spence 1965, Thomas 1978, and WDFW 1996

[1] Common and scientific names of fish are based on: Robins, C.R., Chairman, 1991*; A List of Common and Scientific Names of Fish from the United States and Canada*, 5th edition: American Fisheries Society (Committee on Names of Fish) Special Publication 20, Bethesda, Maryland.

2.2.9 Wildlife

This section provides a general overview of the wildlife species found at Banks Lake. The "Special Status Species" are identified here in bold type. Wildlife and raptor concentrations and occurrences at Banks Lake were identified by the FWS and WDFW.

Birds

A total of 150 species of birds were observed within the RMP management area during field surveys conducted by the FWS in 1997 and 1998. Only two additional species have been confirmed in Smith et al. (1997) and WDFW's Wildlife Heritage database. Breeding evidence was observed for 55 species, with a breeding record for one additional species, Clark's grebe *(Aechniophorolis clarkii)* (Smith et al. 1997).

Raptors

Eleven raptor species were observed during eight raptor surveys conducted from December 23, 1997, to April 11, 1998. Two species which were expected to occur during these surveys, but not observed, include short-eared owl *(Asio flammeus)* and Cooper's hawk *(Accipiter cooperii)*. Nocturnal species such as barn owl *(Tyto alba)* and western screech owl *(Otus asio)* are likely present, but were not observed during the daylight surveys.

Colonial-nesting Birds

Three islands at the southern end of Banks Lake have been used for nesting by colonial-nesting birds for several years. On June 26, 1998, the islands were surveyed to estimate colonial-nesting bird population numbers. The southernmost island, Gull Island, is located about 0.4 km (0.25 mi) north of Dry Falls Dam. This island had **great blue heron** and **black-crowned night-herons** were observed nesting in small trees and shrubs on the island. There were about 20 juvenile

great blue herons and 40 juvenile black-crowned night herons present. Approximately 1,500 California gulls *(Larus californicus),* adults and chicks, were also observed. The other two islands are about 2 miles north of the dam and separated by about 50 yards of open water. Numbers of adults and chicks present on these islands included approximately 1,000 California gulls, 3,000 ring-billed gulls, and 50 **caspian terns**.

Waterfowl

Twenty-two waterfowl species were observed by the FWS. Breeding was confirmed for ten species, including **Canada geese**, green-winged teal *(Anas crecca),* mallard *(Anas platyrhynchos),* blue-winged teal *(Anas discors),* northern shoveler (*Anas clypeata*), cinnamon teal *(Anas cyanoptera),* gadwall (*Anas strepera*), redhead (*Aythya americana*), lesser scaup (*Aythya affinis*), and ruddy duck (*Oxyura jamaicensis*). Primary waterfowl use during the breeding season occurred below
Dry Falls Dam, in Devil's Punch Bowl, and in Osborn Bay. More scattered use was in the smaller bays and inlets on the main lake and other wetlands.

During the beginning of fall migration, several thousand mallards and northern pentails *(Anas acuta)* and several hundred Canada geese used the shoreline at the southeast end of Banks Lake. Waterfowl use was heaviest and contained the highest diversity of species throughout the field season in the various wetlands, ponds and lakes south of Dry Falls Dam.

Aerial winter counts have been conducted at Banks Lake by FWS and WDFW for many years. Since 1990, the average winter count was 4,600 ducks, geese, and swans. The highest count was nearly 20,000 birds and the lowest count was zero birds when the reservoir was 100 percent ice-covered.

Shorebirds

Two surveys targeting fall migrating shorebirds revealed very low numbers. However, most of the expected species were observed (14 total). The majority of these were found at the wetlands and lake fringes below Dry Falls Dam. In other portions of the management area, shorebird use consisted almost exclusively of killdeer *(Charadrius vociferous)* and spotted sandpipers *(Actitis macularia).* The low numbers and diversity of shorebirds in the majority of the management area is probably due to limited mud, silt or sand substrates and relatively constant water levels.

Neotropical Migratory Birds (NTMB)

Sixty-six species listed as neotropical migratory birds were observed during the FWS survey or otherwise documented within the management area. Neotropical migratory birds (NTMB) are species which breed in the United States and Canada and then migrate south to Mexico, Central or South America, or the Caribbean for the winter. They do not include waterfowl, shorebirds, or herons and egrets even though some species in these groups also winter south of the Mexico-United States border. There is widespread concern about the future of NTMBs (Andelman and

Stock, 1994), because many of these species have experienced large population declines due to habitat destruction of breeding grounds, wintering areas, and along migration routes.

Mammals

Forty-seven mammals were identified to occur or potentially occur within the management area(see Appendix D). Unlike the individual species of birds and raptors discussed in the overview, most wildlife species, thought to be found in the management area, are considered common and are not listed as "Special Status Species." Consequently, the section addressing mammals is substantially shorter than the previously mentioned avian section. FWS personnel observed 16 species either directly or by sign during field work. Thirty-four species were documented as present within the management area. **Mule deer** regularly use the management area. Black bear *(Ursus americanus)* and cougar *(Felis concolor)* have been sighted, but were probably transients. However, a black bear road-kill was documented by the Washington Department of Game near Steamboat Rock in May, 1984 (FWS, 1998).

Muskrats *(Ondatra zibethicus)* and mink *(Mustela vison)* were commonly observed on the lake. Coyotes *(Canus latrans)* appeared to be common and were either sighted, heard, or observed by sign throughout the management area. Badgers *(Taxidea taxies)* are fairly secretive and were not observed directly but their diggings and tracks were found.

In June 1998, the FWS observed what was either a pygmy rabbit or a young Nuttall's cottontail *(Sylvilagus nuttallii)* near Osborn Bay. Further examination of the immediate area by FWS and WDFW biologists revealed burrows and scats that resembled that of pygmy rabbits. These findings prompted pygmy rabbit surveys. Follow-up surveys in September 1998, revealed more pygmy rabbit or young cottontail scat. The site was relatively small (4 to 6 hectares or 10 to 15 acres) and dominated by very large bitterbrush and big sagebrush with loose soils. Similar scat was also collected in the shrub-steppe south of Steamboat Rock; however, no burrows were located. No potential pygmy rabbit sign was found on the Million Dollar Mile shrub-steppe flat west of SR 155.

