US Army Corps of Engineers ®
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JACKSON HOLE FLOOD PROTECTION PROJECT OPERATIONS AND MAINTENANCE

JACKSON HOLE LEVEE PROJECT

JACKSON HOLE, WYOMING

PM-EC-2017-0009BA

Biological Assessment

for

Trust Resources

Under the Jurisdiction of
the
U.S. Fish and Wildlife Service

ADMINISTRATIVE RECORD – DO NOT DESTROY

U.S. Army Corps of Engineers
Walla Walla District
Environmental Compliance Section

March 2018

SUMMARY

The U.S. Army Corps of Engineers, Walla Walla District (Corps) is supplementing the National Environmental Policy Act (NEPA) documentation for the operation and maintenance (O&M) program for the Federal and non-Federal levees that make up the Jackson Hole Flood Protection Project (JHFPP) along the Snake and Gros Ventre Rivers near the town of Jackson in the northwest corner of Wyoming.

The Corps has maintenance responsibility for the operation and management of 28 levees, 48 access road segments, and five stockpile sites in the JHFPP. While managed by the Corps, the levees have a mixture of Federal, State, County, and private ownership, and original construction. The levee system is approximately 34 linear miles: 31 miles of levees on the Snake River and three miles on the Gros Ventre River.

O&M actions that will take place in the JHFPP are: spring snow removal, spring levee patrols, emergency actions (flood fighting), rock and fill material stockpiling, levee rehabilitation, debris clearance, culvert cleaning and repair, vegetation removal, and access road maintenance.

Best management practices for this action have been evaluated and include, but are not limited to, the following environmental considerations:

(1) Maintain a buffer distance around eagle nests of 330 feet, non-line of sight and 660 feet line of sight, during eagle nesting season (February 1 through August 15).

(2) If work is to be conducted during the migratory bird nesting timeframe (April 1 through August 1), an avian biologist will survey for active nests within the project area, and establish appropriate buffers.

(3) In the unlikely event that a wolverine or lynx enters the project area, personnel will maintain a 100-yard buffer between the animal and the operations.

The Corps concludes that the proposed actions “may affect, but are not likely to adversely affect” yellow-billed cuckoo in the project area. The Corps also concludes that the project would have “no effect” on Canada lynx, wolverine, or whitebark pine. In addition, the Corps has also determined that the proposed project will result in no disturbance or take under the Bald and Golden Eagle Protection Act (BGEPA).

If additional information regarding this document is required, please contact Ben Morris, Biologist in the Environmental Compliance Section of the U.S. Army Corps of Engineers, Walla Walla District, at (509) 527-7294, or by email at Benjamin.W.Morris@usace.army.mil. Other correspondence can be mailed to:

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Acronym Glossary

BA	Biological Assessment
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practice
CFR	Code of Federal Regulations
CFS	Cubic feet per second
Corps	Walla Walla District, U.S. Army Corps of Engineers
DPS	Distinct Population Segment
ESA	Endangered Species Act of 1973, as amended
FR	Federal Register
FWCA	Fish and Wildlife Coordination Act
MBTA	Migratory Bird Treaty Act
NRM	Northern Rocky Mountains
PL	Public Law
RM	River Mile
USFWS	U.S. Fish and Wildlife Service
WTGMA	Wolf Trophy Game Management Area
WYNDD	Wyoming Natural Diversity Database

1 Federal Action

1.1 Introduction

The Walla Walla District of the U.S. Army Corps of Engineers (Corps) is supplementing National Environmental Policy Act (NEPA) documentation for the operation and maintenance (O&M) program for the Federal and non-Federal levees that make up the Jackson Hole Flood Protection Project (JHFPP) along the Snake and Gros Ventre Rivers near the town of Jackson in the northwest corner of Wyoming (Figure 1). Included in this new action is an updated Biological Assessment of the current and proposed O&M actions and associated potential environmental effects that may not have been adequately addressed in the April 1990 *Jackson Hole, Wyoming Flood Protection Project O&M Decision Document and Environmental Impact Statement* (1990 O&M Decision Document/EIS) (Corps, 1990). This BA is tiered to, and incorporates by reference, the 1990 O&M Decision Document/EIS and associated BA. The Corps is proposing to continue to operate and maintain the JHFPP consistent with its authorized purposes, while minimizing adverse effects to the environment.

1.2 Prior Consultations

- May 2016, U.S. Fish and Wildlife Service, Endangered Species Act Section 7 Informal Consultation. Vegetation spraying and removal. U.S. Fish and Wildlife Service USFWS Reference Number 06E13000-2016-1-0189.

- August 2015, U.S. Fish and Wildlife Service, Endangered Species Act Section 7 Informal Consultation. Levee repair and vegetation removal. U.S. Fish and Wildlife Service USFWS Reference Number 06E13000-2015-E-0175.

- 1989, Jackson Hole Flood Protection Project Draft Biological Assessment, – U.S. Fish and Wildlife Service USFWS Reference Number, W.06 Corps of Engineers (Snake river Levee project); Corps Reference Number Jackson Hole Flood Protection Project O&M Decision Document EIS Appendix A, 1989.

1.3 Proposed Action

1.3.1 Project Location

The Jackson Hole Project is located near Jackson, Wyoming in Teton County, Wyoming. O&M activities would take place along the entire length of the Jackson Hole Project, located along the Snake and Gros Ventre Rivers where the U.S. Army Corps of Engineers, Walla Walla District (Corps) has maintenance responsibility for 34 miles of levees (Figure 1).

