Land use along the existing portion of the W20 Canal is primarily irrigated farmland. The area where the W20 Canal would be extended is primarily grassland.

Land use along the Frenchman Hills Wasteway is primarily irrigated farmland. There is a small area of urban residential development adjacent to the canal in the town of Quincy, and the area near the mouth of the canal at Potholes Reservoir is arid steppe land managed as a wildlife area and as a state park. The Potholes Reservoir area is used for recreation, including camping, boating, and fishing.

Land use along the East Low Canal is a mixture of irrigated and non-irrigated farmland and arid steppe lands.

Land use in the Potholes Reservoir area includes irrigated farmland and arid steppe lands primarily managed for wildlife habitat, campgrounds, and boating facilities. The Moses Lake area includes urban uses and recreational uses along the lake, including residences and facilities for boating.

3.9.4.3 Columbia-Snake River Irrigators Association Voluntary Regional Agreement

The CSRIA represents farming operations in eastern Washington that irrigate about 250,000 acres of row crop, vineyard, and orchard lands. Their members have farming operations along the Columbia-Snake River system north from Brewster, reaching to the south along the John Day and McNary Pools**.** Some of the members own farming operations in the Yakima Valley and within the Columbia Basin Project area. The membership also includes several municipal service irrigators, including Brewster, Kennewick, West Richland, and the Kennewick Irrigation and Hospital Districts. Projects proposed for the CSRIA Voluntary Regional Agreement could participate in the program.

3.10 Cultural Resources

Because this is a programmatic EIS, the cultural resources overview of the large Management Program area is necessarily general. Some of the specific projects within the Management Program will require a more detailed cultural resource analysis at the project level. This section describes the legal framework for the protection of cultural resources and presents a general overview of the history and cultural resources of the area.

3.10.1 Legal Framework for Protection

Cultural resources are protected at both the state and federal level. Cultural resources are defined as buildings, objects, sites, or structures that are of historic, cultural, archaeological, scientific, and/or architectural significance.

Washington State Executive Order 05-05 establishes a review process by the Department of Archaeology and Historic Preservation (DAHP) and affected tribes for capital projects or land acquisition proposed by state agencies. Ecology has initiated the project review process for the Management Program with DAHP. Ecology may need to initiate the project review process in the future for specific projects proposed under the Management Program.

SEPA requires that cultural resources within a proposed project area must be identified, and that measures must be proposed to reduce or control impacts on these resources. Under SEPA, DAHP provides formal opinions on sites' significance and the impact of proposed projects on such sites. Other state laws governing cultural resources protect Native American graves (RCW 27.44), abandoned historic cemeteries (RCW 68.60), and archaeological sites (RCW 27.53); these laws contain clauses regarding the inadvertent discovery of cultural resources during activities such as construction.

Specific projects proposed under the Management Program may necessitate federal permits or funding, which would require compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. Section 106 requires that the effects of an undertaking on historic properties within the project's Area of Potential Effects (APE) must be considered. The federal code implementing Section 106 (36 CFR 800) includes a requirement that an effort must be made to identify historic properties.

The significance of the resources that may be affected by an action must be addressed using established criteria (36 CFR 60.4) for the National Register of Historic Places (NRHP). The criteria for NRHP eligibility are listed in 36 CFR 60 as follows:

> The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling and association, and
>
> (a) That are associated with events that have made significant contributions to the broad pattern of our history; or
>
> (b) That are associated with the lives of persons significant in our past; or
>
> (c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> (d) That have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 60).

If a resource is determined to be eligible under the NRHP, then Section 106 and its implementing regulations require that effects of the proposed project on that resource must be determined. If NRHP-eligible resources are identified that would be adversely affected by the project, then prudent and feasible measures to avoid or reduce these adverse impacts must be taken. In addition, the Advisory Council on Historic Preservation (ACHP) and the State Historic Preservation Officer (SHPO) must review and comment on these measures. The ACHP has adopted regulations (36 CFR 800) that implement this commenting authority.

The NHPA also requires the permitting or funding federal agency to conduct preservation-related activities in consultation with the SHPO, local governments, Indian tribes, and other interested parties.

Other federal laws that may apply at the project level include the Native American Graves Protection and Repatriation Act (PL 101-601), which regulates the inadvertent discovery of Native American human remains on federal or tribal land; the Archaeological Resources Protection Act (16 USC 470aa-470mm), which regulates excavation of sites on federal lands; and the American Indian Religious Freedom Act (42 USC §§ 1996, 1996a), which affirms the right of Native Americans to access their sacred places.

3.10.2 Overview of Cultural Resources in the Project Area

For the purposes of this programmatic EIS, the project area is considered to be all lands east of the Cascade Mountains to the Washington-Idaho border and south to the Columbia River. This encompasses all or part of 25 counties within Washington. Most of this area is within the cultural area generally known as the Columbia Plateau or Plateau region (Walker 1998); a smaller portion is considered part of the Southern Northwest Coast culture area (Suttles 1990). The area is considered rich in cultural resources because of the long history of occupation by tribal groups.

Cultural resources that might be potentially identified in the project area could represent any aspect of 11,000 years of human occupation and land use. Physical property types and landscape elements directly associated with past and present human behavior could include buried archaeological deposits and above-ground, built features such as rock cairns; landscape characteristics important to traditional Native American subsistence, spiritual, and religious practices; structures related to recent historic agricultural and industrial developments; and other features that are potentially significant to the ethnic identity of a social group.

Pre-contact archaeological resources could range in age from 11,000 BP (years before present) to AD 1800. Archaeological materials already documented in the region include Paleo-Indian artifact caches, lithic (stone) procurement sites, cairns, trails, camps and villages, food and medicine procurement sites (including hunting blinds, fish weirs, camas fields, berry processing areas), and burials. Historic resources may include structures, sites, or land alterations related to agriculture, transportation, homesteading, mining, logging, irrigation, orcharding, as well as historic cemeteries or graves of both Euro-American and Native American groups. Traditional cultural properties are presumed to be present in the project area and might include places that are important to sustaining community traditions or culturally important activities.

Because of the vastness of the project area and the potential for a new reservoir, it is important to understand the cultural resources previously identified within other reservoirs on the Columbia River. Table 3-26 summarizes the number of recorded cultural resources within 13 reservoir sites on the Columbia River. Cultural resources included in this table are predominantly archaeological and historic sites. The inclusion of Traditional Cultural Properties (TCPs) and the built environment would increase these numbers. The number of recorded cultural resources identified is affected by the year of dam construction, the year of archaeological investigation, and the surface area of the pool. It is probable that a new project would result in identification of a higher proportion of cultural resources due to more refined archaeological methods.