Some documented species found specifically, but not necessarily exclusively, in shrub-steppe habitat include: furbearers such as coyote, badger, and bobcat *(Lynx rufus);* small mammals such as sagebrush vole *(Lemmiscus curtatus),* northern pocket gopher *(Thomomys talpoides),* and deer mouse *(Peromyscus maniculatus);* and other mammals such as mule deer, Nuttall's cottontail, and porcupine *(Erethizon dorsatum).*

Amphibians and Reptiles

Eleven species of amphibians and reptiles were documented within the management area, with seven of those found during 1998 surveys (see Appendix E). The Racer *(Coluber constrictor)* was the most common reptile encountered, with western rattlesnake *(Crotalus viridis)* the next most common species. Unidentified tadpoles were observed in a Northrup Canyon wetland. Surveying suitable habitat in the spring when frogs are calling, would likely have resulted in more amphibian species observed. The only documented record of the Columbia spotted frog *(Rana luteiventris)* is a historic sighting from 1937. The spotted frog, a Federal "Species of

Concern" and State candidate species, was collected east of Steamboat Rock at a stream which flows into Devil's Punch Bowl.

2.3 CULTURAL RESOURCES SUMMARY

2.3.1 History

Unlike many regions of North America, the cultural history of the Columbia Plateau has not been adequately documented. A general cultural sequence was developed, for the Banks Lake management area, based upon major changes; most of these changes were present in the previously identified chronologies for the area. This sequence has been divided into unnamed time periods based upon changes in projectile points styles. The use of projectile point types to develop chronological sequences is commonly practiced within the North American west (e.g. Baumhoff, 1959; Heizer, 1978; and O'Connell, 1967) where major architectural features and well developed pottery are generally absent. The principal sources for this sequence are Browman, 1960; Daugherty, 1962; Dumond, 1983; Leonhardy, 1970; Nelson, 1969; Rice, 1972; Salo, 1985; Stevens, 1997; Swanson, 1962; Toepel, 1980; and Warren, 1968.

The earliest period dates from 8000 B.C. to 6000 B.C. and is represented by large, lanceolate "Windust" projectile points. Other associated artifacts of this period include edge-ground cobbles, isolated fluted points and crescents, and occasional millingstones and handstones. This evidence suggests a nomadic hunting economy relying on the seasonal take of large game. Supplemental food resources could have included fish, small game, plants, and shellfish.

During the next period (6000 B.C. - 4000 B.C.) the same general economic focus is employed by the aboriginal inhabitants of the Columbia Plateau. The hunting of game, however, appears to be decreasing in importance with a subsequent increase in the utilization of riverine resources. The "Windust" points have been replaced by large, leaf-shaped "Cascade" projectile points. Other artifacts occurring during this period include edge-ground cobbles, oval knives, large scrapers, millingstones and handstones, and various antler and bone tools.

In the period between 4000 B.C. and 1500 B.C. the economic focus is more diversified than in the two previous periods. The gathering of both plant and shellfish resources dominate the seasonal activities like hunting and fishing. Large, side-notched projectile points of the "Northern", "Bitteroot," and "Cold Springs" series are the period markers. Other artifacts of this period include both millingstones and mortars with their associated counterparts, handstones and pestles, respectively.

The fourth period (1500 B.C. to A.D. 250) is a period of transformation for the inhabitants of the Columbia Plateau. Cultural influences from Canadian Plateau groups are making inroads into the region. A riverine economy based upon the utilization of anadromous fish is developing. Hunting and gathering still continue but at a much decreased level. A much greater inventory of artifacts occur at sites associated with this period including contracting or tanged-stemmed "Frenchman Springs" or "Rabbit Island" projectile points, microblades, notched net sinkers, hopper mortars, pestles, antler and bone wedges, stone celts and mauls, and bone hunting and fishing implements.

By the fifth period (A.D. 250 to A.D. 1730) the riverine based economy predominates. Large, semi-permanent villages occur along the Columbia's floodplains and at the mouths of it's major tributaries, but small, seasonal camps still exist and are located close to natural resources. A variety of small projectile points occur at this time including a tool kit containing tailed end scrapers, notched net sinkers, mauls, block and slab millingstones, shell beads, and bone harpoon heads.

The period from A.D. 1730 to A.D. 1810 is marked by the presence Euro-American manufactured items including glass and copper beads, guns, and various iron implements. The general pattern of reliance upon riverine resources continues; however, cultural influences from Plains groups appear. With the introduction of the horse, excursions to the Plains are made by mounted hunters in search of buffalo. The larger sedentary villages become trade centers in a regional exchange system, also made in part possible by the introduction of the horse. Artifacts of aboriginal origin include a variety of small projectile points, and notched and perforated net sinkers.

During the ethnohistoric period (A.D. 1770 - A.D. 1860), a general breakdown of pre-contact aboriginal lifeways occurs due to repeated interaction with Euro-Americans. While fishing remains the primary subsistence activity, hunting and gathering grow in importance, resulting in a return to a more generalized subsistence base. The artifact inventory resembles that of the previous period, but the presence of Euro-American trade goods continues to increase.

The final, reservation period (A.D. 1860 - present) represents the era in which aboriginal groups were coerced into adopting Euro-American lifeways (e.g. farming, ranching) resulting in the reduction or replacement of aboriginal subsistence practices. The period is marked by the nearly complete abandonment of aboriginal tools and subsequent adoption of Euro-American trade and consumer goods.

2.3.2 Traditional Cultural Properties

Reclamation contracted with AHS and Camas Consulting to prepare an inventory of Traditional Cultural Properties (TCPs) in consultation with representatives of the CCT. Out of respect to the wishes of the CCT, the information on TCPs submitted to Reclamation is considered confidential. Several of the archaeological properties have been designated by the CCT as TCPs. Eighteen sites have been so designated - twelve are within the management area and six are adjacent to the management area. The twelve sites include one housepit site, four pictograph sites, one talus pit, two habitation or camp sites, one lithic scatter, and three inundated sites. The six sites outside the management area include one rockshelter, one housepit, three habitation or campsites, and one lithic scatter. Additional information on TCPs is on file with Reclamation (Moura, 1997).