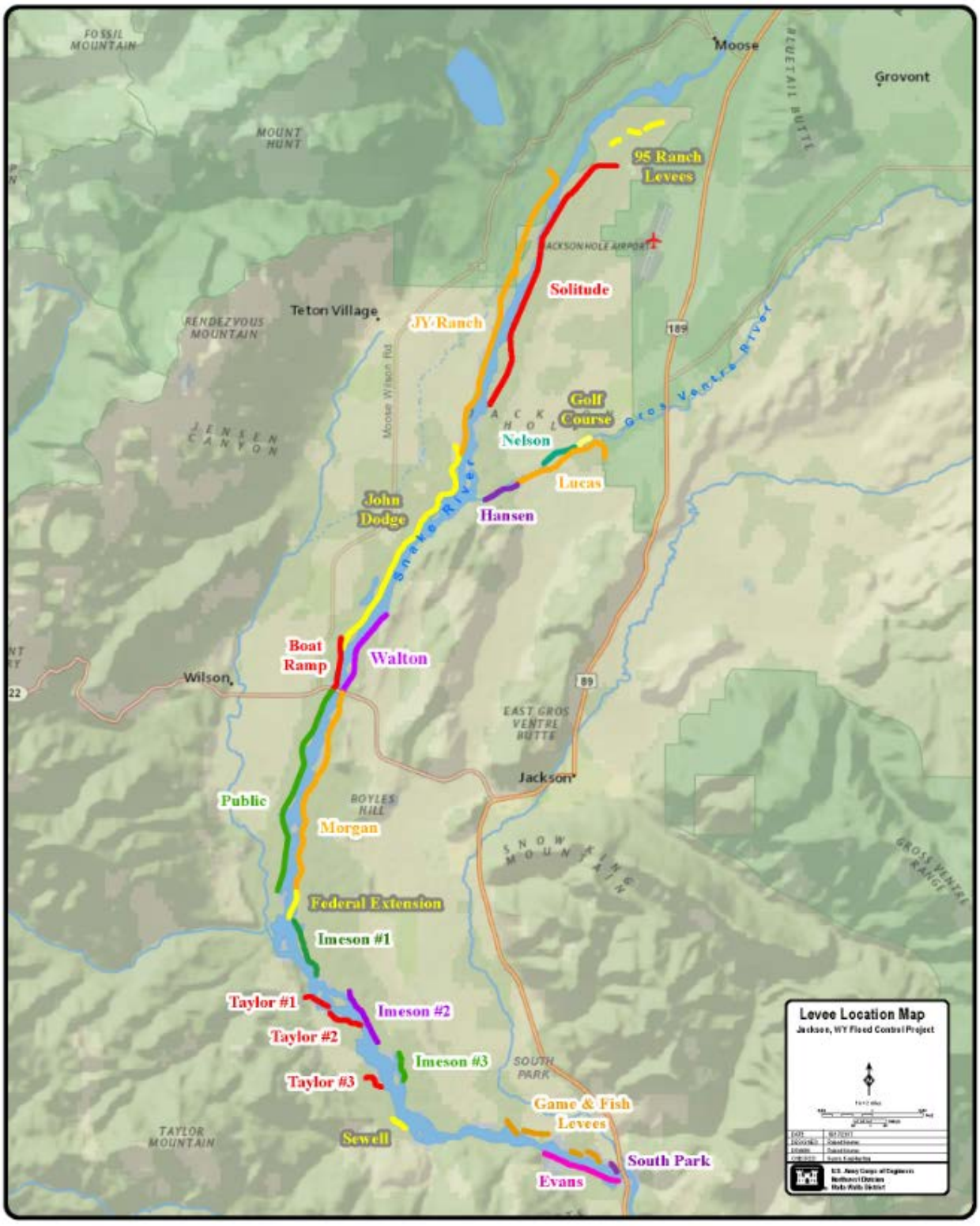

Figure 1. Map Showing the General Location of the Jackson Hole Levees, Jackson, Wyoming

Jackson Hole is a large, enclosed valley up to 12 miles wide and extending approximately 60 miles from north to south (USFS 1979). This valley is bordered to the north by the highlands of the Yellowstone plateau and to the west by the Teton Mountains, which rise to elevations of over 13,000 feet. The remaining mountain ranges that enclose the Jackson Hole valley are the Mount Leidy Highlands to the east and the Hoback Mountains and Snake River Range to the south.

The headwaters of the Snake River are in Yellowstone National Park about 80 miles north of Jackson. From the headwaters area, the Snake River flows south into Jackson Lake, within Grand Teton National Park, and continues south through Jackson Hole before turning west into Idaho. The project area includes about 25 miles of the Snake River from below the town of Moose to the U.S. Highway 26/89/191 bridge in South Park. The Snake River in this reach has a relatively wide, braided channel. The project area also includes the lower 3 miles of the Gros Ventre River. The Gros Ventre River is a major tributary, entering the Snake River from the east about 10 miles downstream from Moose. The land adjacent to both rivers in this reach is used primarily for ranching and rural residential home sites.

1.3.2 Action Description

The JHFPP currently consists of 28 levees, 48 access road segments, and five stockpile sites. Seven of the levees were formerly known as the “Federal Project” (i.e. Federal levees). The remaining 21 levees were constructed by Teton County, State, and Federal agencies, and individual landowners (i.e. non-Federal levees). The levee system is comprised of about 34 miles of Federal and non-Federal levees located adjacent to both the Snake and Gros Ventre Rivers (Figure 1). The levees are located along one or both banks of the rivers and provide a discontinuous system of levees. There are about 23 linear miles of Federal levees (7 levees) and 8 miles of non-Federal levees (17 levees) along the Snake River and about 3 linear miles (four levees) of non-Federal levees along the Gros Ventre River.

Teton County acquired perpetual easements for all of the Federal levees during construction of the original Federal project, and was granted access to the levees by the most direct or expeditious route across adjoining private property. The levee easement is about 150 feet wide - generally 50 feet wide on the land-side of the levee and 100 feet wide on the water side. Both measurements are from the center of the levee crown. Teton County has also acquired easements with appurtenant access for the non-Federal levees, but the easement widths are not uniform. There are also easements across adjacent private and public property to allow maintenance vehicle access to the levees. The Corps performs maintenance on about 27 miles of access road as part of the JHFPP. All of the O&M activities take place within the levee and access road easements (Figure 2a, 2b).

Both the Corps and Teton County have obligations that are described in a Local Cooperation Agreement (LCA) dated September 1990. The Corps has the primary responsibility for O&M of the levee system. Teton County is the non-Federal sponsor