Table 3-26. Recorded Cultural Resources at Columbia River Reservoir Sites

Dam (year built)	Manager	Number of Historic Properties on Project Lands	Surface Area (acres)
Bonneville (1938)	Portland District USACE	57[1]	595
The Dalles (1957)	Portland District USACE	145[1]	
John Day (1968)	Portland District USACE	157[1]	
McNary (1953)	Walla Walla District USACE	181	37,000 (normal pool)
Ice Harbor (1959)	Walla Walla District USACE	62	8,375 (low flow, flat pool)
Lower Monumental (1961)	Walla Walla District USACE	197	6,590 (low flow, flat pool)
Priest Rapids (1959)	Grant County PUD	218	7,725 (normal maximum pool)
Wanapum (1963)	Grant County PUD	419	14,680 (normal maximum pool)
Rock Island (1933)	Chelan County PUD	51	3,120
Rocky Reach (1961)	Chelan County PUD	77	9,100
Wells (1967)	Douglas County PUD	29	9,740 (normal pool)
Chief Joseph (1955)	Seattle District USACE	500	8,400 (full pool)
Grand Coulee (1941)	U.S. Bureau of Reclamation	668	82,000

Sources: PUD No. 2 of Grant County 2003; U.S. Army Corps of Engineers 2006a, 2006b, 2006c; U.S. Bureau of Reclamation, personal communication 2006; Beckham and Baxter 1988; CJDCRMCG 1998; Dickson 2002; Griffin and Churchill 2001; Galm and Masten 1988; Roulette et al. 2001; Hamilton and Hicks 2003; Hartmann and Gill 2004; Nelson 2006; Miller 2001; Masten and Galm 1986; Scott 2003, Yu 2006.
[1] Washington state sites only

3.10.2.1 Distribution of Native Groups

In 1850, at least 25 Native groups lived in the Columbia Plateau region, with boundaries of some groups extending into Canada, Idaho, and Oregon (Ray 1936). Generally, one Native group is identified within the Northwest Coast portion of the study area (Suttles 1998). Today the reservation lands of the Confederated Tribes of the Colville Reservation, Spokane Tribe of Indians, Kalispell Tribe of Indians, and Confederated Tribes and Bands of the Yakama Nation are located within the study area. The Cowlitz Tribe does not have a reservation, but their traditional territory is also within the study area. The Chinook Nation, a non-federally recognized tribe, also has its traditional territory within the project area, as does the Wanapum Band. In addition, federally recognized non-Washington state tribes have ceded territories in Washington, including the Confederated Tribes of the Umatilla Indian Reservation and Confederated Tribes of Warm Springs in Oregon, and the Nez Perce Tribe and Coeur d'Alene Tribe in Idaho.

Linguistically, native peoples of the Columbia River Basin were either Salish speakers or Sahaptin speakers, with Salish generally spoken by groups to the north and Sahaptin spoken in the south (Ray 1936). The Chinookan language was spoken in the Northwest Coast portion of the project area.

3.10.2.2 Traditional Land Use

Traditional land use in the project area may have included hunting for birds and both small and large game; seasonal gathering of roots, berries, and other plant resources; and fishing. Fish of all types were caught in rivers, lakes, and streams through a variety of methods such as weirs, traps, platforms, or nets. Villages, seasonal camps, resource procurement sites, and ritual sites have been documented both archaeologically and ethnographically, revealing over 11,000 years of human land use in the project area.

The access to the spring and fall salmon runs was shared or traded with most other groups, both in and outside the region. Fishing camps were set up at narrow places on the Columbia River where dip nets or spears could reap the available bounty. While sedentary winter villages were established along the main river channel for winter resources and climate protection, summer foraging required a semi-nomadic existence as families moved from place to place collecting camas, roots, berries, and nuts. Hunting various localized game was supplemented throughout the year. Columbia River islands were often the locations of burials, as were areas adjacent to streams.

Today, different Native American groups continue to have access to their "usual and accustomed places" for a variety of traditional uses, including in areas outside of present-day reservations. In the Columbia River Basin this includes access to traditional fishing areas along the river and its tributaries, and hunting and gathering in shrub-steppe habitat.

3.10.2.3 Euro-American History of Region

The early nineteenth century saw the arrival of Euro-American explorers and fur traders in the Columbia River Basin. By mid-century, military forts had been established and missionaries had arrived.

Indian reservations were established in the Washington Territory by treaty with the federal government. The majority of the treaties were negotiated in 1855, with reservations developed to "[reduce] Indian land tenure, [concentrate] bands and tribes under the tutelage of the Bureau of Indian Affairs, [confine] through the presence of military posts near the reservations, and [transform] the native peoples into the surrounding majority community" (Beckham 1998:155). However, formal agreements were not reached with many of the groups in the northern Columbia Plateau. The immigration of Euro-American settlers, who often brought smallpox and measles epidemics; a gold rush near Fort Colville; and the expansion of the railroads into the traditional territories of Native groups fueled a series of military conflicts often called the Treaty Wars of 1855-1858 (Beckham 1998; Wilma 2003). Although conflicts occurred throughout the Washington Territory, many of the skirmishes were fought in what is today the project area. By 1858, most Indian people had been removed to reservations. Native groups retained rights to fish "in usual and accustomed places" under the terms of the treaties. Other treaty rights preserved included hunting, gathering, grazing, and water rights.

Industries such as mining, agriculture, and ranching grew in boom and bust cycles. Census data for Douglas County provide a glimpse of the growth throughout the region: 372 people were counted in 1885, then 838 in 1887, over 1,500 in 1892, and over 5,000 by 1910 (Secretary of State 2006). Agricultural interests promoted ways to increase reliable irrigation of crops and

irrigation districts, and other groups began forming at the turn of the twentieth century. For example, the Wenatchee Bridge Company was formed in 1904 to promote the construction of a bridge between Wenatchee and East Wenatchee. "[In] addition to offering a better and more dependable way of crossing the river, [the bridge also carried] irrigation water to a considerable acreage of fertile land in Douglas County. Available water [immediately resulted] in development of this land and [ultimately resulted] in greater business for Wenatchee merchants…and increased values to the land…" (Mitchell 1968:28). Dams were also proposed to provide irrigation and control flooding throughout the Columbia River Basin.

The importance of transportation on the Columbia River is longstanding. "The scene of considerable exploration and fur trade activity, the Columbia River was the most important transportation corridor in the Pacific Northwest during the early historic period" (Harvey 1989:4). The Columbia River continued to play an important transportation role after the discovery of gold in the northern interior of the state. Steamboats brought miners, supplies, and cattle to the area and returned with gold and silver. Steamboat travel supported the development of secondary transportation routes on land (Harvey 1989). It was not until 1888 that steamboats reached the upper Columbia River, advancing the settlements around Wenatchee and Lake Chelan. "By 1909, four transcontinental railroads traversed the state of Washington, with a network of feeder lines mainly serving agricultural, timber, and mining communities" (Harvey 1989:9). Automobile and air travel also shaped the region in the mid-twentieth century.

3.10.2.4 Archaeological Resources

Several overviews of cultural resources have been conducted for subregions of Washington. A total of 14 prehistoric study areas and 18 historic resource study units (comprising a variety of themes, including military, agriculture, and industry) were identified within Washington in the late 1980s.

The Mid-Columbia Study Unit, one of 14 prehistoric resource study areas, encompasses Benton, Franklin, Klickitat, and Walla Walla Counties (Galm et al. 1987). As of 1985, there were 620 prehistoric sites recorded in the Mid-Columbia Study Unit, with 89 percent of these associated with water; 75 percent were located within 1,000 feet of a river (Galm et al. 1987: 14, 16). The remaining 11 percent of recorded sites are mainly resource procurement or processing sites. There is likely a bias to this information due to the early focus on archaeological investigations in areas to be affected by hydroelectric projects. Even so, it is noteworthy that less than 17 percent of the sites were considered intact in 1987, with more than half either inundated or disturbed (Galm et al. 1987).