2.3.3 Indian Trust Assets

The United States government has a trust responsibility to protect and maintain rights reserved by or granted to American Indian tribes or individuals by treaties, statutes, and executive orders. Indian Trust Asset (ITA) identification involves consultation with potentially affected tribes,

Indian organizations or individuals, the Bureau of Indian Affairs, the Office of American Indian Trust, the Solicitor's Office, Reclamation's Native American Affairs Office, or the Regional Native American Affairs Coordinator. Under the Bureau of Reclamation's Indian Trust Asset Policy of 1993, the agency consults directly with tribes potentially affected by Reclamation undertakings to identify and analyze potential impacts to any assets. This consultation is documented in a NEPA compliance document, along with a statement of potential impacts to ITAs. This policy is designed to ensure that Reclamation complies with the Department of the Interior's Manual 512.2, Departmental Responsibilities for Indian Trust Assets, which identifies responsible parties and outlines consultation procedures.

Tribes holding ITAs in the Banks Lake area include the Yakima, Colville, Spokane, and Coeur d'Alene. In the Banks Lake area, water, wildlife and fish, as well as food and medicinal plants are protected as ITA, as are some religious sites and Traditional Cultural Properties. During the course of preparing the Banks Lake RMP, any activities which might affect these assets requires Reclamation to consult with the tribes, the Bureau of Indian Affairs, and other appropriate agencies to identify potentially affected ITAs, determine potential impacts to these assets, and provide recommendations for appropriate mitigation.

2.4 PALEONTOLOGICAL RESOURCE SUMMARY

The Columbia Basin basalts in the vicinity of Banks Lake do not lend themselves to fossil preservation. Some invertebrates are occasionally reported in the area, but not with any frequency. Preserved plant species are present elsewhere in the Basin. One such site is Gingko Petrified Forest State Park. The park is located in Kittitas County near where I-90 crosses the Columbia River at Vantage, Washington, approximately 30 miles west of Potholes Reservoir.

2.5 AESTHETIC RESOURCE SUMMARY

2.5.1 Visual

The Banks Lake area has spectacular scenery, which is characterized primarily by the basalt cliffs, headwalls, and talus slopes of the upper Grand Coulee which encompasses most of the management area. The landscape is further enhanced by a vegetative mosaic of shrub-steppe, mesic shrub, upland forest, and riparian/wetland plant communities. There are scenic views and vistas from recreation areas along the lake shore and from SR 155 along the eastern shoreline. The basalt landforms, such as Steamboat Rock and Castle Rock, are dominant features and focal points for most views in the northern half of the reservoir area. According to the Banks Lake Recreation User Survey, which was performed for the EA, scenic quality is one of the attributes that attract visitors to the Banks Lake area.

As seen from the reservoir or the numerous recreation sites and areas along the shoreline, the landscape is largely undeveloped and is appears natural in most areas. The dominant visual elements over most of the management area are natural features such as water, basalt cliffs/coulee walls, granitic outcrops, and shrub-steppe plant communities. The majority of the

respondents to the Banks Lake Recreation User Survey (refer to EA) prefer a natural, undeveloped landscape.

While most of the landscape is undeveloped, there is also clear evidence of human activity. Visual intrusions/enhancements include urban/residential areas (Coulee City, Electric City, and Grand Coulee); developed recreation areas; dispersed campsites; off-road vehicle use areas; highways, primary/secondary roads and jeep trails; an airport; gravel/material sites; electric transmission lines; residential subdivisions; croplands; and cultural sites. This combination of natural elements and cultural modifications provides a pleasing visual setting for most visitors.

2.5.2 Noise

Noise is a term which refers to unwanted sound. Sound levels are measured in decibels (dB), a logarithnmic scale based on the ratio of sound intensity to the intensity of barely audible sound at 1,000 cycles per second. Every 10 dB represents a tenfold increase in loudness. For example, a sound at 90 dB is 10 times louder than a 80 dB sound and 100 times louder than a 70 dB sound.

The range of frequencies to which humans respond is referred to as the "A" scale, and readings of loudness for this range are recorded as dB(A). Given a threshold of hearing at 0 dB(A), the decibel reading that would be recorded on a very still, quiet evening at a lake is approximately 40 dB(A). Background levels on a beach or other busy area tend to range from 50 to 60 dB(A) (Wagner, 1994). Sound levels in excess of 75 dB(A) become annoying to many people and are termed "noisy." Constant exposure to sounds at 75 dB(A) or greater can cause damage to the human auditory system, but such constant exposure is uncommon under rural, recreational conditions (Lakeline, 1994).

The most sensitive noise receptors in the Banks Lake area are existing residential areas, campgrounds, and important wildlife areas. Ambient sound levels throughout most of the management area come from rural and residential land use. These ambient levels are affected by noise from vehicular traffic on nearby roads, powerboats and personal watercraft (jet skis) on the lake, overhead aircraft, and general recreational activities, all of which exert a greater influence during summer peak-use weekends. Noise from occasional snowmobile use increases ambient levels during the winter.

2.6 ECONOMIC AND SOCIAL RESOURCES SUMMARY

Banks Lake and its associated wildlife and recreational resources lie principally in Grant County, Washington. Isolated, small portions of the northwestern and southwestern shoreline and a portion of the southern tip of Banks Lake lie within Douglas County. Because Grant County residents are the principal population affected by the human use of resources at Banks Lake, the socioeconomic setting delineates Grant County as the primary management area. Portions of the eastern border of neighboring Douglas County adjoin the lake, but no existing uses there generate significant socioeconomic benefits. The public generally must come to Grant County to make use of the resources available at Banks Lake.

As elsewhere in the Columbia Basin, the management area is surrounded by farming country, with the wheat-growing industry dominating the local social and economic setting. Water-oriented recreation on Banks Lake and other lakes in the region, however, has become an important component of the local and regional economy.

2.6.1 Economic Setting

Agriculture-related activities dominate the economic setting. Statistical data on economic activities in the management area are not readily available at the sub-county level, so they must be inferred from county-wide data. The composition of employment and personal income are good descriptors of an area's economy--where people work and where their earnings come from. Data from the U.S. Department of Commerce's Bureau of Economic Analysis (BEA) indicates the regional economy and structure. Table 2.3 presents the numbers of jobs in the principal economic sectors of Grant County for 1996, paired with the corresponding value of personal income by sector.