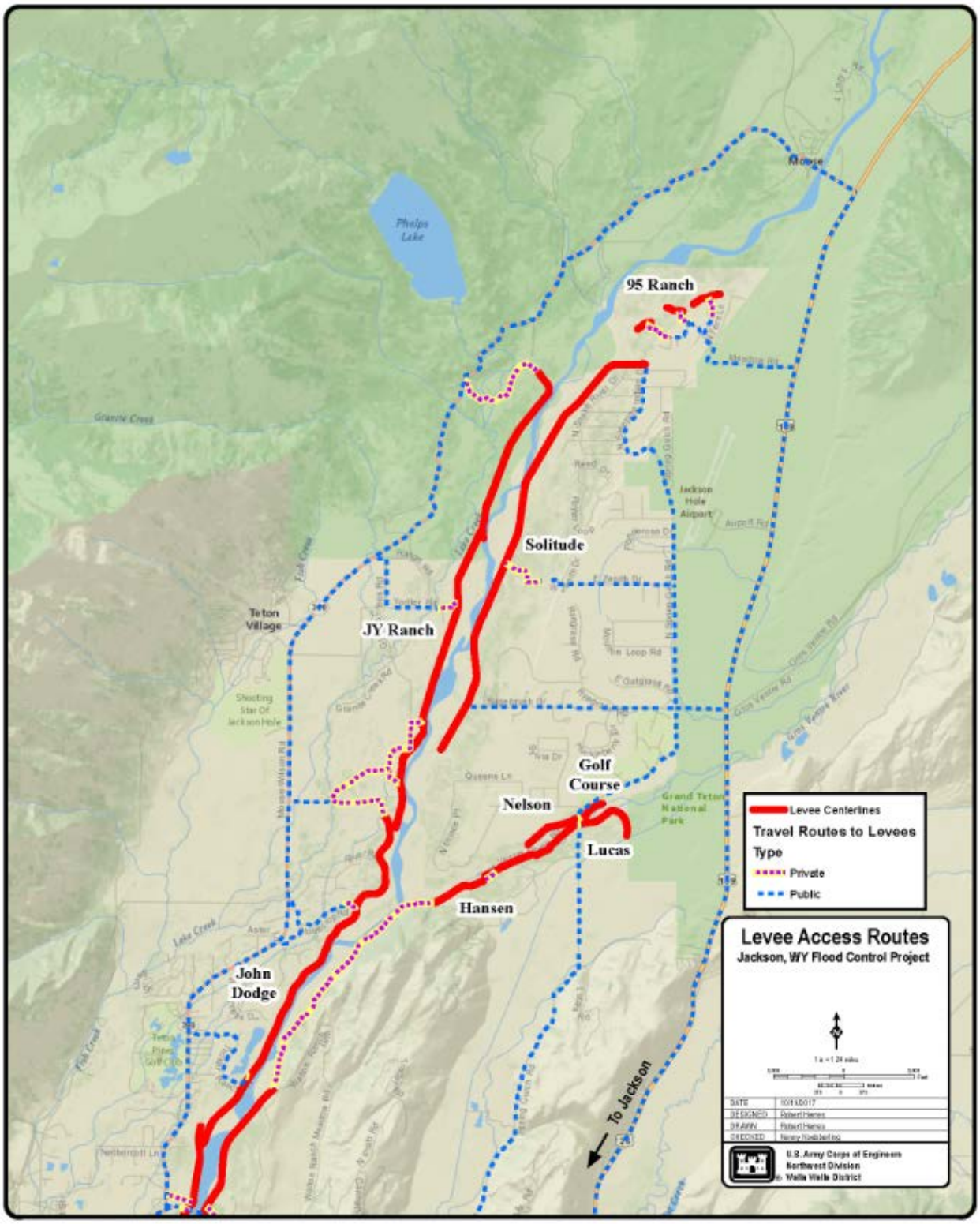

Figure 2a. Map Showing the General Location of Levee Access Roads for the Upper end of Jackson Hole Levees, Jackson Wyoming

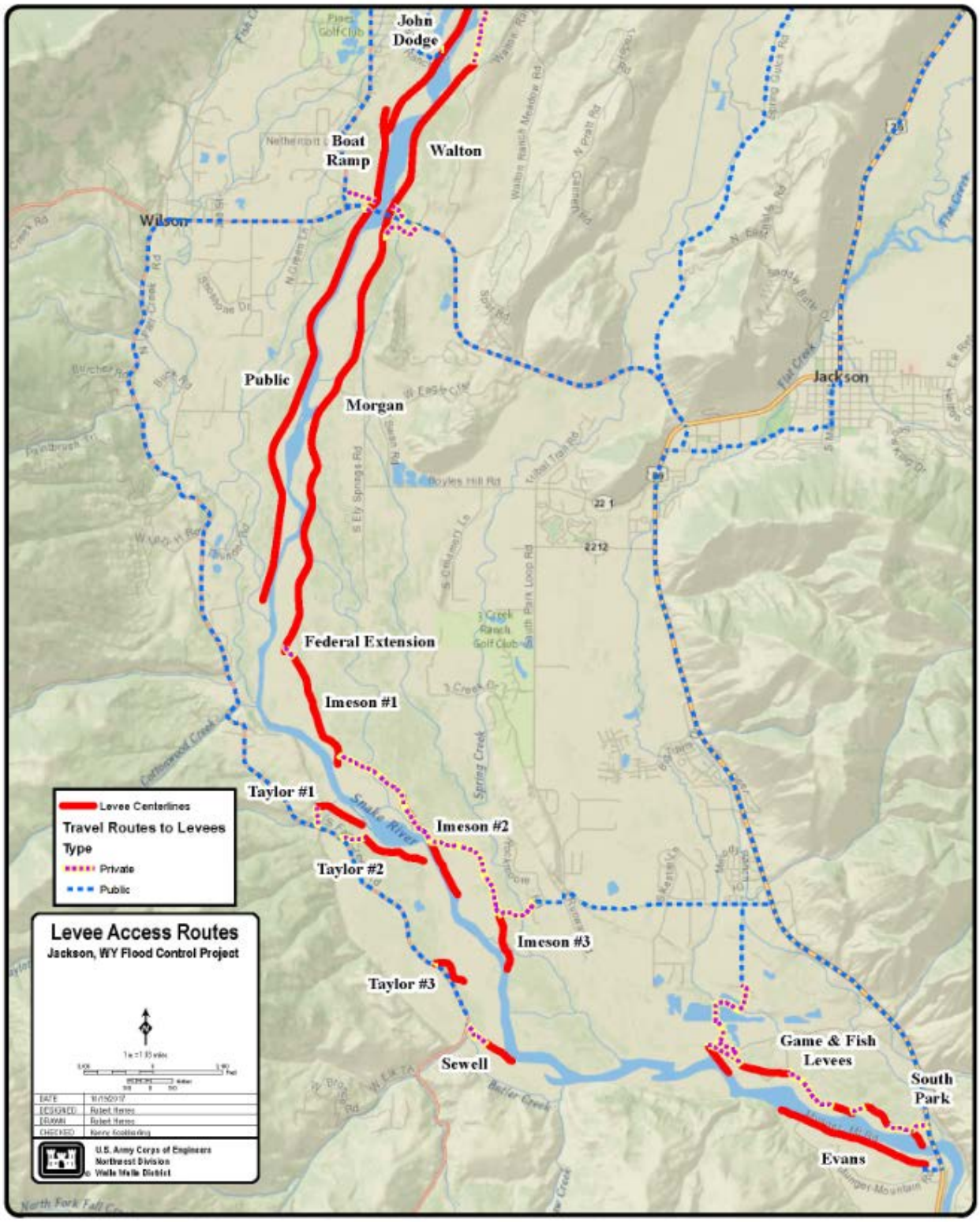

Figure 2b. Map Showing the General Location of Levee Access Roads for the Lower End Jackson Hole Levees, Jackson Wyoming

for the project and contributes annual funding, performs some O&M activities at the direction of the Corps, and provides real estate-related items such as lands, easements, and rights of way.

The Corps is also evaluating changes that have occurred in the O&M of the JHFPP over time and potential environmental effects associated with those changes, and current/proposed O&M practices that were not adequately evaluated in the 1990 O&M Decision Document/EIS. While some activities will be seasonally dependent, collectively they will be occurring year round.

One of the impacts not addressed in the 1990 O&M Decision Document/EIS document, but now covered in this BA are the effects to birds. While the O&M Decision Document/EIS did address bald eagle nesting, it did not address impacts to migratory birds. Avian impacts are common to several actions. Restrictions have been identified to avoid and minimize avian impacts. The main focus of avoidance and minimization are time of year restrictions, area avoidance, and documentation of the presence of absence of nesting birds and subsequent mitigation activities. The efforts to minimize impacts will be covered in greater detail in the descriptions of the individual actions.

Some of the O&M actions may have an adverse effect on wetlands. These effects were not adequately addressed in the O&M Decision Document/EIS. The O&M Decision Document/EIS did addressed the effect levee construction had on wetlands, but did not adequately address the effects of the O&M actions. Proposed actions such as removal of woody vegetation from the 15-foot clear zone and extension of the turnaround areas have the potential to affect wetlands. These affects are covered in greater detail in the description of the individual actions.

