APPENDIX A

BIOLOGICAL ASSESSMENT

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1.0 INTRODUCTION

The U.S. Army Corps of Engineers (Corps) is evaluating a proposal to maintain the existing levee system within the Snake and Gros Ventre Rivers in Teton County, Wyoming. The purpose of this project is to provide emergency repairs and periodic maintenance of several Federal, State, and private levees within the river channel and to protect the surrounding area from periodic flood stages. The bald eagle, a Federally endangered species, is a year-round resident that uses the project area. The peregrine falcon and whooping crane are Federally endangered species that are summer residents and migrants in the project area. The project area is within 2 miles of territories occupied by the grizzly bear, a Federally threatened species. Section 7 of the Endangered Species Act (1973) requires an assessment of the effects of any Federal project on threatened or endangered species in the project area.

This Biological Assessment is prepared in compliance with the Endangered Species Act. The objective of the assessment is to evaluate whether the proposed project is likely to adversely affect each threatened or endangered species in the project area.

2.0 PROJECT DESCRIPTION

Several levees have been constructed by Federal, State, and local agencies and private citizens along the Snake and Gros Ventre Rivers in Jackson Hole beginning south of Moose, Wyoming. Levee construction was initiated in the early 1950s, and annual maintenance and emergency repairs are carried out by Teton County and the Corps. The study area on the Snake and Gros Ventre Rivers includes the upstream end of the Federal levee system from river mile (RM) 964.5 downstream to the lower end of the levees at RM 940. The study area also includes the Gros Ventre River from its confluence with the Snake River upstream to the boundary of Grand Teton National Park, a distance of approximately 2 miles.

2.1 LEVEE MAINTENANCE ACTIVITIES

The existing levees within the project boundaries currently receive some degree of annual maintenance. If the proposed action is implemented, regular maintenance activities occurring during the year would include:

1) Spring snow removal. The tops of all levees would be plowed, typically in early April, to allow access for patrol vehicles and let the levees dry out to accommodate heavy equipment traffic during emergency repairs.

2) Levee patrol. Daily patrol of all levees is conducted during daylight hours of the spring flood peak.

3) Emergency action. Flood fights occur as needed at problem areas during spring flow peaks. This typically lasts for 1/2 to 2 days at any given site, and involves 20-25 dump trucks, 4-6 bulldozers, 2-3 track-mounted backhoes, and emergency repair crews at the levee site.

4) Rock quarrying and stockpiling. Levee maintenance requires a regular supply of rock for levee repairs or reconstruction. This operation would involve extraction of rock for riprap and backfill from an upland quarry, possibly at a new site, and hauling by truck to a number of stockpile sites at intervals along the levee system.

5) Levee rehabilitation. This action includes selective reinforcement or reconstruction of weak or damaged levee sections. It typically occurs after high flows have receded, and involves relatively short sections of levee.

6) Debris clearance. Flood flows periodically leave snags on or near the levees, in a position to create deflection flow damage. Periodic removal of approximately 200 snags per event would occur in the fall, probably on an annual basis.

7) Culvert clearing. Culverts providing for drainage flow would require periodic removal of debris that could cause clogging.

8) Vegetation removal. Trees and other large perennial vegetation would be periodically removed from the levee surfaces using mechanical means.

9) Access road maintenance. Roads that provide access to the levee system require periodic plowing, grading and/or gravelling.

2.2 ALTERNATIVE A - NO ACTION

With Alternative A, the Corps would not take over long-term maintenance of any of the levees within the Snake-Gros Ventre Rivers levee system. However, the Corps assumes that existing conditions would continue. Specifically, Teton County and/or other entities would likely continue to both maintain the Federal and the nonfederal levees, while the Corps would continue to provide emergency assistance.