Table 2.3
Employment and Income Data for Grant County, 1996

	Employment[1]		Personal Income[2]	
Sector	**Jobs**	**% distrib.**	**$ '000**	**% distrib.**
Totals	34,907	100.0%	1,243,116	100.0%
Wage and salary workers	28,071	80.4%	649,416	52.2%
Proprietors	6,836	19.6%	175,361	14.1%
Farming occupations	6,446	18.5%	172,873	13.9%
Nonfarming occupations	28,461	81.5%	651,904	52.4%
Agric. services, forestry, fishing	1,750	5.0%	23,919	1.9%
Mining	0	0.0%	91	0.0%
Construction	1,495	4.3%	43,734	3.5%
Manufacturing	4,301	12.3%	135,226	10.9%
Transport., comm., public utilities	1,239	3.5%	36,998	3.0%
Wholesale trade	1,484	4.3%	42,796	3.4%
Retail trade	5,461	15.6%	82,365	6.6%
Finance, insurance, real estate	0	0.0%	8,872	0.7%
Services	5,683	16.3%	94,040	7.6%
Government	5,829	16.7%	174,863	14.1%
Plus:				
Dividends, interest and rent	–		**226,991**	**18.3%**
Transfer payments	–		**265,160**	**21.3%**
Less:				
Pers. contrib. for social insurance	–		(47,853)	-3.8%

Source: BEA REIS, 1998.
[1] Employment in full and part-time jobs
[2] Personal income in thousands of 1996 dollars

The data show that about 2/3 (66.3 percent) of Grant county's personal income comes from workers' and proprietors' earnings, with the balance coming from transfer payments (mainly Social Security) and earnings on capital. Per capita income (of all residents) was $22,700 in 1996. Earnings per wage and salary worker in 1996 averaged $23,135, while proprietors

averaged $25,653. Non-labor income is relatively high, reflecting a larger than average number of residents in retirement. Nearly 20 percent of the jobs in Grant county are in farming, plus another 5 percent in agricultural services-related jobs (including forestry and fishing). Average earnings per farm-related worker amounted to $24,011. The government, services, retail trade and manufacturing sectors were the next largest in terms of jobs. Workers in manufacturing and government received somewhat higher earnings per job ($31,441 and $29,999, respectively), while those in services and retail trade had lower average annual earnings ($16,548 and $15,082, respectively) due to the latter sectors' typically low wage rates.

Public assistance programs benefit some of the residents in Grant County. In the fiscal year (FY) 1997, food stamps were provided to an average of 6,114 persons per month, which put Grant County as 22nd in the state in terms of percentage of county population covered. Aid for Dependent Children (AFDC) was provided to 3,906 cases (16th in statewide ranking) and disability payments went to 1,079 persons (also 16th place). The number of persons, in Grant County on general assistance was low, averaging 203 people per month. This average put the Grant County rating (in terms of a percentage of county population) at 25th in the state of Idaho (OFM, 1998).

Based on land use patterns and the level of tourism/visitation/recreation activities in the Banks Lake management area, it is evident the local economy is less diverse than the countywide pattern. Farming, services and government opportunities are the predominant employment sectors. Motel/hotel lodging services; fishing, hunting and recreational boating services; retail trade, government jobs related to local and tribal government and government enterprises; and hydropower activities account for most of the management area's non-farming income and employment. Other parts of the county have more manufacturing activities, notably food processing and chemical manufacturing in the Moses Lake area.

2.6.2 Recreation/Visitation

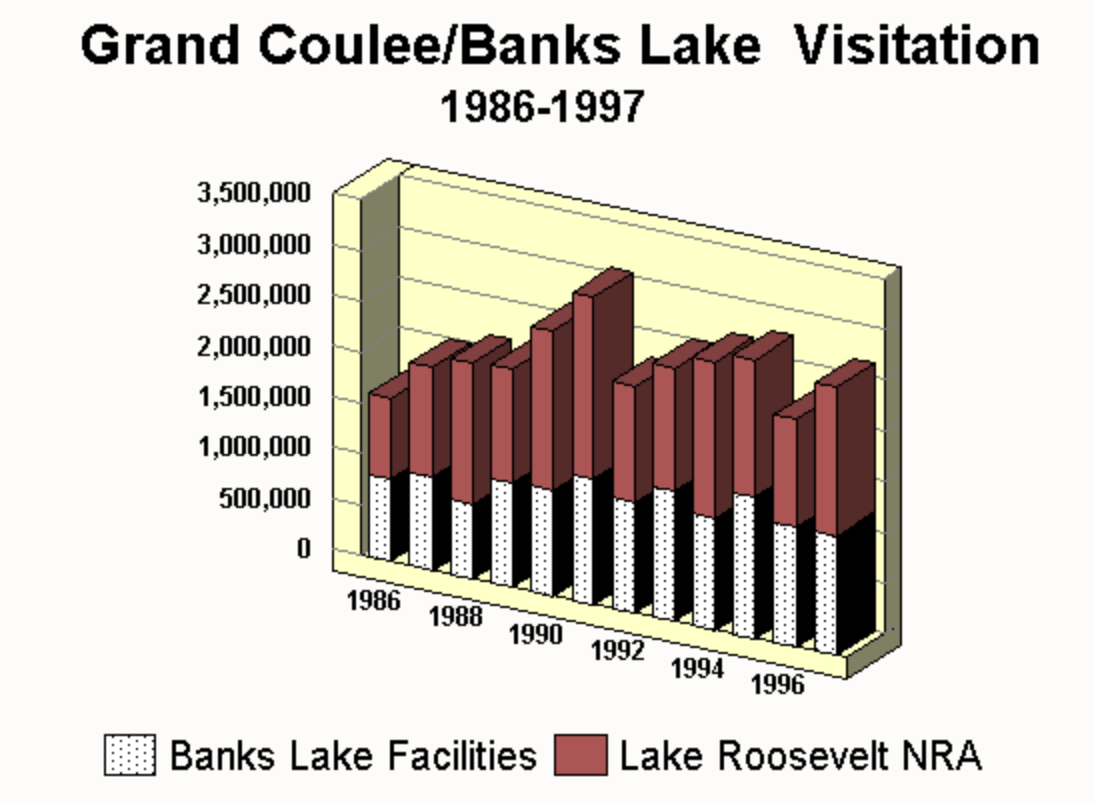
The Banks Lake area is an important tourist attraction. Steamboat Rock State Park has over 500,000 visitors annually. Other attractions in the vicinity of Banks Lake (apart from the Grand Coulee Dam Visitor Arrival Center and Lake Roosevelt National Recreation Area) log between 7,650 and 45,715 visits each year (see Table 2.4). Cumulatively, the area's attractions (including Grand Coulee Dam and FDR Lake) registered over 2.6 million visitors in FY 1997, about the same as in the preceding years in the decade.[1] Table 2.4 breaks down the 1997 total.