1.3.2.1 Spring snow removal

Removal of snow in the spring from the access roads and top (driving surface) of the levees is done as needed, about once every three years. This would typically occur between March 15 and March 30, but exact scheduling would be dependent upon prevailing weather conditions. Standard snow removal equipment is used to plow access roads and the tops of the levees. This is usually performed using a road grader. This activity is needed to provide vehicle access to the levee system for patrols and to allow the levees to dry so that heavy equipment can be accommodated and not damage the levees during flood-fighting activities. This usually takes about a week to perform.

1.3.2.2. Spring levee patrols

Patrols of the levee system are made during daylight hours for the duration of the flood watch period. Patrols consist of two persons driving on the levee crown and looking for signs of damage or failure. The flood watch period begins when water levels rise in the spring and ends when flood flows recede. The frequency of the patrols depends on the river flow. Patrols are made on a daily basis when flows exceed 10,000 cubic feet per second (cfs) and increase to twice daily when flows exceed 15,000 cfs.

1.3.2.3. Emergency actions (Flood fighting)

Flood-fighting and emergency repairs are performed as needed at the problem/damaged sites during the spring peak flows, usually between May 1 and July 10. These efforts typically involve placement of additional riprap on the levee surface and/or reconstruction of the levee core and riprap. Individual flood fights usually require one-half to two days of activity at each site. Equipment requirements for this effort can include 8-10 dump trucks, a bulldozer, an excavator, wheeled vehicles for supervisory personnel, and a commensurate work crew at one site. Repairs may occur at multiple sites during a busy flood season. Emergency repairs at more than one site at a time would require some additional resources, but not necessarily multiple full crews with equipment.

1.3.2.4. Rock and fill material stockpiling

Riprap and backfill material for levee repairs are transported from an off-site commercial quarry to the designated stockpile sites or directly to the repair sites on the levees. Because the local rock is deficient, contractors haul in suitable rock from sources up to 200 miles away. Rock is typically hauled in dump trucks with pup trailers or in side-dump trucks. During rock hauling operations, the Corps may haul about 10 loads per day of large rock (e.g. riprap) and about 20 loads per day of smaller rock (e.g. rockfill). The Corps' levee repair contractor may make about 15 trips per day to haul material from the stockpile sites to the work sites. Hauling operations from the stockpiles typically take place from about mid-May when emergency repairs begin during spring runoff. Hauling rock from the quarries or rock sources to the stockpile sites typically takes place from mid-August to the end of the regular work season in November or December, depending on the weather.

In the future, the Corps may obtain some of its rockfill (gravel) from the environmental restoration activities the Corps proposed in its *Jackson Hole, Wyoming Environmental Restoration Feasibility Study and Environmental Assessment* (Corps et al. 2000). Some of the restoration features the Corps is proposing would involve removing gravel from the river, possibly reusing some of the gravel, and using upland disposal for the remainder.

The majority of the rockfill is stored at one of the designated stockpile sites. At certain times of the year rockfill may be preemptively stored on the levees themselves. Storage on the levees is done to preposition piles for rapid response during high flow events or prior to construction activities. If gravel is stored outside on the levee footprint, silt curtains will be placed around it to ensure that runoff from weather events is kept out of the river.

There are five designated stockpile sites used to store and supply gravel to the levees (Figure 3). Four are adjacent or on the levees, and one is at the Wyoming Department of Transportation site adjacent to highway 390 about four miles north of Wilson and one mile west of the Snake River.

The current Walton site is in the planning stages to be moved closer to the Wilson Bridge downstream from its current location. The land under the current site has been sold and the county no longer has an access easement to use the site. Teton County plans to develop the new stockpile site, designated the BLM-Walton stockpile site, to replace the Walton site after the 2017 construction season. The county has applied for a stockpile facility right-of-way from the Bureau of Land Management on the left bank of the Snake River about two miles downstream of the current Walton site. The site is a previously disturbed area on the landward side of the levees and near existing road access. The new site should be ready for use in 2018.

Each stockpile site is typically one to two acres of previously disturbed area on the landward side of the levees. Maintenance activities on the sites can include grading, replacing gravel on the driving surfaces, dust control, and weed control.

Although the Corps does not have any plans at this time to develop additional stockpile sites, beyond the five already identified, the Corps may decide in the future that additional sites are needed. If the Corps was to develop new sites, they would likely follow criteria similar to that used to establish the current sites. The Corps would look for previously disturbed locations on the landward side of the levees. The sites would need to be several acres in size to allow sufficient room to store rock material and possible debris and to allow large vehicles to maneuver. The sites would need to have sufficient access or potential access to the major highways and the levee system. If the sites are outside of the existing levee easements, the Corps would request Teton County to acquire the use of the additional land. Site development could include vegetation/tree removal, soil disturbance for site clearing and leveling, and gravel placement on driving surfaces. It may also include establishing an access road to connect to the levee or the highways. Access road development could also include vegetation/tree removal, grading, and gravel placement. If wetlands could not be avoided, the Corps would minimize the wetland disturbance and perform any required mitigation.