Within the Lower Columbia Study Unit (including Skamania, Clark, Cowlitz, and Wahkiakum Counties and part of Pacific County), there were 443 recorded sites by 1986 (Minor 1986). (Sites on the Oregon side of the Columbia River are not included in this evaluation.) Much of the focus of archaeological work was again biased toward riverine environments, although interior upland sites had become increasingly understood, especially within the Gifford Pinchot National Forest. As a result, approximately 53 percent of the sites consisted of "camps" (long-term and seasonal) and nearly 25 percent of the recorded sites were peeled trees.

The Eastern Washington Protohistoric Study Area covers archaeological sites dating from 1700 to 1850 within 20 counties east of the Cascade Range (Campbell 1987). As of 1986, 199

protohistoric sites had been recorded. Of these, at least 108 were located on a floodplain or terrace of a major river, at least 23 were located on islands, and at least 12 were located along streams. Accurate percentages cannot be derived because locations were not researched for 40 sites (Campbell 1987).

The Transportation Historic Resource Study Unit covers the entire state. Sites related to water, land, and air transportation have been identified throughout the state. By 1986, 208 transportation sites had been inventoried in Chelan, Kittitas, Yakima, Douglas, Grant, Benton, Franklin, and Walla Walla Counties (Harvey 1989). Transportation sites in the project area may include bridges, remnants of roads, trails, railroad structures, or trading posts.

Historic military forts are also common along the Columbia River. Fort Okanogan, Fort Colville, and Fort Walla Walla were all located close to the river; archaeological investigations have been conducted at all three forts (Chance 1972; Grabert 1968). Fort Colville was inundated by the backwaters of the Grand Coulee Dam, Fort Okanogan was inundated by the backwaters of the Wells Dam, and Fort Walla Walla was inundated by the backwaters of the McNary Dam.

Because the Management Program includes potential water storage facilities, it is helpful to examine the cultural resources identified at other reservoir locations on the Columbia and Snake Rivers. Table 3-26 summarizes the number of cultural resources that were identified at 13 of these projects.

The data in Table 3-26 provide only a cursory look at the cultural resources in the project area. Present-day survey techniques are more refined than those employed when many of these dams were constructed. Relicensing activities conducted by the Grant County and Chelan County PUDs have recently spurred extensive cultural resources surveys, thereby resulting in numerous new sites being recorded (including historic sites).

3.10.3 Cultural Significance of Rivers

The cultural significance of the Columbia River to Native American groups is evident in their art, oral traditions, and ceremonies. Petroglyphs and pictographs, images carved or painted on rock surfaces, are usually located near a permanent water source. "Pictographs are often located in out-of-the-way mountainous areas near rivers, lakes, springs, or streams…Petroglyphs are frequently found at place near rivers or lakes where people congregated, often where fishing was exceptionally good" (Boreson 1998). Numerous petroglyphs and pictographs have been recorded along the Columbia River. Just below Priest Rapids there were over 150 rock art sites on an island considered sacred to the Wanapum Band (the River People); this island was flooded in the backwaters of the Priest Rapids Dam.

The Columbia River also plays a role in the oral traditions and ceremonies of the Native American groups who lived and live along it. The Middle Columbia River Salishans (including the Sinkiuse, Wenatchee, Entiat, Chelan, Methow, Nespelem, Sanpoil, and Okanogan peoples, now concentrated on the Colville Reservation) believe that "the earth was a sky dome over an earth disk, with the Columbia River through the middle and the Cascade Mountains and Plains along the edge surrounded by ocean" (Miller 1998). Most Columbia Plateau groups, including the Middle Columbia River Salishan, conducted a First Salmon ceremony to commemorate "when the first Chinook was caught at a community weir" (Miller 1998). These ceremonies

continue today, highlighting the enduring importance of both salmon and the Columbia River to Native culture.

Native people do not view fish resources, water resources, and cultural resources separately, as the "cycle of salmon and other anadromous fish appearing and disappearing from the rivers ruled the rhythm of Indian life, [as] without a fish supply they were in danger of starving" (Netboy 1980).

3.10.4 Early Action Study Areas

3.10.4.1 Lake Roosevelt Drawdowns

Lake Roosevelt has been subject to numerous cultural resource studies since 1942 (Chance 1967, 1977, 1979, 1982; Collier et al. 1942; Masten and Galm 1986; McKie and Chance 1980; Galm 1994; Roulette et al. 2001). Most cultural resource surveys have focused on elevations between 1,220 and 1,290 feet above mean sea level (amsl) (Galm 1994:11.4). As of 2006, nearly 700 sites had been recorded on Lake Roosevelt project lands (Yu 2006).

Prehistoric resources at Lake Roosevelt include small and large habitation sites, resource procurement and processing sites, and ritual sites, while historic resources include dumps, structural remains, town sites, mines, missions, forts, cemeteries, and schools (Galm 1994:11.3). The majority of recorded prehistoric sites are between river mile (RM) 670 and RM 745; this is likely attributed to the large landforms that are exposed during drawdowns, which reveal a high density of sites (Galm 1994:11.6). South of RM 670, most of the land is over 100 feet below normal pool and the sites there are permanently inundated.

3.10.4.2 Supplemental Feed Route

The recorded cultural resources in the vicinity of the feed route alternatives are briefly reviewed below. Reclamation is conducting a detailed project-level evaluation of the three alternatives. As the APE has not been identified for these three alternatives, a five-mile buffer was evaluated for this report.

Crab Creek Route Alternative

There are 33 recorded cultural resources located within five miles of the proposed Crab Creek drainage area. Sites include archaeological and historic resources ranging from lithic material to historical agriculture. One of these sites, the Stratford School, is listed on the National Register of Historic Places (NRHP). None of the other sites have been formally evaluated and should be presumed eligible in lieu of a formal determination of eligibility. In addition, there is one probable burial site located within five miles of Crab Creek. Minimal surveys have been conducted in this area since 1995, and they have primarily focused on the Rocky Ford Creek area.

W20 Route Alternative

There are 79 recorded cultural resources located within five miles of the West Canal or W20 lateral canal drainage, including both pre-contact and historic resources. One of these sites, the

Stratford School, is listed on the NRHP. None of the other sites have been formally evaluated for inclusion on the NRHP and should be presumed eligible in lieu of a formal determination of eligibility. Three recorded burial sites and two possible burial sites are within five miles of the drainage. In addition, there are pre-contact caves, historic homesteads, pre-contact cairns, pre-contact talus pits, and a historic trail and railroad. Minimal testing has been conducted in this area and has primarily focused only on the nearby Rocky Ford Creek area. No surveys appear to have been conducted directly adjacent to the drainage since 1995. As construction of the West Canal itself was completed in 1955, the structure can be considered a historic resource, although as of January 2007, it has not been formally recorded at DAHP.