[1] The Grand Coulee Dam Area Chamber of Commerce (GCDACC) reported a total of nearly 1.5 million visitors to the Lake Roosevelt National Recreation Area and approximately one-half million visitors to the Grand Coulee Dam Visitor Arrival Center in fiscal year 1997.

Table 2.4
Visitation to Grand Coulee/Banks Lake Area, FY 1997

Facility	Visitors
Grand Coulee Dam Visitor Arrival Center	467,347
Lake Roosevelt-National Recreation Area	1,462,820
Steamboat Rock State Park	583,496
Crown Point Vista	45,715
Roosevelt Recreation Enterprises Houseboat Rentals	13,559
Coulee Playland Resort	20,000
Colville Tribal Museum	12,179
GCDA Chamber of Commerce	13,231
Coulee Dam Visitors Center	7,650
Dry Falls Interpretive Center	17,542
Total	**2,643,539**

Source: GCDACC, 1998.



The 1991, peak year had slightly more than 3 million cumulative visits to the region.[2]

The *Washington State 1991-1997p Travel Impacts and Visitor Volume* reported in 1996, travelers in Grant County spent $104.2 million for accommodations, transportation, campground fees, food and drink, and miscellaneous recreation and amusement activities (WDCT&ED, 1998). These expenditures supported nearly 2,000 direct jobs in various visitation and tourism businesses with a payroll of almost $20 million. This payroll supported additional secondary employment and income in the enterprises providing goods and services to the establishments and employees serving the visitors. Of the $104.2 million total, $8.97 million was spent for staying in public campgrounds, $18.13 million was spent for private campgrounds, and $33.31 million for motels, hotels, and Bed-and-Breakfasts. (WDCT&ED, 1998)

Some portion of this visitor spending went to Banks Lake area enterprises and attractions, but there are no data upon which to make a precise estimate of the split between Banks Lake area facilities and the rest of the county. However, the value is not insignificant in view of the extent of development of tourist-serving businesses and attractions in the area. The Grand Coulee Dam Area Chamber of Commerce lists six hotels and motels with a capacity for 170 guests; two bed-and-breakfasts (19 beds) and seven resorts/RV parks/campgrounds with a total of 650 sites; plus numerous parks and ample public utility services to serve visitors and residents (GCDACC, 1998). Steamboat Rock State Park generated nearly $350,000 in campsite and boat launching fees for the state during FY 1997 to 1998 (Burnett, 1998).

2.6.3 Local Services and Utilities

Highways

The Banks Lake area is served by several highways as well as local city and county roads. Running along the eastern shore between Grand Coulee and Electric City in the north and Coulee City at the south end of the lake, SR 155 is the principal thoroughfare serving the reservoir's eastern shoreline. Most of the land adjoining the western shoreline is privately owned and therefore not easily accessible to the public except by boat. This, coupled with the western shoreline's steep topography and basalt cliffs/coulee walls, restricts public vehicular access to essentially the Barker Canyon/Barker Flat and other northwestern reservoir areas.

Electric Power

Electric power has historically been abundant and relatively inexpensive in the management area. Electrical energy needs are provided by the Grant County Public Utility District (GCPUD), which owns and operates a system of substations, transmission and distribution lines, and associated general plant. Part of GCPUD's power comes from their Wanapum and Priest Rapids hydroelectric projects on the Columbia River, a portion from Grand Coulee Dam, and part from

[2] Visitation estimates based on traffic counters. The data for Steamboat Rock Park in 1996 are probably low due to some equipment failures during the year. (Kelton, 1998)

their 40-year contract interests in the 9.4 megawatt (MW) Quincy Chute Project and 6.5 MW Potholes East Canal Headworks Project. The electric system had gross operating revenues in 1995 of $62.2 million.

About 75 percent of the retail customers are residential, of whom more than ½ are rural customers. The District's rates are among the lowest in the nation averaging slightly more than 2.06 cents per kWh in April 1997. The average cost of electricity for residential service in 1997 was 2.86 cents/kWh, and the average annual bill for such service was $630 (Dames & Moore estimate based on GCPUD, 1998). Irrigation and industrial accounts consume the majority of supplied power. Major industrial users include food processing and chemical manufacturing establishments (GCPUD, 1998).

Water Supply and Wastewater Management

Potable water is obtained from wells drawing on a deep aquifer located within the basalt layers of the region. Wells are registered with the Washington State Department of Health. Grant County Health District personnel describe the area's ground water as being of overall good quality. Periodic well monitoring is perfomed to ensure that the state ground water quality standards are being met (Barry, 1998).

Residents of the towns of Grand Coulee, Electric City, and Coulee City are served by public water supply systems. The towns also provide sewage collection and treatment. Rural residents use individual wells and septic systems for their water supply and wastewater disposal requirements (Barry, 1998). SPRC provides potable water and restroom facilities (e.g. flush or vault toilets) at park campgrounds and day use areas (Kelton, 1998). The WDFW provides vault toilets at the developed boat launch and campground areas they administer.

Solid Waste Management

Solid wastes generated in the Banks Lake management area are generally disposed of in dumpsters situated in developed recreation areas and day use areas managed by the SPRC and WDFW. Under contract with franchised carriers, these solid wastes are collected and hauled to landfills in Grand Coulee and Ephrata, Washington (Barry, 1998).

Littering and trash dumping is not reportedly a problem in the Banks Lake region. At Banks Lake, however, recent inventories conducted by the FWS, WDFW, and Dames&Moore personnel (now URS Corporation) revealed the presence of trash dumps, litter, and garbage in or adjacent to many of the dispersed camping areas around the reservoir. Because the WDFW and SPRC do not have the personnel to adequately maintain these dispersed use areas, litter and trash problems often go undetected and local volunteers become responsible for remedying the situation (Kelton, 1998). Additional information on solid waste management is provided in the discussion on Public Industrial Refuse later in this chapter.