2.3 ALTERNATIVE B - MAINTAIN ALL LEVEES

With Alternative B, the Corps would take over maintenance of all levees as a Federal project. This would include every Snake River segment from the top of the Federal levee at Grand Teton National Park (RM 964.5) to South Park (RM 940), and three Gros Ventre levees. Rock for

levee maintenance would be supplied from the Walton Quarry, at least in the immediate future. A number of additional sites are under consideration, but any plans for further quarry development would require a separate EIS supplement. Levee maintenance activities would be as described in Section 2.1.

3.0 BALD EAGLE DISTRIBUTION AND HABITAT REQUIREMENTS

3.1 DISTRIBUTION

Bald eagles in the Greater Yellowstone Ecosystem (GYE) occur in three geographically distinct population units (Kurt and Swenson 1983, Swenson et al. 1986). These units include the Yellowstone Unit (YU) on the Yellowstone Plateau; the Continental Unit (CU) along the Madison, Red Rocks, and Henrys Fork rivers; and the Snake Unit (SU) along the Snake River and its tributaries including Jackson Lake, Wyoming (Swenson et al. 1986). The population in the GYE is the largest breeding population in the Rocky Mountains south of Canada (Swenson et al. 1986).

During 1982, there were 50 to 58 breeding pairs and 180 to 210 wintering bald eagles in the GYE. Of these, approximately 24 breeding pairs occurred in the SU, which includes the study area (Swenson et al. 1986, U.S. Fish and Wildlife Service (USFWS 1988)). From 1960-1982, the population of bald eagles in GYE appeared stable or increasing (Swenson et al. 1986). Reproductive rates averaged 0.98 young per occupied nest, with 60 percent of occupied nests producing young (Swenson et al. 1986). Both estimates of reproduction rates are slightly below recovery goals (1.0 young per occupied nest, greater than 65 percent nesting success) established for bald eagles in the Pacific Northwest Region (USFWS 1986).

Bald eagle wintering movements are influenced by location and availability of prey (Isaacs and Anthony 1987, DellaSala et al. 1989). In the YU where food is scarce, most adults (82 percent) and subadults (99 percent) leave the area in search of more abundant winter food supplies (Swenson et al. 1986). In contrast, the SU, which typically contains abundant wintering food supplies, has experienced an influx of adults from other areas and a higher (48 percent) retention of wintering subadults (Swenson et al. 1986). High proportions of subadults on the wintering grounds usually reflect abundant overwintering food supplies (Isaacs and Anthony 1987, Keister et al. 1987, DellaSala et al. 1989).

3.2 HABITAT REQUIREMENTS

3.2.1 Forage Habitat

The diet of bald eagles is highly varied and influenced by seasonal changes in prey availability and weather conditions (McClelland et al. 1982, Isaacs and Anthony 1987, Keister et al. 1987). Analysis of food pellets collected at nest sites in the SU indicate that at least half

of the food items consumed by eagles were fish (Swenson et al. 1986). Of the prey items identified, most (72 percent) were Utah suckers (Catostomus ardens). Cutthroat trout (Salmo clarki) were also an important prey item consumed by eagles during the spring spawning season (Swenson et al. 1986). Waterfowl, deer, and elk carrion were primarily consumed by overwintering eagles (Swenson et al. 1986).

3.2.2 Nesting Habitat

Bald eagles in the SU nest primarily in riparian areas with most nest sites occurring in narrowleaf cottonwood (Populus angustifolia), blue spruce (Picea pungens), Engelmann spruce (P. engelmannii), and Douglas-fir (Pseudotsuga menziensii) (Swenson et al. 1986). Mean elevation and distance from nests to water have been estimated at 6,000 feet (Kurt and Swenson 1983) and 200 feet (Swenson et al. 1986), respectively. Bald eagles do not have rigid requirements for nest tree species and size but tend to select the most desirable tree or stand closest to an early season food supply (Swenson et al. 1986). Most nesting territories in the SU are along mouths of peripheral streams and about 55 percent are areas of private ownership (USFWS 1988). Approximately 70 percent of the nesting territories in the SU are considered vulnerable to habitat losses from nearby development (Wood 1989, personal communication).