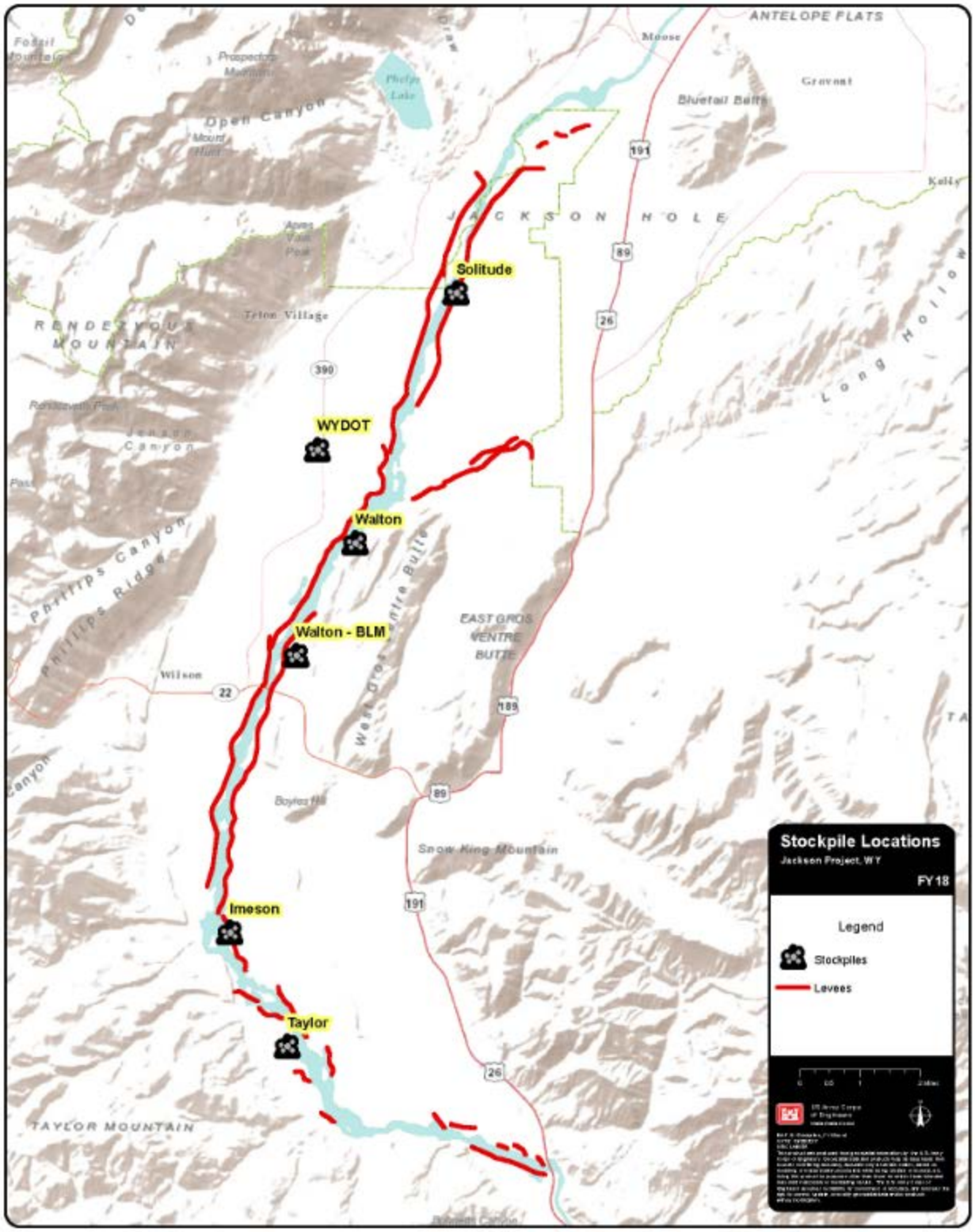

Figure 3. Rock stockpile sites. (Walton site will be closed and replaced by Walton-BLM)

1.3.2.5. Levee rehabilitation

Levee rehabilitation takes place later in the year (summer/fall) after flows have decreased, usually between August 1 and November or December depending on when snow fall impedes access to the area. Each year the Corps and Teton County perform a levee inspection to identify damaged sites that need rehabilitation. Rehabilitation includes selective reinforcement or reconstruction of levee sections which have been damaged by flooding or appear susceptible to future failure. The work can include excavating the toe of the levee and replacing rock, replacing levee rockfill, and replacing rock armoring on the surface of the levee. The rock materials are placed using an excavator and are not end-dumped into the work location. The number of sites varies each year depending on the damage from that year's spring runoff. Levee rehabilitation also includes proactive reconstruction of levee segments to the original standard specifications and on the correct alignment. This reconstruction is typically performed on several levees or levee segments per year, depending on need and suitable weather conditions. The Corps rebuilds about four miles of levee per year. This work typically involves several end-dump or side-dump trucks, a bulldozer, and a tracked excavator equipped with a thumb. Depending on the height of the levee, a bench may need to be cut in the existing levee to permit the tracked excavator to reach down to the bottom of the levee to replace the levee toe.

In the future the Corps may place in-water structures to protect the levees from damage such as erosion or undercutting of the toe (Figure 4). The Corps is proposing to construct several rock barbs or weirs along the toe upstream of the damaged area to encourage the flow to remain in the river channel and to reduce water velocities. The Corps has identified a need to add these structures to protect at least the John Dodge levee. A gravel bar in the Snake River has been directing river flows towards the levee and undercutting the toe.

These structures would not change the level of flood risk management provided by the levees. An example of such structures would be one or more rock barbs or weirs along the toe of the levee upstream of the area to be protected. These barbs or weirs would help push the water back towards the center of the river and away from the levee. This would encourage the flow to remain in the river channel and reduce water velocities near the levee.

The structures could be about 20 to 40 feet long and angled upriver from the levees. They would likely be constructed by using an excavator to prepare the river bed and place large rock. Any structure added to protect the levees would need regular maintenance such as replacing rock or restoring the alignment. This maintenance would be performed in a similar manner as the levee rehabilitation.

The Corps schedules routine levee rehabilitation work to avoid adversely affecting nesting bald eagles, which are known to nest in the areas large trees. The Corps typically obtains the locations of active bald eagle nests from the Wyoming Game and Fish Department in late-March and May. When performing levee rehabilitation within

the nesting season of February 1 – August 15, the Corps refrains from working within applicable buffer zones. These zones are 330 feet from the nest when the nest is not visible from the work area and 660 feet from the nest when the nest is visible from the work area.

In future years, the Corps may start work as early as July 1 instead of August 1. If the work has the potential to disturb or destroy nests or nestlings of birds protected by the MBTA, the Corps would perform a nest survey of the work area and leave a buffer zone around any active nests until the birds have fledged. If the Corps decided to start work on or after August 1, no nest surveys would be needed as data from recent years has shown the affected birds appear to be done with nesting by August 1 in the Jackson Hole area.

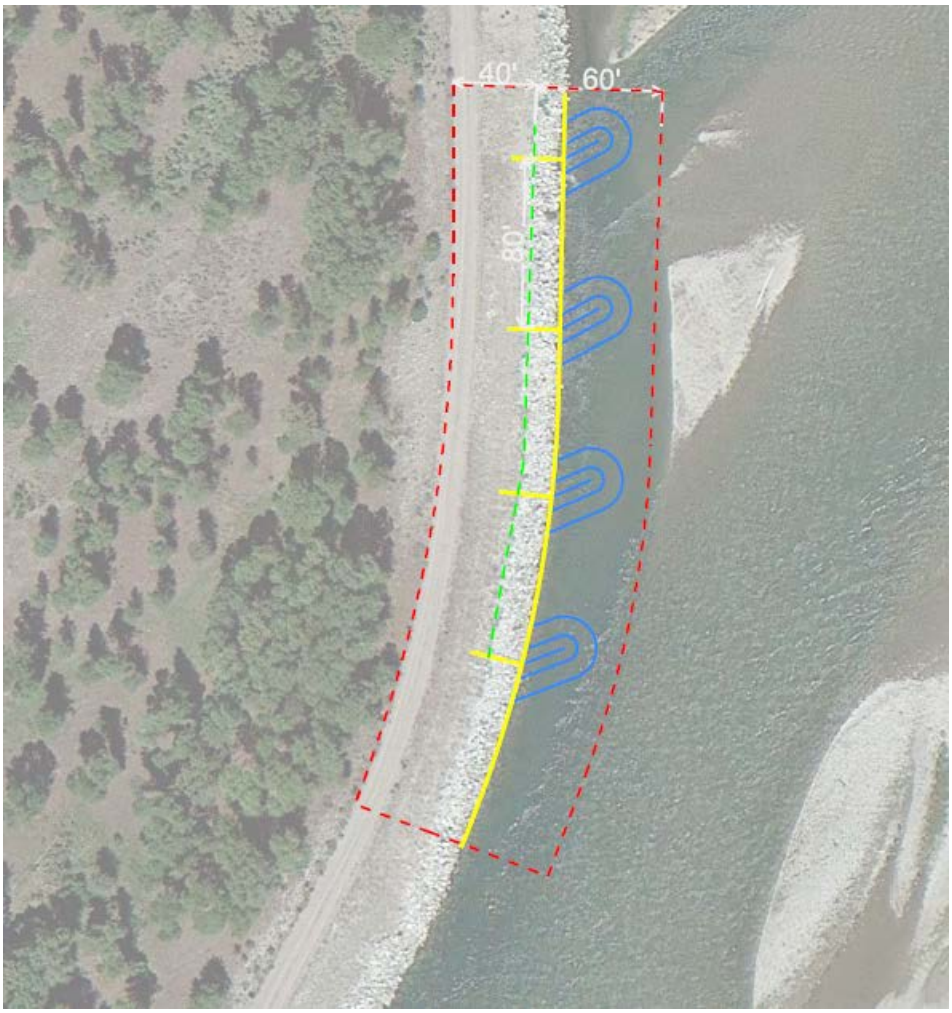

Figure 4. Conceptual figure of bank barbs. (River flow is from top to bottom)