Frenchman Hills Route Alternative

There are 43 recorded cultural resources located within five miles of the West Canal and Frenchman Hills route drainage area. Archaeological resources include pre-contact cairns, camps, lithic materials, petroglyphs, rock alignments, rock shelters, and talus pits. Historic homesteads and structures are also in this area. None of the sites have been formally evaluated for inclusion on the NRHP and they should be presumed eligible in lieu of a formal determination of eligibility. Since 1995, an estimated 5 percent of the project area has been surveyed, in most cases in proximity to the Frenchman Hills Wasteway drainage area. The largest of these surveys was conducted on the southeastern portion of the drainage; however, no cultural resources were identified (Carmack 2004).

3.10.4.3 Columbia-Snake River Irrigators Association Voluntary Regional Agreement

No specific projects or locations are identified in the CSRIA VRA, so the potential affected cultural resources cannot be described. Some storage or conservation projects that may be proposed under the CSRIA may require additional cultural resource analysis in the future.

3.11 Transportation

The Management Program could affect surface transportation but is not likely to affect air transportation. Surface transportation modes serving the region include highways, railroads, and waterborne transportation.

3.11.1 Highways

Approximately 80,209 miles of federal, state, and local roads compose the public highway and road network in Washington. Included in that number are 764 miles of interstate highways (USDOT 2006). The largest interstate highways are Interstate 5, which traverses western Washington north-south from the Canadian border to the Oregon border on the Columbia River, and Interstate 90, which traverses much of the state west-east from Seattle to the Idaho border. The interstate and state highway system is managed by the Washington State Department of Transportation. Interstate and state highways in Washington are shown on Figure 3-18. Other public road systems are managed by county and municipal governments.

3.11.2 Railroads

Washington is served by a number of private railroads, including two large Class I railroads: the BNSF Railway and the Union Pacific Railroad. There are about 2,330 total miles of Class I railroad track in the state (USDOT 2000). Class 1 railroads in the project area are shown on Figure 3-18.

3.11.3 Water Transportation

The Columbia and Snake Rivers have a number of large ports that are important hubs for trans-Pacific shipping. On the Columbia River, barge shipping extends from Astoria, Oregon, to Tri-Cities in Washington. On the Columbia River, barge shipping is through the Ports of Pasco, Benton, Klickitat, Umatilla (Oregon), Vancouver, Portland (Oregon), and Kalama. Barge shipping on the Snake River extends from Pasco to Lewiston, Idaho. On the Snake River, barge shipping is through the Ports of Walla Walla and Clarkston. Tourist cruise ships also operate in the same segments of the Columbia and Snake Rivers.

3.11.4 Early Action Study Areas

3.11.4.1 Lake Roosevelt Drawdowns

Transportation adjacent to Lake Roosevelt and the areas that would receive additional water supplies is primarily land-based by road and rail. New water supplies could be provided as far down the Columbia River as the Tri-Cities, where waterborne transportation is also available.

Instream flow augmentation would occur within the Columbia River, which is used for barge transportation.

3.11.4.2 Supplemental Feed Route

Transportation in all of the areas being considered for the supplement feed route is land-based via road or rail. Interstate 90 passes south of Moses Lake and north of Potholes Reservoir. The BNSF Railway has a rail line that passes to the north of Moses Lake and south of Pinto Dam.

Crab Creek flows under State Route 28 and county roads between Stratford and Moses Lake. There are also several crossings of the BNSF Railroad. The W20 Canal flows under State Route 28 and the BNSF Railroad in a Naylor Siphon. Several county roads are located along the proposed route.

The Frenchman Hills Wasteway is crossed by two major county roads that will require expanded culverts – Dodson Road and Road C SE.

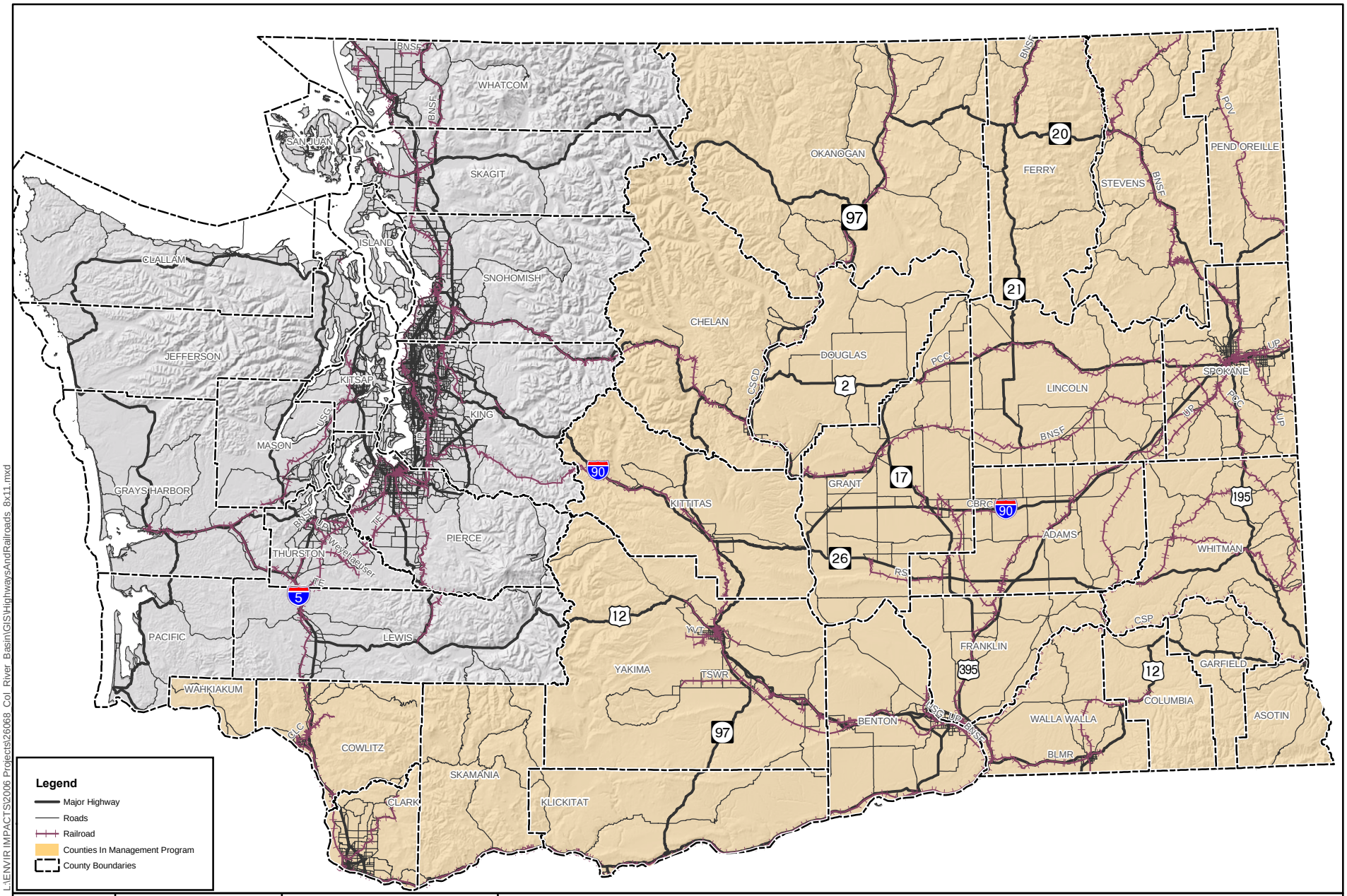

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FIGURE 3-18

MAJOR TRANSPORTATION ROUTES

COLUMBIA RIVER WATER MANAGEMENT PROGRAM EIS

WASHINGTON

3.11.4.3 Columbia-Snake River Irrigators Association Voluntary Regional Agreement

The area for this proposed VRA is not defined in the application materials, but the organization includes membership throughout the project area. Therefore, any transportation systems in the project area could be affected.