In the SU, bald eagles begin courtship behavior and nest building in February (Starkey, 1990, personal communication). Egg laying typically occurs in March, hatching in April and fledging in July, although fledging activity can range into mid-August (Swenson et al. 1986, USFWS 1989). The critical nesting season therefore extends from early February through mid-August.

3.3 RESPONSE TO DISTURBANCES

Effects of human disturbance on nesting bald eagles varies with nesting phenology and screening vegetation. Disturbances early in the nesting season are more severe than those occurring at later times (Mathisen 1968). Eagles that incubate eggs without disruption of nesting activities are more likely to fledge young than are disturbed birds (Fraser 1981). Productivity of nesting eagles is also lower for nests near major roads or recently logged areas than those in undisturbed locations (Anthony and Isaacs 1981). In Washington, unproductive nests averaged 240 feet from permanent human activity while productive nests averaged 390 feet (Grubb 1980).

Effects of human disturbance on foraging, roosting, or perching bald eagles depends on the amount of screening vegetation and type of disturbance. For example, wintering eagles are more tolerant of human disturbance at feeding sites than at loafing or roosting areas (Stalmaster and Newman 1978). Automobile traffic seems to be one of the least disturbing human activities in wintering habitat (Stalmaster 1976), and low (100-300 feet) flying aircraft rarely disturb wintering birds (Krauss 1977). Motor boats, drift boats, and fishermen can be especially disturbing to foraging eagles (Stalmaster 1976).

The U.S. Forest Service (USFS) and USFWS have jointly proposed guidelines to protect eagle nests, perches, and foraging and wintering areas. Adherence to these guidelines is also recommended by the Pacific Northwest Bald Eagle Recovery Team (USFWS 1986). To protect nesting eagles, a primary buffer zone of 330 feet is delineated around the nest site; all human activity within this zone is precluded. An additional secondary zone is also delineated where human activities are restricted during the breeding period. The size of the secondary zone varies depending on screening cover; a radius of 660 feet is recommended in areas with good screening cover and at least 1/2 mile is recommended in open areas (USFWS 1986). Buffer zones for perch sites include 250 to 300 feet in forested areas and up to 1,000 feet in open areas. Additional restrictions apply to picnicking, camping, firearm use, timber harvest, and low flying aircraft. These activities are restricted within 1,320 feet (1/4 mile) of nest sites (USFWS 1986). Such activities should also be regulated up to 1/2 mile from nests and roosts where eagles have line-of-sight vision (USFWS 1986).

3.4 PROJECT AREA USE BY BALD EAGLES

The proposed project area encompasses riverine and palustrine wetlands (Cowardin et al. 1979) in the upper Snake River (USFWS 1988). Several spring fed tributaries occur in this area and support abundant populations of spawning cutthroat trout and a variety of nesting and migratory waterfowl (USFWS 1988). Cutthroat trout and waterfowl represent primary prey items for bald eagles in the area (see below). Trees in the riparian areas and wetlands within the project boundaries provide nest and perch sites for bald eagles.

There are five active bald eagle nest sites in the project area. One is located at the confluence of the Gros Ventre River and the other four sites are between the Wilson and South Park Bridges. Two nesting pairs are located adjacent to the Snake River, and three are on side channels or streams. Nesting pairs outside the project area but nearby include two pairs on Jackson Lake, four pairs between Jackson Lake Dam and Moose, one pair just south of Moose, and several pairs on Buffalo and Gros Ventre Rivers (USFWS 1988). Between 1982 and 1986 the productivity of the six pairs of bald eagles nesting between Moose and South Park, which includes the five nests in the project area, averaged 1.47 young per nest attempt. This productivity rate is considered excellent and exceeds recovery goals.

Of the six quarry sites under consideration, only the Hansen and Walton sites are within critical nesting habitat designated by WGF for bald eagles (WGF 1987a). The Walton and Hansen sites are within 1.0 and 0.4 miles, respectively, of the bald eagle nest at the confluence of the Gros Ventre River.