Fire Protection

Fire Protection in the Banks Lake area is provided by two of Grant County's fire districts - Electric City No. 14, which serves the northern end of the lake and Hartline No. 6, which serves the southern reservoir area. Volunteers comprise the staff, and the districts provide rescue and ambulance service. The districts are independent taxing jurisdictions levying property taxes for their funding (GCFD No. 14, 1998). The town of Coulee Dam has a fire insurance classification code of 5, while Electric City's is 6 (GCDACC, 1998).

Law Enforcement

Police protection is provided by various entities in the Banks Lake area. Municipal police departments in Grand Coulee (which also serves Electric City) and Coulee City serve their residents, while the Grant County Sheriff's Department has jurisdiction over unincorporated areas and lakes, using personnel residing in the Grand Coulee/Electric City and Coulee City areas (Shay, 1998). State Patrol personnel police the state highway system, state park personnel provide law enforcement on SPRC administered lands, and the WDFW have state fish and wildlife law enforcement authority. State Park and WDFW law enforcement officials in the Banks Lake area can call on the State Patrol and the Sheriff's Department for support. There are, however, no mutual aid agreements among these law enforcement agencies and Reclamation at this time (Kelton, 1998).

Grant County has a relatively low incidence of serious crime. In 1995, a total of 3,618 offenses were reported throughout the county, of which 1,085 (30 percent) were Part I offenses (violent and property crimes: murder, rape, robbery, assault, burglary, larceny, auto theft, and arson) while the remaining 1,533 were Part II offenses (forgery, fraud, embezzlement, vandalism, weapons violations, sex offenses, drug and alcohol abuse violations, gambling, vagrancy, curfew violations, and runaways). For purposes of comparison, the 1995, statewide rate for serious (Part I) offenses was 5,909 offenses per 100,000 inhabitants while Grant County's was 1,713 per 100,000 inhabitants (FBI, 1997). Comparable data for Part II offenses were not available, but it is evident from Grant County's experience with Part I crimes that the county is a comparatively safe place.

Health and Medical Services

Emergency medical services in the Banks Lake area are provided by the county fire districts in Electric City and Hartline. The Coulee Community Hospital (CCH) in Grand Coulee is the principal health care facility in the area. Providing general and acute care services, CCH has 48 licensed beds; 19 beds are for hospitalization ,and 29 beds are for long-term nursing care. The hospital employs approximately 100 staff, of whom seven are senior and mid-level physicians and health care professionals. A clinic in Coulee City provides medical services at the southern end of Banks Lake, while the next nearest general hospital is in Ephrata (Lang, 1998). Regional health care is provided in Wenatchee, Moses Lake, and Spokane.

Public Schools

The Banks Lake area is served by two public school districts, Grand Coulee Dam School District (SD) 301 and Coulee-Hartline SD 151. Eight other districts serve the rest of Grant County. Enrollment in FY 1996 to 1997 was 986 among the four schools comprising Grand Coulee Dam SD and 243 at Coulee-Hartline. Forty-five percent of the pupils in Grand Coulee Dam SD were classified as minority, including 413 Native Americans, six Asian or Pacific Islanders, five Blacks and 13 Hispanics, with the remaining 530 pupils White. In the Coulee-Hartline SD, the student body was almost totally White (248 of the 251 total enrollment) with one Native American and two Hispanics classified as minorities (OSPI, 1998).

Instructional staff in the Grand Coulee Dam SD numbered 49, yielding a pupil/teacher ratio of 19.6 to 1. The Coulee-Hartfield SD numbered 17 instructional staff, yielding a ratio of 14.8 pupils per teacher. At Grand Coulee, 39 percent of the pupils were receiving free or reduced cost lunches, and 11.3 percent were in Special Education. At Coulee-Hartline, the percentage receiving free or reduced cost lunches was 32, while 9.6 percent of the students were in Special Education (OSPI, 1998).

Fiscal Status

Changes in recreational resource use in the Banks Lake area could affect the income government agencies receive from payments for public services and taxes. It is not possible, however, to make a strict accounting of the sources and uses of funds by public sector agencies and entities in the management area, partly because of the lack of specific localized data, and partly because the various federal, state, county and local municipal agencies and jurisdictions have different geographical areas of responsibility. Thus, there is no basis for identifying whose fiscal activities pertain precisely to a given locale.

Under a 1953 MOA between the United States and Washington State, the state assumed management responsibility within the RMP management area. The SPRC receives revenues and leasehold taxes for the leases, licenses, permits, and concession contracts they administer at Banks Lake. These revenues, however, are trivial to the economy and averaged about $8,000 per year for the period between 1994 though 1997. Far more significant to the regional economy are direct visitor expenditures for locally-supplied goods and services plus the sales taxes generated by their sale.

At the local level, the municipalities of Grand Coulee, Electric City and Coulee City collect sales and property taxes and fees, and receive transfers from various state and federal programs to pay for their activities. The principal source of revenues relating to Banks Lake area visitation are sales taxes on the taxable retail purchases of visitors. These municipalities also impose a sales tax of 1.1 to 1.2 percent on top of the state's 6.5 percent levy and a 2 percent transient lodgings tax. Property taxes fund portions of city, county, school and other special district budgets (e.g. fire, hospital, mosquito control, port, and other districts), but in the aggregate, the assessed

values of real and personal property upon which the taxes are levied are based on broader bases of value than visitors' travel expenditures.[3]

At the government level, Grant County is the principal fiscal entity with a portion of its budget funded by the county's share of sales and transient lodging taxes collected in unincorporated areas. In FY 1996 to 1997, the county had expenditures totaling $43.25 million and revenues of $42.24 million. Property tax revenues totaled $9.08 million (22 percent) while retail sales and use taxes raised $2.78 million (6.6 percent). The *Washington State 1991-1997p Travel Impacts and Visitor Volume* reported that 1996 travel-related spending generated $960,000 in county taxes and $6.31 million in state taxes (including the transient lodging tax which amounted to $204,700) (WDCT&ED, 1998). Most of the county's budget is supported by intergovernmental transfers from state and federal programs (OFM, 1998).