3.12 Recreation and Scenic Resources and Aesthetics

The Management Program project area includes a variety of recreation and scenic resources. Recreation areas include parks, monuments and historic areas, wildlife refuges, wilderness areas, and multi-use forest and range areas. Many parts of the project area have high scenic value, and it contains one designated national scenic area. Figure 3-19 shows the designated recreation and scenic areas located in the Management Program project area.

3.12.1 Recreation Resources in the Management Program Project Area

Waters and the adjacent land areas in the Management Program project area are used extensively for recreation. State residents and visitors enjoy a multitude of activities such as sightseeing, bird watching, hunting, fishing, boating, beachcombing and other water-oriented activities.

The types of water-oriented recreational opportunities are determined by the nature of the water body. For example, whitewater rafting requires free-flowing rivers with adequate flows to create whitewater conditions. Conversely, lakes and reservoirs are generally more conducive to power-boating and windsurfing than free-flowing streams. If the character of a water body is changed through flow alterations, such as construction of a dam, associated recreational opportunities may change as well. Similarly, if the quality of water in a lake or stream changes, it may alter the use of the water body for recreation. For example, bacterial or chemical contamination in a water body may make it unsuitable for swimming or fishing. An increase in water temperature in a lake may alter fish populations, thereby potentially reducing the numbers or eliminating cold water fish species (e.g., some types of trout) and creating conditions more conducive for warm water fish species (e.g., bass).

Fishing and hunting are important recreational activities in the Management Program area. Figures 3-20 and 3-21 show fish and wildlife regions, Washington Department of Fish and Wildlife (WDFW) water access sites, and WDFW Wildlife Areas in the Management Program project area. Hunting opportunities are also available on other public lands and private lands in the project area.

WDFW compiles annual statistics for hunter effort in Washington State. In 2005, hunting effort for deer was highest in Region 1. As defined by WDFW, Deer Areas exist in Klickitat, Grant, Adams, Columbia, Walla Walla, and Whitman Counties.

Elk hunting effort was highest in Region 5. As defined by WDFW, Elk Areas exist in Lewis, Wahkiakum, Cowlitz, Skamania, Klickitat, Yakima, Kittitas, Chelan, Douglas, Benton, Columbia, Garfield, and Asotin Counties.