Aerial surveys performed by USFWS indicate 6 to 15 resident bald eagles in the project area annually. However, as many as 30 eagles have been sighted during winter surveys performed by the National Park Service (Wood 1989, personal communication).

3.5 PROJECT EFFECTS

3.5.1 Effects on Nesting Bald Eagles

The primary effect of the project alternatives on nesting bald eagles would be disturbance from maintenance activities and emergency operations that generally would occur in the early spring, given the overall annual schedule of project actions. Other maintenance activities would be undertaken after the nesting season, or would observe buffer zone guidelines during the nesting season. Spring snow removal and levee patrol are regular ongoing operations that currently occur over the entire levee system. Eagles have nested in the project area without any apparent effects on nesting activities during such operations, and thus continuation of these activities is not expected to affect bald eagle nesting. However, heavy equipment use (numerous dumptrucks, bulldozers, and backhoes) would also continue along the levees during emergency operations. Nesting eagles would likely be disturbed if these activities occurred within 1/2 mile of bald eagle nest sites. Disturbances early in the nesting season are considered more severe than those occurring at later times and could result in reduced productivity and nest site abandonment (Mathisen 1968).

The Corps has agreed to preclude debris clearance activities within the 1/2 mi buffer zone until after the bald eagle nesting season. These activities would therefore not affect bald eagle nesting in the project area. However, both project alternatives, including no action, could lead to emergency operations in the spring that could disturb bald eagles at any of the five nest sites in the project area. Therefore, there would be little difference in effects between alternatives and no change from the existing situation.

Consultation with the U.S. Fish and Wildlife Service and/or the Wyoming Game and Fish Department regarding emergency levee repairs within bald eagle buffer zones has been identified as a continuing concern by the agencies. Normally, activities that may affect a threatened or endangered species require formal consultation with USFWS under Section 7 of the Endangered Species Act of 1973. However, the very nature of emergency levee actions can effectively prevent or limit prior notification or consultation concerning endangered species. Once an imminent levee failure is detected, emergency crews must arrive on-site and begin repair actions as soon as possible, without regard to whether the flood-fight location is within an eagle nest buffer zone. The Corps can and will attempt to notify USFWS and/or WGF in advance of future emergency actions near nest sites to implement expedited, informal consultation. However, given the rapid response time required, it is likely that resource agency staff will not always be available. As provided in Federal regulations on interagency cooperation relative to the Endangered Species Act (50 CFR 402), the Corps is obligated to formally consult with USFWS after an emergency is under control and submit information on the nature of the action, justification for expedited consultation, and any impacts to endangered or threatened species and their habitats.

Quarrying activities required for levee maintenance are not expected to affect nesting bald eagles. With the proposed activity, rock materials will be excavated from the existing Walton quarry. This site has been in use for several years with no apparent effects on the bald eagles nesting at the confluence of the Gros Ventre, about one mile to the north. In addition, the Corps expects to work the quarry primarily in the late summer and fall to avoid the critical bald eagle nesting season. Rock would be stockpiled for use during spring emergency actions. No activities are currently planned for the Hansen quarry, and any proposed use of this site would require a separate assessment.

3.5.2 Effects on Wintering Bald Eagles

No disturbances of wintering birds are anticipated from either project alternative, because no levee maintenance operations or quarry activities would occur during the November through March wintering period. In addition, no significant effects on the food supplies of wintering bald eagles would be expected. Wintering eagles feed on prey, primarily deer and elk carrion and waterfowl (Swenson et al. 1986) that should not be influenced by levee maintenance or quarry operations.

3.5.3 Effects on Foraging Bald Eagles

Emergency repairs of levees under both project alternatives could disturb foraging bald eagles along the river. Bald eagles would probably temporarily avoid these areas as levees are repaired. However, emergency actions at individual locations would be short-term (typically 1/2 to 2 days) and avoidance of these sites by foraging bald eagles would be only temporary in nature. Emergency actions would occur at a limited number of specific sites at any one time, leaving the vast majority of available foraging territory undisturbed.