2.7 HAZARDOUS AND TOXIC MATERIALS SUMMARY

Hazardous and toxic materials of primary concern in the Columbia Basin are the chemicals associated with agricultural practices (agrichemicals). Other hazardous and toxic materials of concern include total suspended particulates (TSPs), high levels of naturally occurring elements, fecal coliform bacteria, dissolved solids, and public and industrial refuse.

2.7.1 Agrichemicals

Agriculture and related industries are the dominant economic activities on the Columbia Plateau. Agrichemicals currently in use on both irrigated and dryland farms adjacent to the management area include fertilizers, pesticides, herbicides, insecticides, fungicides, miticides, rodenticides, and other treatments. Aquatic herbicides are also used to control vegetation in and along the canal delivery system. Fertilizers entering surface waters affect nitrogen and phosphate nutrient loads.

Changes in the chemical quality of Columbia Plateau ground waters have been attributed to agricultural practices and activities. A report released by the Washington State Interagency Ground Water Committee (WIGWC) on "Nitrate Contamination of Ground Water in the Mid-Columbia Basin" indicated that approximately 20 percent of the domestic or public water supply wells analyzed had an average nitrate-nitrogen level above the state drinking water standard.

---

3 Property taxes paid by businesses primarily involved in providing lodging and services for visitors account for some proportion of the total levies on property, but the shares cannot be broken out with the data that are readily available. It seems reasonable to believe, however, that it would take a very large and unlikely decline in visitor- and recreation-related business to have a material impact on the fiscal stability of the jurisdictions containing the Banks Lake area attractions. One measure of the assessed value of real and personal property in the management area would be that of the two Grant County school districts that encompass the communities and area bordering Banks Lake: in fiscal year 1996 to 1997 that amounted to $120.15 million, which represented about four percent of the county's total assessed valuation of $3.03 billion. (Grant County Auditor, 1998) Property tax levy rates in the incorporated communities in the management area ranged $15.25-$15.50 per $1,000 assessed valuation in 1995 (GCDACC, 1998)

Consequently, a Ground Water Management Area was established in 1998 encompassing Grant, Adams, and Franklin counties. However, the ground water data gathered in the vicinity of Banks Lake indicates that nitrate-nitrogen contamination is not a public health concern at this time.

Commonly used pesticides typically have not been monitored in surface water or ground water in the Columbia Basin. However, Columbia River water and biota have been monitored for more persistent pesticides such as DDT and dieldrin, which are no longer used. Data indicate that over time, concentrations of these persistent chemicals are decreasing. Monitored pesticides, including currently used treflan, parathion, malathion, and thiodan are not typically found in the samples, indicating that these compounds are not being transported, are not persistent, and that their breakdown products are not subject to monitoring.

2.7.2 Fecal Coliform Bacteria and Dissolved Solids

Fecal coliform bacteria and dissolved solids are often carried along with eroded soils and water runoff/percolation. In areas grazed by livestock, particularly where cattle have direct access to surface waters and springs, increased nutrient loads and bacterial organisms from excrement can affect water quality and human health. During Banks Lake field surveys, problems due to livestock grazing have been noted at Bebe Springs, in portions of the northern reservoir area grazed under permit BL-04, and in areas grazed by trespass livestock (i.e., Barker Flat). The presence of human and other animal wastes in dispersed camping areas around the reservoir was noted in some areas, but is not considered a significant public health hazard at this time due to its relative infrequency of occurrence.

2.7.3 Public and Industrial Refuse

Public and industrial refuse generally is taken to local sanitary landfills operated by the counties, or to private landfills permitted by the WDOE to operate under the Environmental Protection Agency's (EPA) Resource Conservation and Recovery Act (RCRA) regulations for solid waste. Some industrial wastes require special disposal in permitted hazardous waste disposal facilities. However, none of the solid waste landfills located near the RMP management area are RCRA-permitted hazardous waste landfills. Solid waste landfills may accept small quantities of hazardous wastes, but the cumulative amount of these hazardous wastes is unknown.

Grant County operates a landfill south of Ephrata that accepts approximately 95 percent of the County's refuse. Another smaller landfill, the Delano Landfill, is located in Electric City. Existing monitoring wells can not demonstrate potential negative effects caused by the contents of these landfills. However, it is probable that they contain general farm waste materials, including empty pesticide containers.

Municipal solid waste collected from each of the Banks Lake neighboring communities (Electric City, Grand Coulee, and Coulee Dam) plus Elmer City, Wilbur, Creston, and Steamboat Rock State Park are taken to the Delano Landfill. Located off SR 155 south of the North Dam Rest Area, the landfill is within a mile of Banks Lake. However, it is unlikely that the landfill affects

Banks Lake water quality due to its low elevation relative to Banks Lake. The Delano landfill does not accept hazardous waste.

2.7.4 Other Sources of Potential Pollution

Various land use agreements (i.e., leases, licenses, permits) with Reclamation, WDNR, WDFW and SPRC exist within or adjacent to the RMP management area(see Chapter 3, Section 3.3 "Land Use Agreements" for specific details). Under these agreements, the lessee, licensee or permittee is required to maintain a weed control program to prevent the spread or establishment of noxious weeds. Pesticides that are highly toxic to people, fish or wildlife are not allowed. Each entity is responsible for either taking the appropriate weed control measures or reimbursing the administering agency for any weed control costs incurred as a result of the their failure to control weeds on the involved property.

According to information provided by the Grant County Noxious Weed Control Board, the RMP management area is monitored for weed control by the County, but treatment is administered by the WDFW and Reclamation. On occasion, subcontractors are contracted to conduct the County's prescribed weed control measures. Generally, Reclamation is concerned with Eurasian watermilfoil control in the waters of Banks Lake.

The Dry Falls Mini-Mart is newly constructed and is reported to have double-walled steel USTs with the necessary safety mechanisms in place.

2.7.5 Federal Regulatory Agency Databases

Applicable regulatory agency documents and lists of known or potential hazardous waste sites, landfills, and properties or facilities currently under investigation for potential environmental violations were reviewed to identify properties or facilities that may have the potential to adversely affect environmental conditions in the management area. Unless otherwise noted, the search distance radius was two miles from the four sites selected for the VISTA database search - Coulee City, Grand Coulee, Steamboat Rock State Park, and Grand Coulee Dam Airstrip. Hazardous waste sites greater than 0.5 miles from Banks Lake are not expected to have a negative impact on the reservoir (Sherry Minnick, 1998).