1.3.2.6. Debris clearance

High spring flows often deposit snags near the high water line and along levees as flood levels subside. These snags pose a future threat to portions of the levee system

through direct impingement or deflection flow that may cause damage during future flood stages. To avoid future localized damage to the levees, snags and other debris are removed periodically in the fall. Equipment involved is an excavator and a dump truck. This material is hauled off-site and disposed of using methods such as chipping, composting, landfilling, or burning.

1.3.2.7. Culvert cleaning and repair

Culvert cleaning and repair is needed to ensure culverts can adequately pass water to protect the levees and access roads. Culverts may need cleaning to remove sediment after a flood event. Every five years the Corps performs cleaning and video inspection of the culverts as required by Corps standards. Cleaning can involve using an excavator to remove vegetation and sediment from the culvert inlet and outlet, "vacuuming out" material inside the culvert, and using high-pressure hydraulic jetting to remove the remaining debris within the culvert. Once the interior of the culvert is cleaned, the Corps can then use a video camera or other appropriate method to inspect the interior of the culvert.

If necessary, the Corps may remove vegetation from an area extending up to 50 feet both upstream and downstream from the culvert, and extending up to 15 feet outward from both the waterward and landward toes of the levee. The intent of clearing this larger footprint is to prevent tree and shrub roots from penetrating the culverts.

The sediment and vegetative material will be disposed of upland in a legal manner. If water is flowing through the culverts during the work period, the Corps constructs temporary cofferdams to minimize turbidity. Water from within the cofferdam is pumped to the inland slope of the levee where it percolates into the ground.

There are three types of culverts in the JHFPP:

1) Return flow/drainage culverts – During a flood event, water typically rises on the landward side of the levees due to seepage and rainfall. Culverts are present at strategic locations in the levees to allow water to flow through the levees and back to the river as the water recedes rather than allowing water pressure to build up and erode the levees from behind. These culverts also allow water to drain from the land side in the event of a levee failure. The project has 14 of these culverts, primarily in the Federal levees. These culverts are the responsibility of the Corps.

2) Irrigation culverts – These culverts are designed to control and pass water for farming or water supply purposes. There are 22 such culverts or systems of culverts in the JHFPP. All of these have lift gates, typically on the river side. Most of these are located to appropriate water from the Snake River, but some are located to return excess appropriated water back to the Snake or Gros Ventre Rivers. The culvert structures through the levees are the responsibility of the Corps while the lift gates are the responsibility of the Corps and/or the water appropriators. There are typically

diversion structures constructed or maintained annually by the water appropriator(s) to ensure water can flow to the culvert.

3) Access road culverts – These culverts are placed to ensure access roads do not impound water. There are 29 culverts or systems of such culverts located on the levee access roads of the JHFPP. Maintenance of these culverts is a shared responsibility between the Corps and the landowners. These culverts are not video inspected.

The Corps is proposing to perform repair, rehabilitation, and replacement of the culverts in addition to the cleaning and inspection. The Corps would consider actions such as lining the culverts, repairing or replacing head gates, repairing or replacing headwalls and wingwalls, and replacing culverts. Head gates control the entrance or exit of water from the culverts. Headwalls and wingwalls are concrete wall-like structures that support and protect the culvert entrance and head gates.

The Corps may line culverts that are not failing. One method that may be used is slip lining. This involves inserting a smaller diameter liner “pipe” into the existing corrugated metal pipe culvert using an excavator, come-a-longs, and chains. Liner piping is commonly made of high density polyethylene (HDPE). The liner pipe would be in sections that are snapped together to form a liner for the entire length of the culvert. As each section of liner pipe is snapped together, an excavator would push the liner into the culvert until the culvert is completely lined. Once the liner is in place, the ends would be sealed and the space between the liner and the culvert would be backfilled with grout.

Slip lining does not require excavation. It works well in areas where conventional trenching would have an unacceptable effect on vehicular movement on the roadway above the culvert. Slip lining is also useful when the culvert is far enough below the levee surface that significant excavation would be required to replace the culvert.

The Corps would also repair or replace the head gates and/or headwalls on the culverts. Head gates control the entrance or exit of water from the culverts. Headwalls and wingwalls are concrete wall-like structures that support and protect the culvert entrance and head gates. Some of the head gates are hinged and open or close when water presses against them (Figure 5). Others are opened or closed by manually turning a screw to raise or lower the gate (Figure 6). Some gates that are not functioning properly may be repaired by lubricating the hinges. Other gates that are not sealing or cannot be fully opened or closed would likely be replaced. In some cases just the gate would be removed and a new gate installed in its place. For other gates, the concrete headwall would also need to be replaced. Equipment used to perform the work could include a backhoe or excavator, dump truck, and cement truck. Replacement of either the head gates or headwalls could require using a backhoe or excavator to lift the old gate and lower the new gate. The same equipment could be used to remove the old concrete wall and clear debris and sediment from the worksite. The dump truck would haul the debris to an appropriate disposal site. Measures would

be taken to isolate the work area from the river to prevent turbidity from entering the water. Forms for the new concrete headwall would be constructed and concrete would be placed to form the new headwall. This activity would take place in summer or fall when flows in the rivers are low and the temperature is mild.

Figure 5. Flapper-type headgate on drainage culvert

Figure 6. Manually operated headgates on an irrigation intake culvert

The Corps may also replace culverts that are failing and cannot be repaired. These culverts would usually be replaced following the same alignment, or they may be realigned to improve water passage or to reduce sedimentation. The Corps does not anticipate relocating irrigation culverts as that would require relocating at least part of the associated irrigation ditch.

Culvert replacement could be in-kind or through consolidation of multiple pipes. Drainage culverts in the JHFPP have only one pipe and would likely be replaced with a single pipe. Irrigation culverts in the JHFPP have multiple pipes. Replacing these culverts could include replacement in kind, or replacing multiple smaller pipes with one or two larger pipes. Factors influencing which approach to use include site-specific hydraulic analysis, ability to pass the needed flows, depth of cover over the pipes having adequate bearing capacity, safety concerns, and cost. Culvert replacement would involve excavating through the levee with an excavator or excavator to uncover and remove the old pipe, preparing the trench, placing the new pipe in the trench, and backfilling the trench with rockfill and riprap. A new headwall would be constructed and new headgates installed. As with culvert cleaning, measures would be implemented to isolate the work area to prevent turbidity in the rivers.

Culvert repair and replacement would probably take place in late summer or fall when Snake River flows are low and the temperatures are relatively mild.