The Walton quarry is currently in use, with no apparent effects on the local bald eagle population. While it is possible that this area may be avoided during operation by foraging bald eagles, these effects are only temporary in nature, apply to a very small portion of the total foraging area available, and represent no change from existing conditions. Considering both emergency actions and quarry operations, there should be no discernible adverse effects on foraging bald eagles.

3.5.4 Effects of Habitat Alteration on Bald Eagles

None of the project alternatives is expected to directly alter bald eagle foraging or nesting habitat. Potential successional changes of existing palustrine forest behind the levees due to flood protection would likely result in the loss of some of the large cottonwoods that provide nest and perch sites for bald eagles. However, by the time this occurs, it is likely that there would be large spruce and lodgepole pine in the project area. Both of these species are used by nesting and perching bald eagles in the Yellowstone Ecosystem (Swenson et al. 1986). Consequently, neither of the project alternatives would be expected to directly reduce bald eagle nesting or perching habitat.

Continued use of the Walton quarry would also not be expected to alter bald eagle foraging or nesting habitat.

However, continued development due to flood protection of land adjacent to the levees might be an indirect effect of the project that could cause the loss of bald eagle nesting, perching or roosting habitat. While this type of indirect effect has no doubt occurred in the past (at least three bald eagles have relocated their nests since 1987 in apparent response to housing development, and a nest in what is now the Solitude Subdivision was abandoned in 1981), it is questionable to what extent this will occur in the future near bald eagle nests. Most of the floodplain development to date has occurred behind the Federal levees, particularly on the right bank north of Wilson, which provide protection from 100-year floods. The nonfederal levees generally protect against only 10-year or annual floods, and therefore do not provide a significant stimulus to floodplain development. Consequently, continued levee maintenance would likely result in little induced floodplain development near eagle nests and there would likely be little difference between alternatives in this regard. Considering that either alternative would represent continuation of the existing level of flood protection, the proposed action would have no adverse incremental effect on bald eagle habitat.

3.6 REFERENCES

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4.0 PEREGRINE FALCON DISTRIBUTION AND HABITAT REQUIREMENTS

4.1 DISTRIBUTION

Historically about 180 pairs of peregrine falcons nested in the Rocky Mountain/Southwest Region. However, fewer than 30 pair (most on public lands) exist today USFWS 1977). Peregrine falcons in the Tri-state (Wyoming, Montana, and Idaho) area were never considered abundant. Peregrine falcons were thought to be a rare summer resident in Wyoming (Knight 1902). There are historic reports of peregrine falcon nest sites in Yellowstone National Park but nesting was probably rare (Barley 1930, Kemsies 1950).

Since 1980, a total of 184 peregrine falcons have been reintroduced into the Tri-state region by the Peregrine Falcon Recovery Team (USFWS 1988). Two of the Wyoming hack sites are located near the project area, one in the National Elk Refuge and one northwest of Wilson Bridge. Between 1981 and 1988, a total of 75 peregrines have been released from these two sites (USFWS 1989). In 1989, 30 peregrine falcons were released to hack sites in Wyoming, 23 of which successfully fledged. In addition, 11 young were produced at 12 wild eyries in Wyoming in 1989 (Starkey 1990, personal communication). The reintroduction program is scheduled to continue through 1995 (USFWS 1988).

Little is known of the wintering movements of peregrine falcons and information on wintering requirements has been identified as a Recovery Team goal. Peregrine falcons have occasionally been sighted in the recovery region during the winter. Peregrine falcons have been reported wintering near large rivers or waterfowl refuges in Utah and Colorado (Enderson 1965).

4.2 HABITAT REQUIREMENTS

4.2.1 Forage Habitat

Peregrine falcons will travel up to 17 miles to hunt. Hunting sites are usually near marshes, lakes, and riverbottoms; although croplands and meadows are also used (Porter and White 1973). Peregrine falcons feed almost exclusively on birds that they actively capture, including blackbirds, jays, doves, shorebirds, and waterfowl (Porter and White 1973). Abundance and diversity of prey is generally a limiting factor governing selection of nest sites as well.