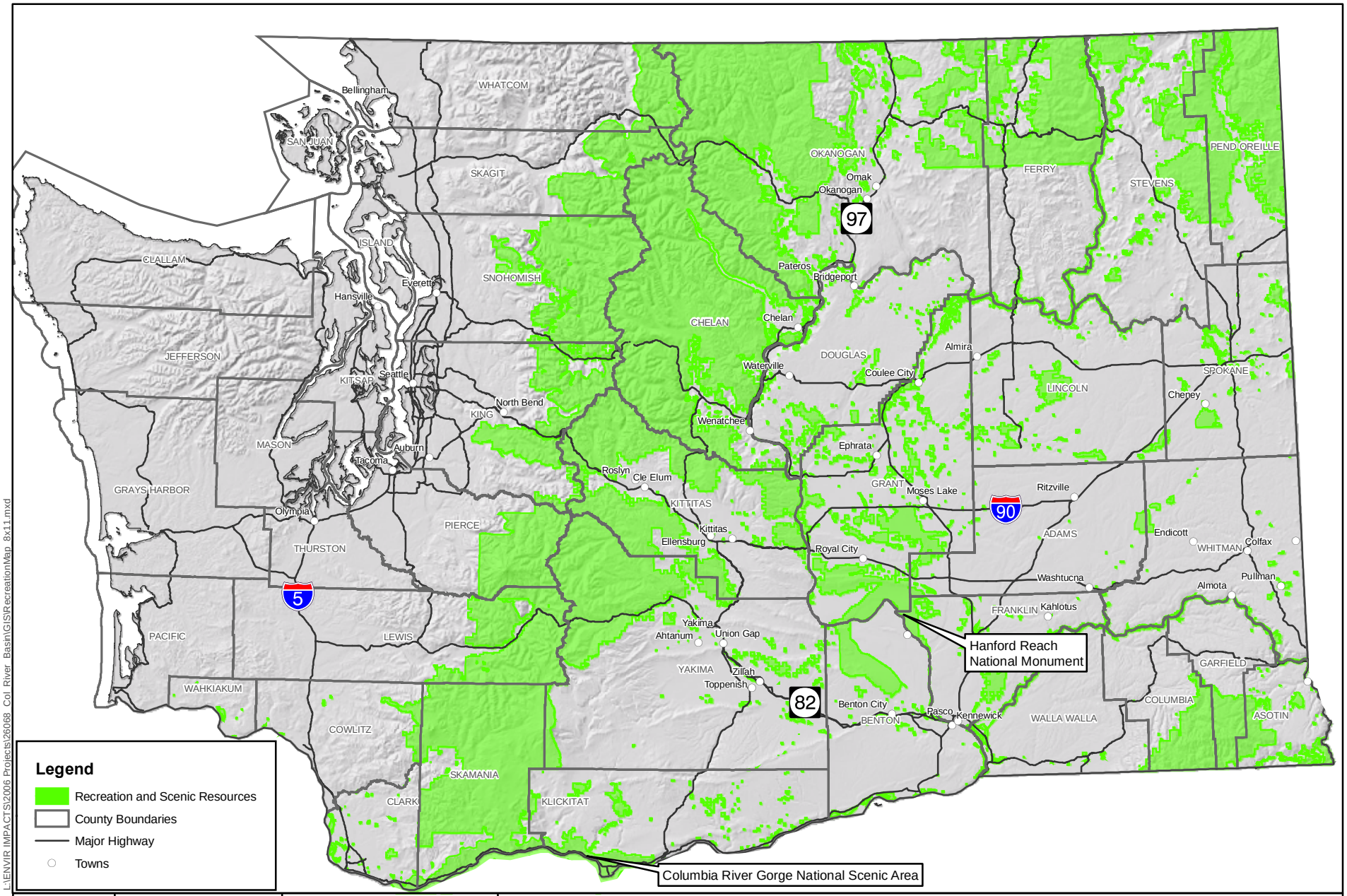

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FIGURE 3-19

DESIGNATED RECREATION AND SCENIC RESOURCES IN THE PROJECT AREA

COLUMBIA RIVER WATER MANAGEMENT PROGRAM EIS

WASHINGTON

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FIGURE 3-20

WDFW WILDLIFE MANAGEMENT REGIONS

COLUMBIA RIVER BASIN PROGRAMMATIC EIS

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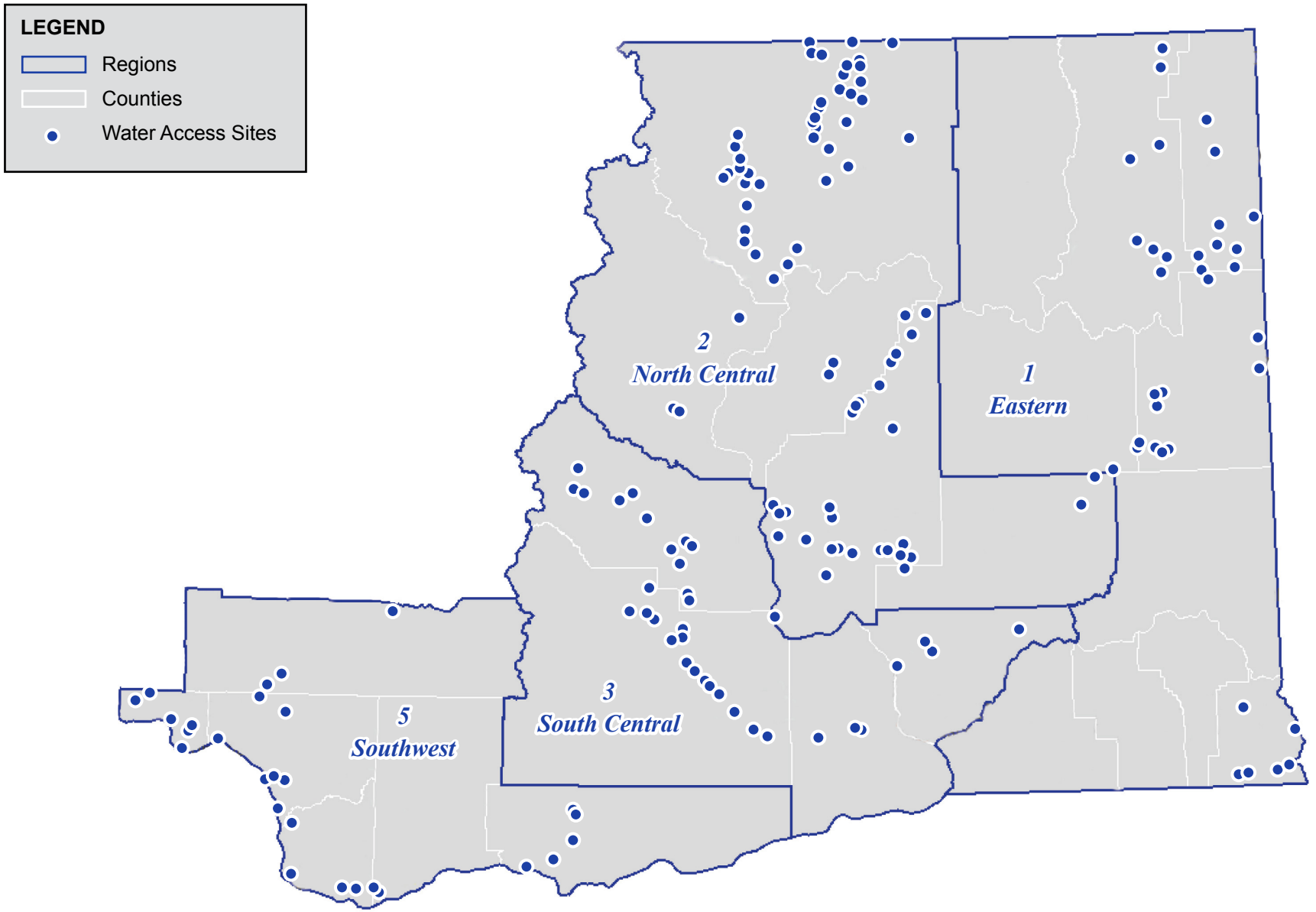

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SOURCE: Washington Department of Fish and Wildlife.

FIGURE 3-21

WDFW WATER ACCESS SITES

COLUMBIA RIVER BASIN PROGRAMMATIC EIS

WASHINGTON

Hunting effort for duck was highest in Region 2. Duck hunters in Grant County made up 75 percent of all duck hunters in Region 2, and duck hunters in Clark County made up 40 percent of all duck hunters in Region 5.

Pheasant hunting effort was highest in Region 1 in 2005. Similar to duck hunters, a majority of hunters (nearly 70 percent) in Region 2 pursued pheasant in Grant County. Pheasant release sites exist in Ferry, Okanogan, Douglas, Grant, Lincoln, Whitman, Adams, Kittitas, Yakima, Franklin, Walla Walla, Columbia, Garfield, Asotin, Klickitat, Clark, and Lewis Counties.

Goose hunting effort in 2005 also occurred in Regions 1, 2, 3 and 5, with the majority of hunters in Region 2 (75 percent) pursuing geese in Grant County. Based on the most recent data, Grant County sees a substantial amount of bird hunting effort compared to other parts of Region 2.

Table 3-27 provides additional hunting data for selected species in the Management Program project area from 2005. The total number of hunters and days spent hunting are summarized.

Ecotourism activities relating to wildlife are also important recreational activities that are growing in popularity. Wildlife-related festivals in the Management Program project area include the Othello Sandhill Crane Festival, held annually at the end of March; the Leavenworth Spring Bird Festival, held annually at the end of May; the Fall Festival of Foliage & Feathers, last held in Walla Walla in October 2003; the Ephrata Sage and Sun Festival, held annually the second weekend in June; the "Balde" Eagle Festival, held annually in the Grand Coulee Dam area during mid-February; and the Wenatchee River Salmon Festival, held annually in Leavenworth during late September.

Table 3-27. Hunting Effort by Region, 2005

	Deer Hunters	Days Hunted	Elk Hunters	Days Hunted	Duck Hunters	Days Hunted	Pheasant Hunters	Days Hunted
Eastern Region (1)	**45,449**	**219,993**	8,770	39,275	3,303	19,681	**10,881**	**56,021**
North Central Region (2)	23,913	111,666	1,335	5,137	**7,675**	**48,636**	7,624	39,136
South Central Region (3)	16,877	78,461	24,708	135,382	5,147	33,598	6,709	32,838
Southwest Region (5)	27,337	165,102	**25,798**	**148,150**	2,154	28,986	1,259	7,432

Bold entries represent regions for which the most hunting effort was expended for the selected species in 2005.

3.12.2 Scenic Resources and Aesthetics

Washington's wide variety of natural settings and climate provides abundant scenic resources. Among the scenic resources in the Management Program project area are coastal and estuarine waters and associated beaches, rivers, mountain ranges, lakes, wetlands, and the wide-open vistas of the Columbia River Basin farmland and high desert. The Interagency Committee for Outdoor Recreation estimates that 50 percent of the approximately 587,000 people who partake in sightseeing activities each year in Washington do so at scenic areas (Interagency Committee for Outdoor Recreation 2002).