The following EPA and agency documents and lists were reviewed by VISTA Environmental Solutions, Inc. (VISTA), of San Diego, California:

- *US EPA National Priorities List (NPL)*
  The NPL List includes those sites determined by the EPA to require priority remedial action, and those sites for which Superfund finances have been allotted.

  There are no NPL sites listed on the VISTA database within two miles of the Banks Lake management area.

- *US EPA Corrective Action (CORRACTS) List*

The CORRACTS List is a compilation by EPA of the properties or facilities which EPA has issued a "corrective action order" pursuant to RCRA Section 3008 (h) when there has been a release of hazardous waste or constituents into the environment from a RCRA facility.

There are no CORRACTS sites listed on the VISTA database within two miles of the Banks Lake management area.

- *US EPA Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) List*
  The CERCLIS List is a compilation by EPA of the properties or facilities which EPA has investigated or is currently investigating for a release or threatened release of hazardous substances pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (Superfund Act).

  Databases were searched to 1.5 miles. No CERCLIS sites were listed on the VISTA database within 1.5 miles of the Banks Lake management area.

- *US EPA Emergency Response Notification System (ERNS) List*
  The ERNS List is a list compiled by EPA of the spills of potentially hazardous substances called in to the Coast Guard and other spill response centers across the US. Spill notifications included on this list have not necessarily been confirmed by EPA.

  Databases were searched to 1.2 miles. No ERNS sites were listed on the VISTA database within 1.1 miles of the Banks Lake management area.

- *US EPA Resource Conservation and Recovery Act (RCRA) TSD List*
  The EPA's RCRA program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRA Facilities List is a compilation by EPA of reporting facilities that store, transport, treat or dispose of hazardous waste.

  Databases were searched to 1.5 miles. No TSD facilities were listed on the VISTA database within 1.5 miles of the Banks Lake management area.

- *US EPA RCRA Generators or Notifiers List*
  The EPA's RCRA Program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRA Facilities List is a compilation by EPA of reporting facilities that generate hazardous waste.

  Databases were searched to 1.1 miles. No large quantity RCRA generators of hazardous waste were listed on the VISTA database within 1.1 miles of the Banks Lake management area. The Coulee Co-Op (Cenex Gas Station), located off U.S. Highway 2, is within the RMP management area and listed as a small quantity generator.

2.7.6 State Regulatory Agency Databases

- *Washington Department of Ecology (WDOE) Listing of Underground Storage Tanks (USTs) Reported in Washington State.*
  This listing is a compilation of site names and tank information for sites with USTs registered with WDOE.

  Databases were searched to 1.1 miles. Six USTs were listed on the VISTA database within 1.1 miles of the management area(see Table 2.5). Four sites are located in Coulee City and two in Electric City.

  Leakage from the USTs listed in Electric City potentially could enter Banks Lake as they are hydrogeologically up-gradient of the reservoir. The USTs listed in Coulee City are hydrogeologically down-gradient of Banks Lake and likely do not pose a hazard to the reservoir.

Table 2.5
Underground Storage Tanks Within or Near the
Banks Lake Management area

Site Name	Location
Coulee-Hartline School District	West Locust, Coulee City
Town of Coulee City (Fire Hall)	West Main, Coulee City
Fuller Auto Sales	Walnut, Coulee City
Frontier Corner	U.S. Highway. 2, Coulee City
Marshall French	Coulee Blvd., Electric City
Electric City Area HQ Site	Williams Street, Electric City

- *WDOE Leaking Underground Storage Tank (LUST) List*
  The LUST list is a compilation of sites with confirmed leaking underground storage tanks that have been reported to WDOE.

  Databases were searched to 1.5 miles. Eight LUST sites were listed on the VISTA database within 1.5 miles of the management area(see Table 2.6). Five sites are located in or near Grand Coulee, one in Electric City, and two in or near Coulee City. In all cases, contamination is limited to soil and ground water not reported to be impacted.

Four Grand Coulee and Electric City sites are reported cleaned up, and four additional sites are being cleaned up. Contamination is limited to soil in all cases. The two Coulee City sites, Dry Falls Café/Mini-Mart and Major Oil Company, are located within the management area. The Major Oil site is reported cleaned up while the Dry Falls Mini-Mart cleanup is on-going.

- *Washington Active Solid Waste Landfills (SWLF)*
  This list is provided by the WDOE and is a compilation of solid waste facilities currently in operation.

  Managed by the Regional Board of Mayors, the Delano landfill is located within 1 mile of the management area. The landfill accepts municipal solid waste from Electric City, Grand Coulee, Coulee Dam, Elmer City, and Steamboat Rock State Park. Ground water monitoring is conducted at the landfill as FDR Lake is down-gradient from the landfill site.

- *Washington Site Register (Toxics)*
  This list is provided by the WDOE and is a compilation of the state's Toxic Cleanup Program.

  Located within the management area, the Dry Falls Café and Mini-Mart is listed on the state's toxics list. Dry Falls Café is included on the toxics register because of a LUST (Minnick, 1998).

Table 2.6
Leaking Underground Storage Tanks Within or Near the Banks Lake Management area

Site Name	Location	Media Affected	Status
Flying J Grocery	Spokane Way, Grand Coulee	Soil	Reported Cleaned Up 08/15/91
Dam Site Building Center	A Street, Grand Coulee	Soil	Reported Cleaned Up 06/7/93
BPA Maintenance Facility	Grand Coulee Dam, Grand Coulee	Soil	Cleanup Started 09/25/91
Bureau of Reclamation	SR 155, Grand Coulee	Soil	Cleanup Started 08/28/89
Midway Mini-Mart	Midway, Grand Coulee	Soil	Cleanup Started 01/05/95
Electric City HQ Site	Williams Street, Electric City	Soil	Cleanup Started 07/01/94
Major Oil Company	U.S. Highway 2, Coulee City	Soil	Reported Cleaned Up 04/23/96
Dry Falls Café and Mini-Mart	Junction U.S. Highway 2 and SR 17, Coulee City	Soil	Cleanup Started 04/13/95