4.2.2 Nesting Habitat

In the Rocky Mountain and southwest region, peregrine falcons nest mainly along cliffs and river gorges. Active eyries are usually on cliffs greater than 200 feet in height and along open ledges with southern exposure. Most nests occur near scrub-oak and pinyon-juniper communities (USFWS 1977).

4.3 RESPONSE TO DISTURBANCE

Nesting peregrine falcons are most susceptible to human disturbance when it occurs early in the nest season during courtship and egg-laying (Nelson 1970, Fyfe and Prescott 1973). Activities such as rock climbing, low flying aircraft, hiking, and sudden loud noises are particularly disturbing to nesting birds and may lower nesting productivity (Fyfe and Oldendorff 1976). As with most raptors, tolerance to disturbance varies among individuals and includes extreme cases of captively bred and reintroduced peregrines nesting in urban environments.

Guidelines for protection of falcon nest sites include prohibition of land use activities that alter or eliminate characteristics of hunting habitat and prey within 10 miles of eyries, and nesting habitat within 1 mile of a nest cliff. Disturbances and human activities are also restricted from 1 February through 1 August within 1/2 mile of a nest cliff (USFWS 1977).

4.4 PROJECT AREA USE BY PEREGRINE FALCONS

The proposed project area encompasses riverine and palustrine wetlands (Cowardin et al. 1979) in the upper Snake River (USFWS 1988), and is potential foraging habitat for peregrines. Several spring fed tributaries occur in this area and support abundant populations, small birds and nesting and migratory waterfowl which are prey for peregrine falcons. A total of three to four subadults and adults have been observed foraging between the Wilson and South Park Bridges during the last six years (USFWS 1988).

The project area is close to the peregrine hack sites located northwest of Wilson and at the National Elk Refuge, but there are no known natural eyries nearby. Peregrines released from the hack sites probably forage in the project area. Use of the project area by nesting peregrines is unlikely due to lack of suitable cliffs.

4.5 PROJECT EFFECTS ON PEREGRINE FALCONS

The project area is well within the 10 mile protection zone for the peregrine hack sites located northwest of Wilson and in the National Elk Refuge. However, none of the levee maintenance activities would be expected to alter or eliminate hunting habitat or prey for peregrine falcons released from these hack sites. Emergency actions at individual locations or quarry activities at the Walton site may result

in short-term avoidance of individual areas by peregrine falcons, but would only be temporary and highly localized in nature. Consequently, maintenance activities under either of the project alternatives are not expected to affect nesting or foraging peregrines.

Continued vegetation successional change and land development due to the flood protection offered by the project might reduce the amount of forage habitat available to peregrine falcons and could conceivably affect their recovery in this area in the future. However, most of the flood plain development to date has occurred behind Federal levees, particularly on the right bank of Wilson, which provide protection from 100-year floods. Non-federal levees generally only protect against 10-year or annual floods and therefore do not provide a significant stimulus to flood plain development. Consequently, continued levee maintenance would likely result in little induced flood plain development in the project area. There would likely be little difference between alternatives in this regard, and no measurable effects on peregrine falcons. Similarly, neither project alternative would represent any change to existing successional patterns. Therefore, the proposed action would have no incremental effects on peregrine falcons.

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5.0 WHOOPING CRANE DISTRIBUTION AND HABITAT REQUIREMENTS

5.1 DISTRIBUTION

The whooping crane is one of the rarest birds in North America. In the mid-1800s, the estimated maximum population of whooping cranes in North America was about 1,300 birds (Allen 1952). By 1937 only two small breeding populations remained, the migratory Wood Buffalo-Aransas population and a sedentary population in southwestern Louisiana (U.S. Fish and Wildlife Service [USFWS] 1980). The small population in Louisiana was extirpated during a storm in 1940. Presently, only about 110 whooping cranes exist, and most of these winter at Aransas National Wildlife Refuge (ANWR) in Texas and breed at Wood Buffalo Nation Park (WBNP) near Alberta (USFWS 1980, USFWS 1988).