The Management Program project area contains numerous rural and natural areas that are largely undeveloped, or developed primarily for outdoor recreation and wildlife habitat conservation.

The many wildlife refuges also contribute to the scenic quality of the region by preserving areas of special vegetation, often associated with surface or ground water, that contrast with the cultivated or more sparsely vegetated surrounding landscapes. Some local governments have land use plans and/or zoning code or ordinances that require aesthetics to be considered when permitting for development occurs. The Management Program project area includes the Columbia River Gorge National Scenic Area, which provides federal protection of scenic resources adjacent to a portion of the Columbia River, and the Hanford Reach National Monument, which protects the last free-flowing stretch of the Columbia River (Figure 3-19).

3.12.3 Early Action Study Areas

3.12.3.1 Lake Roosevelt Drawdowns

Lake Roosevelt is approximately 150 miles long and is nearly surrounded by the Lake Roosevelt National Recreation Area (NRA). This recreation area is a largely natural area with recreational facilities for boating and tourism, including 22 public boat launches, 27 campgrounds, and three marinas managed by the National Park Service. Motorboats, canoes, sailboats, houseboats, and other types of watercraft are served at these facilities, and houseboats, boats, and moorage slips are available to rent at most marinas. Visitation to the Lake Roosevelt NRA has been approximately 1.3 million to 1.5 million in recent years.

Lake Roosevelt is used for boating, swimming, fishing, wildlife viewing, hiking, and other recreational activities. The recreation area is also considered to have high scenic value. The lake is characterized by a wide daily fluctuation in the lake level due to power demand, water releases for flood control, and water releases for instream flow maintenance. This affects boating and other waterfront facilities because they must be designed to accommodate this fluctuation. The water level fluctuations also expose large areas of shoreline and mud flats.

Municipal and industrial uses that could receive water in non-drought years would be located in the Columbia Basin Project area**.** Many of the municipalities that could receive water own and operate local parks used for a variety of recreational purposes. The Odessa Subarea is primarily agricultural but also contains wildlife areas that are dependent on ground water and surface water supplies (see Figure 3-19).

Water users on the Columbia River who have interruptible water rights include agricultural, municipal, residential, and industrial users, which are located within one mile of the mainstem of the river, primarily in the central Columbia River Basin. Depending on the definition adopted for the mainstem, this could also include a one-mile distance from the backwater areas on tributaries of the Columbia River as well. As shown on Figure 3-19, there are many recreational resources located adjacent to the river, and some of these may currently be served by interruptible water rights.

Instream flow augmentation would occur within the Columbia River downstream of Lake Roosevelt. The Columbia River is used for fishing, boating, and swimming and contributes water to several wildlife areas.

3.12.3.2 Supplemental Feed Route

Upper Crab Creek includes publicly owned lands managed for wildlife and used for wildlife-related recreation, some of which are adjacent to the stream.

The area where the W20 Canal would be extended does not include any wildlife refuge or other recreation or scenic resources.

Land along the Frenchman Hills Wasteway is primarily irrigated farmland. At its lower end, the Wasteway enters the Potholes Wildlife Area, which abuts the southeast side of the reservoir. At the north end of the Potholes Reservoir, the Potholes Wildlife Area is also managed for habitat and wildlife-related recreation. Potholes State Park is also located near the outlet of the wasteway and features camping, swimming, and boating facilities. Potholes Reservoir annually hosts two fishing tournaments: the Potholes Bass Tournament and the Rod Meseberg Spring Walleye Classic.

The East Low Canal area includes a number of small publicly owned areas managed for wildlife habitat.

The Potholes Reservoir area includes lands primarily managed for wildlife habitat—Potholes Wildlife Area and Desert Wildlife Area. Potholes State Park is located on the reservoir and has camping, swimming, and boating facilities. The Moses Lake area includes recreational uses along the lake, including residences and facilities for boating. Moses Lake has three public boat launches and annually hosts Moses Lake Regatta (boat races) during late April. Several bass fishing tournaments and the Moses Lake Walleye Derby are also held on an annual basis.

3.12.3.3 Columbia-Snake River Irrigators Association Voluntary Regional Agreement

The area for the proposed CSRIA Voluntary Regional Agreement (VRA) is not defined in the application materials, but the organization includes membership over a broad portion of the Columbia River Basin in Washington. Therefore, any recreation and scenic resources in the Management Program project area could be affected by projects proposed under the VRA.

3.13 Public Services and Utilities

The Management Program project area encompasses a large region that consists of expansive rural areas, a few small towns and cities, and urban development concentrated around Spokane, Wenatchee, the Tri-Cities, and Vancouver. The region also features major regional water supply systems for irrigation and municipal uses. Substantial electrical generation facilities in the region (primarily hydropower facilities on the Columbia and Snake Rivers) provide power for much of the western United States.

This section discusses public services and utilities under three categories: water supply and regional water use, public services, and public utilities.

3.13.1 Water Supply and Regional Water Use

Water supplies for municipal and industrial uses are generally provided by local government agencies such as cities and public utility districts (PUDs), while irrigation water supplies are generally distributed by irrigation districts, which are quasi-municipal agencies.

Several municipalities in the Columbia River Basin (White Salmon, Greater Wenatchee, the Tri-Cities area, Brewster, and Bridgeport) have very limited water supplies that currently constrain their growth and economic development or are expected to do so in the foreseeable future. The municipal supply of water for the City of Wenatchee, East Wenatchee Water District, and Chelan County PUD is provided by a regional water system operated by the City of Wenatchee. These cities are located along the Columbia River, and the primary issue with their limited water supply is the availability of new water rights to serve future growth.

Current and future out-of-stream needs for water from the Columbia River were estimated for the Columbia River Initiative in 2004 and are shown in Table 3-28. Approximately 485,000 acre-feet of water is required for out-of-stream uses on the Columbia River (Ecology 2004).

Water from the Columbia River could be withdrawn anywhere between the Canadian border and Bonneville Dam. The Management Program also includes the Snake River mainstem, but a corresponding water needs assessment has not been developed for the Snake River.