1.3.2.8. Vegetation removal

The Corps performs vegetation control and removal activities on the levees annually as vegetation impairs the Corps' ability to conduct visual inspection and can damage the levees. This vegetation removal can be done as part of other O&M activities such as levee rehabilitation or culvert cleaning, or as a separate action. The Corps' Federal levee standards require the levee crown to be free of vegetation to allow for damage inspection. The standards also require removal of woody vegetation from the levee surface as the roots can create a pathway for water to seep into the levee (piping), creating a weak spot that can lead to levee failure during a flood event. Large trees on the levee can be toppled by high waters and can create a hole in the levee as the root wad pulls out rock from the levee surface and core.

The Corps uses both mechanical and chemical methods to control vegetation. All access is from the top of the levee. Mechanical methods involve using a backhoe or excavator to pull the woody vegetation, including the roots, from the levee. Larger trees may require pulling some of the rock away from the base of the tree, then pulling the tree over before pulling it out. Large roots are dug up until the root diameter is no more than ½ inch. The holes are then backfilled with rockfill or riprap.

Chemical methods involve spraying herbicide on weeds and woody vegetation (trees less than six feet tall and shrubs). Approximately 30 days after spraying or once the woody vegetation has died, the Corps would begin removal of the dead woody vegetation. The Corps would cut the dead woody vegetation at ground level primarily with hand-held pruners, or a chainsaw, if needed.

All woody vegetation removed from the levees using either method is hauled off-site for appropriate disposal. The dead woody vegetation may be temporarily stockpiled before being chipped in a portable chipper that would be towed behind a pickup truck. All vehicles and equipment would stay on existing roads and levee crests. Disposal of the dead vegetation would be conducted in a manner consistent with all Federal, State, and local regulations.

Although the Corps' policy under Engineering Technical Letter (ETL) 1100-2-583 generally requires the levee prism be free of woody vegetation as well as a clear zone 15 feet on each side of the levee extending from the toe outward, the Corps has not been complying with this requirement. The Corps has been removing woody vegetation from the levee prisms on the waterward side, but on the landward side the Corps has been removing woody vegetation from only within about 10 feet of the levee crown to provide safe driving conditions on the levees. The Corps has not been removing large trees on the landward side of the levees beyond 10 feet of the crown. The Corps has also not been removing woody vegetation from the 15-foot clear zone on either side of

the levees. The Corps has not been fully complying with the ETL because of funding and prioritization of O&M activities.

Future funding and priority changes may enable the removal of vegetation in accordance with the ETL. If this happens the entire landward side of the levee prism and the 15-foot clear zone extending outward from both the waterward and the landward toe of the levees would be cleared. If the 15-foot clear zone extends beyond the easement boundary, the Corps would remove trees and shrubs only from within the easement boundary. This woody vegetation removal would be in compliance with the Corps' levee standard described in the ETL. The Corps anticipates being able to reach all of the affected vegetation with an excavator stationed on the levee. The Corps would remove all woody vegetation from these areas using the mechanical methods described above. The Corps would backfill the holes in the levee prism with suitable levee rockfill and riprap, but may or may not bring in rock or soil to backfill the remaining holes in the 15 foot clear zone. The Corps may or may not use the bucket of the excavator to push any lifted soil back into the holes when working in the clear zone. The need and manner of filling holes would be determined on a case by case basis.

Some of the trees and shrubs in the clear zone may be located in wetlands. The Corps may or may not push any lifted soil back into the hole when removing the woody vegetation from wetlands. The Corps would perform mitigation, if required, to offset the effects on the wetlands.

The Corps may choose to allow some vegetation to remain on the landside of the levees if the levees have been overbuilt. This is when extra rock and/or soil has been placed over the levee prism (Figure 7). ETL 1110-2-583 allows use of this overbuilt area as a planting berm for herbaceous and woody vegetation as long as the roots do not penetrate a zone at least three feet deep over the levee surface.

Some vegetation removal may start in early July as opposed to 1 August. The early time frame would allow the Corps more time to complete work. If the Corps decides to begin vegetation removal before August 1 and the work has the potential to destroy nests or nestlings of migratory birds, the Corps would perform a nest survey of the work area and leave a buffer zone around any active nests until the birds have fledged. If the Corps decided to start work August 1, no nest surveys would be needed as data from nesting surveys of the levees conducted by the Corps in 2014-2016 has shown nestlings appear have fledged as early as July 15 and have definitely left the nest by August 1. If two more years of nest surveys show nestlings have fledged by July 15, the Corps proposes to start work as early as July 15 without conducting nesting surveys

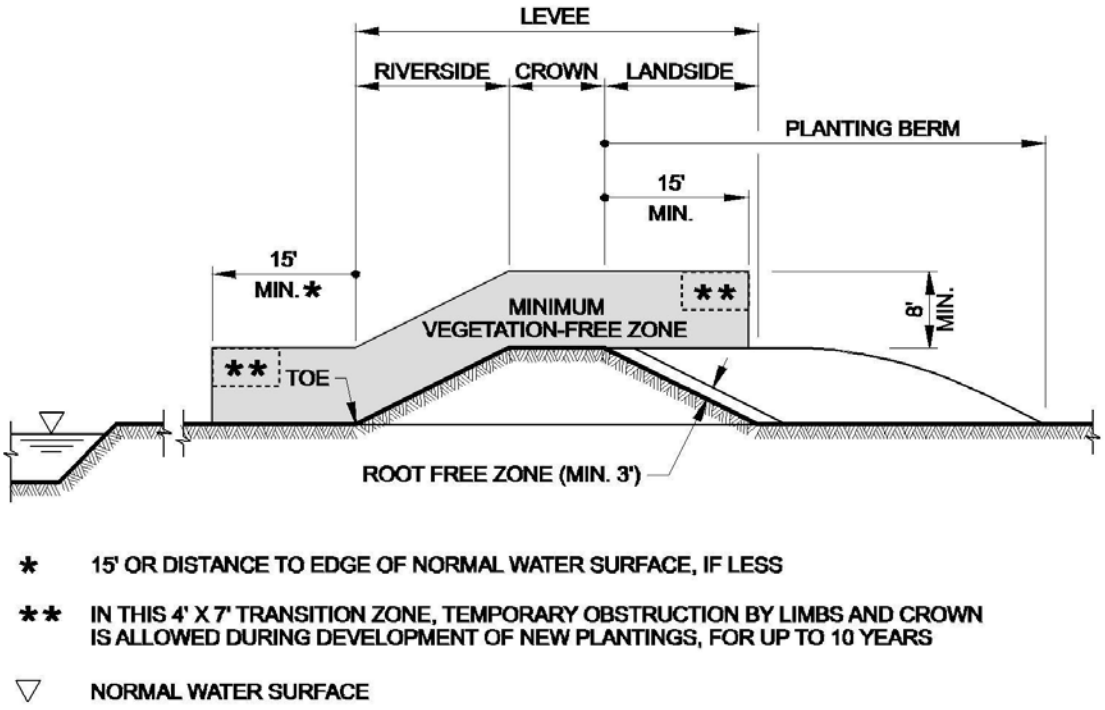

Figure 7. Levee Section with Planting Berm

1.3.2.9. Access road maintenance

Access roads are maintained on an as-needed basis. Access roads connecting the public roads to the levee system are periodically plowed, graded, and graveled to assure equipment and materials can reach the levees without difficulty. This work involves two or three dump trucks, a road grader, and possibly a vibratory roller for compaction.