The migratory route of whooping cranes includes a narrow corridor between WBNP and ANWR. This route includes northeastern Alberta, southwestern Saskatchewan, northeastern Montana, western and central North and South Dakota, central Nebraska, Kansas, Oklahoma, and east-central Texas (USFWS 1980).

In 1976, a cross-fostering program for whooping cranes was begun. Cross-fostering involves using sandhill cranes from Grays Lake National Wildlife Refuge in Idaho as surrogate parents for eggs taken from whooping cranes at WBNP and Pawtuxent Research Center. Cross-fostered whooping cranes from Grays Lake Refuge have occupied Wyoming since 1977 (USFWS 1988). Since the establishment of this program, approximately 30 percent of cross-fostered cranes annually summer in Wyoming (USFWS 1988). During the summer of 1985, for example, 26-31 cross-fostered cranes were released in Wyoming and 10 remained (USFWS 1988).

5.2 HABITAT REQUIREMENTS

5.2.1 Nesting Habitat

Most whooping cranes nest at WBNP. The nesting area is characterized by low relief and numerous potholes separated by narrow ridges. The ridges support an overstory of black spruce (Picea mariana), tamarack (Lavix laricina), and willow (Salix sp). The most dominant emergent in the potholes is bulrush (Scirpus validus) and this species is most commonly used by nesting whooping cranes. Nests are located in rushes or sedges in marshes, sloughs, or along lake margins (USFWS 1980).

5.2.2 Foraging Habitat

Most whooping cranes winter at ANWR. This area is comprised of salt marshes, flats, and adjacent islands. Important prey during the winter include blue crabs (Callinectes sapidus) and clams (USFWS 1980). During the summer, insects and the tubers of rushes (Juncus sp.) and timothy (Phleum sp.) are the major components of whooping crane diets (Lockman 1989, personal communication).

5.3 PROJECT AREA USE BY WHOOPING CRANES

In the upper Snake River drainage, whooping crane habitat requirements are similar to those of sandhill cranes (Wood 1989, personal communication). Important habitats in and near the project area for whooping cranes include: 1) seasonal and permanent wetlands; 2) permanent and semi-permanent wetlands including tall emergents, open water marshes, riverine beaver ponds, oxbows and sandbars; and 3) upland deciduous and coniferous edges, sage-grass fields, upland gross-forb meadows, irrigated hayfields, and grainfields (Lockman et al. 1985).

Use of the project area by whooping cranes has been sporadic, with a few incidental sightings reported during spring migration and one yearling crane observed during the summer of 1987 near Spring Creek and the Snake River (Lockman et al. 1985, USFWS 1988). Most incidental sightings were of birds on wet meadows and fields adjacent to the river (Oakleaf 1989, personal communication). In addition, whooping cranes have been observed along the Gros Ventre River about 5 miles from the project area (Wood 1989, personal communication).

5.4 POTENTIAL PROJECT EFFECTS

Human presence and equipment noise from levee maintenance and quarry operations might disturb cranes if they are in the project area during April and May. Emergency levee maintenance activities near habitats preferred by whooping cranes would probably temporarily preclude their use of these areas. However, emergency actions are short-term and any affects on whooping cranes would be only temporary in nature.

Continued habitat successional change and land development due to the flood protection offered by the project might reduce the amount of nesting habitat potentially available to the whooping crane. However, most of the flood plain protection development to date has occurred behind the Federal levees, particularly on the right bank north of Wilson, which provide protection from 100-year floods. The non-federal levees generally protect against only 10-year or annual floods, and therefore do not provide a significant stimulus to flood plain development. Consequently, continued levee maintenance would likely result in little induced flood plain development in the project area and there would be little difference between alternatives in this regard. Similarly, neither project alternative would represent any change to existing successional patterns. Therefore, the proposed action would have no incremental effects on whooping cranes.