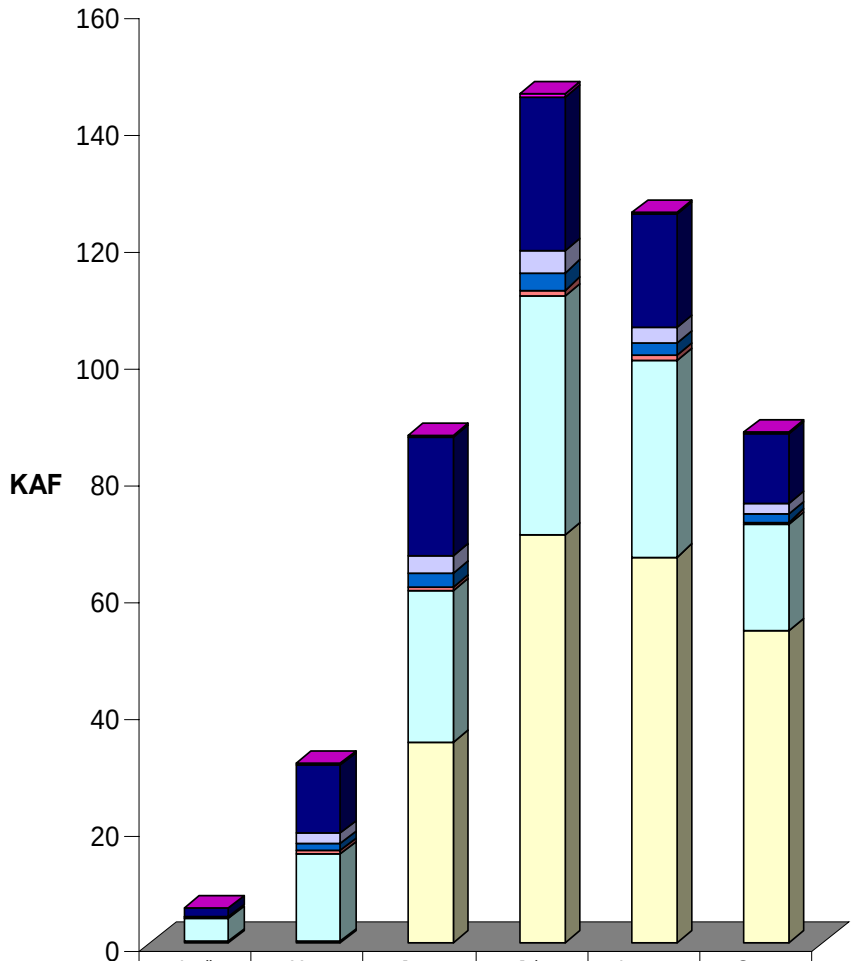
Table 3-28. Estimated Water Needs

	Estimated amount of water required to meet out-of-stream needs (KAF)*		
	Irrigation	**Municipal and Industrial**	**Total of Irrigation, Municipal and Industrial**
Drought permits to complement interruptible water rights	29	4	33
Permits issued in 2003	39	89	128
Pending applications	237	33	270
Future growth	47	7	54
Total	352	133	485

Source: Ecology 2004
*KAF= thousand acre-feet (an acre-foot is the amount of water it would take to cover an acre one foot deep.)

Demand for water from the Columbia River is greatest during July and August. During these months, water needs for irrigation as well as municipal and industrial needs are higher. Figure 3-20 shows the predicted water withdrawals, by month, that were estimated for the Columbia River Initiative. The amount of water used per month is based on existing patterns of water use by municipal, industrial, and agricultural users. The amount of water from each pool is based on Huppert et al. (2004). The Management Program would not be limited to the amounts of water shown in Figure 3-22, nor is it a certainty that these water supplies can be provided. This figure

is provided primarily as an illustration of the expected fluctuation in demand for water along the mainstem of the Columbia River. For a more complete discussion of water needs for irrigation and other uses, see Section 3.4.



	April	May	June	July	August	Sept
Chief Joseph	0.0203	0.1618	0.2817	0.3633	0.2654	0.1663
Wells	1.4753	11.7563	20.4616	26.3886	19.2827	12.0841
Rocky Reach	0.2112	1.6830	2.9293	3.7778	2.7605	1.7299
Rock Island	0.1684	1.3422	2.3361	3.0128	2.2015	1.3797
Wanapum	0.0506	0.4032	0.7017	0.9050	0.6613	0.4144
Priest Rapids	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
McNary	3.8236	15.0277	25.8882	41.0735	33.7732	18.2622
John Day	0.2914	0.3552	34.4988	69.9963	66.2374	53.5393
Dalles	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Bonneville	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Month

Figure 3-22. Predicted Water Withdrawals Estimated for the Columbia River Initiative

3.13.2 Public Services

Public services in the region are provided by tribal, federal, state, county, and local governments, as well as by volunteer fire departments and other volunteer groups in many areas, especially rural areas. Services include emergency fire and police services, education, health services, recreation programs, and other services.

Demand for public services is largely dependent on population growth, which is described in Section 3.9. Other factors that affect demand for services and the cost of delivering services are the density of development and the economic climate of the region. In low-density rural areas, it is too expensive for governments to provide some services, which is why volunteer fire departments and similar services have formed in some areas. During periods of slow or negative economic growth, the demand for public services such as health care or housing tends to increase.

3.13.3 Public Utilities

Public utility districts (PUDs) or cooperatives provide electricity service to most of the Management Program project area. Of these, the Douglas County, Chelan County, and Grant County PUDs operate dams on the Columbia River. The region is served by two major natural gas pipelines and three suppliers (OTED 2001).

Major hydropower generation facilities in the Management Program project area include Grand Coulee, Chief Joseph, Wells, Rocky Reach, Rock Island, Wanapum, Priest Rapids, McNary, John Day, The Dalles, and Bonneville Dams on the Columbia River, and the Ice Harbor, Lower Monumental, Little Goose, and Lower Granite Dams on the Snake River. There are also nuclear, small hydropower, wind-powered, and natural gas-fired electrical generation facilities in the Management Program project area.

Wastewater and solid waste utilities are provided by counties and cities. Outside of urban areas, in some cases wastewater treatment is provided by private treatment facilities serving individual developments. In most rural areas, wastewater treatment is provided through individual private septic systems. Major regional landfills include the Roosevelt Regional Landfill in Klickitat County and Asotin County Regional Landfill. The Spokane Regional Solid Waste System operates a waste-to-energy incinerator.

3.13.4 Early Action Study Areas

3.13.4.1 Lake Roosevelt Drawdowns

Public services and utilities near Lake Roosevelt are provided by Lincoln, Stevens, Ferry, and Okanogan Counties, and the Cities of Grand Coulee and Coulee Dam and Kettle Falls. Lake Roosevelt provides water for the Grand Coulee hydropower facility and irrigation water for the Columbia Basin Project. Grand Coulee Dam is managed by Reclamation. Power produced by the dam is coordinated as part of the Federal Columbia River Power System.

Municipal and industrial uses that could receive water in non-drought years are located in the Columbia Basin Project area, which includes Douglas, Lincoln, Grant, Franklin, and Adams Counties.

In the Odessa Subarea, public services and utilities are provided by Lincoln, Grant, Franklin, and Adams Counties. Irrigation water is provided by pumping from private wells.

Water users in the Columbia River Basin who have interruptible water rights are primarily located in the central Columbia River Basin, in Benton, Kittitas, Chelan, Douglas, Lincoln, Grant, and Franklin Counties.

Instream flow augmentation would occur within the Columbia River downstream of Lake Roosevelt and thus could affect any water suppliers or downstream hydroelectric facilities on the Columbia River mainstem.

3.13.4.2 Supplemental Feed Route

The proposed routes for the Supplemental Feed Route are all within the service area of the East Columbia Basin Irrigation District or the Quincy Columbia Basin Irrigation District. A variety of public services and utilities are located along the proposed routes. Several large powerlines cross the area.

3.13.4.3 Columbia-Snake River Irrigators Association Voluntary Regional Agreement

The area for this proposed VRA is not defined in the application materials, but the organization includes membership throughout the region extending from Bonneville Dam to the Washington borders with Idaho, Oregon, and Canada. Therefore, any public services and utilities in that region could be affected.