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6.0 GRIZZLY BEAR DISTRIBUTION AND HABITAT REQUIREMENTS

6.1 DISTRIBUTION

The distribution of grizzly bears in North America once ranged from Ontario west to the California coast and extended south into Texas and Mexico (U.S. Fish and Wildlife Service [USFWS] 1979). Grizzly bears occupied most of western North America prior to westward expansion and white settlement. However, between 1800 and 1975 the population of grizzly bears declined from more than 100,000 to less than 1,000 (USFWS 1979). Conflicts between bears and livestock owners and habitat destruction accounted for most of this decline. Today, only six areas support self-sustaining or remnant grizzly bear populations and these areas lie within the Pacific Northwest and Rocky Mountain states (USFWS 1979). The Yellowstone Grizzly Bear Ecosystem (YGBE) presently supports from 200-350 grizzlies in an area that includes Yellowstone and Grand Teton National Parks, J.D. Rockefeller Memorial Parkway, and portions of the Shoshone, Bridger-Teton, Targhee, Gallatin and Custer National Forests.

6.2 HABITAT REQUIREMENTS

Grizzly bears are opportunistic feeders that forage on a variety of small mammals, ungulates, birds, and carrion. The roots, bulbs, and tubers of various plants, as well as fungi and berries are also consumed (Homer 1974, Pearson 1975, Singer 1978). In areas with abundant salmon runs, fish are an important part of the grizzly bear's diet (Cole 1972, Homer et al. 1977).

In general, grizzly bear habitat in YGBE consists of a mosaic of fertile grasslands, stream bottomlands, ridgetops, talus slopes, swamps, and conifer forests (Mealey 1979). Most feeding by grizzly bears occurs in forested areas with trees over 3-m tall (Blanchard 1978).

The home range of grizzly bears encompasses a variety of habitat types necessary to supply adequate food, cover, and water. Home ranges of adult grizzlies differ between sexes and age classes. Male grizzlies generally have home ranges two to four times larger than females (Kemp 1972, Craighead 1976), while female home ranges tend to be concentrated when cubs are present and enlarged when cubs become yearlings (Kemp 1972, Pearson 1975, Servheen and Lee 1979). Subadults are believed to disperse from the natal home range and travel over extensive areas in avoidance of established adults (USFWS 1979). Consequently, subadults may be more vulnerable to human conflict and may experience less than optimal habitat conditions (USFWS 1979).

Home ranges also vary in accordance with food availability, weather, and interactions with other bears. Moreover, individual home ranges may change seasonally or annually depending on these conditions (USFWS 1979).

Average home range in the YGBE was 179 mi^2 for males and 105 mi^2 for females with extremes of 3 mi^2 and 672 mi^2 also reported (USFWS 1979). Extension of home ranges outside park boundaries are also known and seem to be related to presence of garbage dumps near the park (Craighead 1976, 1980).

6.3 PROJECT AREA USE BY GRIZZLY BEARS

The proposed project area encompasses riverine and palustrine wetlands (Cowardin et al. 1979) in the upper Snake River (USFWS 1988). Several spring fed tributaries occur in this area and support abundant populations of spawning cutthroat trout and a variety of nesting and migratory waterfowl that could be prey for the grizzly bear. However, no sightings of grizzly bears have been reported for the project area (Wood 1989, personal communication; Oakleaf 1989, personal communication; USFWS 1988). Given the large home range of grizzlies and the tendency for subadults to disperse, it is conceivable that grizzlies could wander into the project area. However, increasing development outside national park boundaries is likely to restrict grizzly movements to undisturbed areas within the parks.

6.4 POTENTIAL PROJECT EFFECTS

Since no grizzly bears have been observed in the project area, the probability of disturbance from any levee maintenance activity is very low, and there should be no project effect on grizzly bears. However, human conflicts might occur if grizzly bears wander into the project area during levee maintenance activities or quarry operations.

Prior to initiating the levee maintenance program, the Corps will, in consultation with the USFWS, develop procedures to minimize conflicts with grizzly bears if one should be sighted during emergency or routine operations.

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