Access road maintenance may be expanded to include additional turnarounds to accommodate changes in equipment. These turnarounds could be located on either side of the levee, but would usually be located on the landward side. For expanded turnarounds, the Corps would lengthen the existing turnaround perpendicular to the levee to allow large trucks and trucks with pup trailers to back into a turnaround area and make a three-point turn. Vehicular access to the levees is only allowed on designated roads or the crown of the levee. It is not practical for trucks to back down a levee as it may be several miles to an access road. For additional turnarounds, the Corps would attempt to locate previously disturbed areas within the easement boundary. If the extension or the additional turnaround would go beyond the easement boundary, the Corps would request Teton County obtain access to the additional land. The Corps would then clear vegetation from the site, bring in fill material as needed, grade the site, and add gravel for a driving surface.

The Corps would avoid wetlands if possible. If wetlands could not be avoided, the Corps would minimize the wetland disturbance and perform any required mitigation.

The addition the turnarounds may require acquisition and development of additional land under easement. These issues were not addressed in the 1990 O&M Decision Document/EIS.

1.3.3 Best Management Practices

The Corps will use Best Management Practices (BMPs) to ensure that all Federal, State, and local laws are adhered to as well as to minimize impacts to environmental resources. These practices include the following:

1) Maintain a buffer distance around eagle nests of 330 feet, non-line of sight and 660 feet line of sight, during eagle nesting season (February 1 through August 15). The buffer distance around other raptors will be 150 feet.

2) If work is to be conducted during the migratory bird nesting timeframe (April 1 through August 1), an avian biologist will survey for active nests within the project area, establish appropriate buffers in accordance with the protocol outlined in 1.3.4 Avian Biologist Surveys.

3) In the unlikely event that a wolverine or lynx enters the project area, personnel will maintain a 100-yard buffer between the animal and themselves.

4) All pesticide applicators will be state commercial licensed.

5) All pesticide applicators will comply with applicable federal, state, and herbicide manufacturer's directions and requirements for handling herbicides and insecticides, including storage, transportation, application, container disposal, and cleanup of spills.

6) Herbicide treatments to foliage of weed species will be according to the chemical manufacturer's recommendations for best results, or according to this document, whichever is the more stringent standard.

7) All application equipment (back packs) will be properly calibrated according to the chemical manufacturer's suggested application rates printed on the chemical label prior to use. Equipment settings will be properly maintained for the duration of the application period.

8) Application equipment will be maintained to ensure proper application rates, to minimize leakage potential, reduce the potential for drift, and ensure applicator safety. Equipment will be maintained, visually inspected prior to each application. This includes, but is not limited to hoses, nozzles, backpacks, and booms.

9) Pesticide applications are limited to air temperatures of 90 degrees Fahrenheit or less, unless the label conditions are more restrictive.

10) Pesticide applications are prohibited 24 hours prior to a predicted precipitation event sufficient to cause runoff.

11) Pesticide applicators will not spray if snow or ice covers the target foliage.

12) All pesticide applicators will carry a Spill Prevention and Control Plan. The Plan will provide detailed descriptions on how to prevent a spill or ensure effective and timely containment of any chemical spill. The Spill Prevention and Control Plan will include spill control, containment, cleanup, and reporting procedures.

13) A spill kit will be available to all persons making applications within 150 feet from the site of the application.

14) Refueling of equipment in areas not designed for refueling will not occur within 100 feet of open water.

15) Each applicator vehicle carrying herbicides will be equipped with a spill cleanup kit. The cleanup kit will be capable of containing and holding at least 125% of the total mixture and concentrate that are present on the work site.

16) The pesticide applicator will report all details of herbicide spills, exposure incidents or accidents and/or worker health complaints, if any occur, to the Corps as soon as practicable. Applicator vehicles equipped with secondary containment must have a spill cleanup kit available within a 5 minute response time.

17) The Corps will schedule routine (non-emergency) O&M work to avoid adversely affecting wildlife, specifically nesting birds. Efforts to avoid impacts to birds will follow the protocol outlined below in section 1.3.4 Avian Biologist Surveys.

1.3.4 Environmental Considerations and Responsibilities

Avian Biologist Surveys

The Corps schedules levee maintenance activities especially vegetation removal to avoid adversely affecting nesting birds. The dates of avoidance are from April 1st to August 1st for migratory birds, and February 1st to August 15th for eagles.

If the Corps plans to start O&M activities that may affect birds earlier than August 1st for migratory birds and August 15th for eagles then the Corps will perform a bird nest survey. Surveys will be done, at a minimum one day, but not more than five days prior to O&M activities that may affect migratory birds. A certified avian biologist will survey

the identified treatment sections for MBTA on the levees and raptor nests near the levees. If active migratory bird nests are found, they will be marked and a buffer will be identified around the nest. No spraying will occur within the 15 foot buffer areas around any migratory bird nest. Pending guidance from HQ-USACE on the requirements of the Migratory Bird Treaty Act could reduce the size of (or need for) the buffers described above for nesting migratory birds. The avian biologist will prepare a report summarizing the nests found, species present, the avian activity, and any other pertinent details. Non-eagle raptor nests would have a 150 foot buffer. Eagle nests will have a buffer of 330 feet if they are not in line of sight and 660 feet if they are in line of sight. Any yellow-billed cuckoo nests encountered will be buffered in accordance with the guidance provided by the Wyoming Field Office of the U.S. Fish and Wildlife Service. The avian biologist will continue monitoring the active nests weekly and report to the Corps any nests that have become inactive.

These buffer zones are consistent with those in the July 2006 Memorandum of Understanding (MOU) between the U.S. Department of Defense and the U.S. Fish and Wildlife Service to Promote the Conservation of Migratory Birds. Pending guidance from HQ-USACE on the requirements of the Migratory Bird Treaty Act, the size of (or need for) the buffers described above for nesting migratory birds could be reduced.

The Corps has multiple years of MBTA bird surveys that demonstrate the birds are fledging before July 15. If two additional years of survey data show that the birds are fledging before July 15 the Corps will move the standing work start date to July 15 without doing additional surveys.

1.4 Project Timeline

While most work, specifically vegetation removal and construction activities, would take place from July 5 to March 31 some actions may take place any time during the year.

2 Listed Species

2.1 Species Listed for the Project Area

On January 25, 2018 the Corps reviewed the list of threatened and endangered species that may occur in the project area under the jurisdiction of the USFWS (Table 1). Because they would be temporally or spatially separated from the proposed action, the Corps has determined that the proposed action would have no effect on whitebark pine, Canada lynx, or wolverine. Consequently, they will not be discussed in detail.

Table 1. List of threatened and endangered species in the project area and the Federal Register notices listing these resources. Consultation Code 06E13000-2017-SLI-0448. While still on the IPAC, Grizzly bear has been delisted during the last year.

Species	Listing Status and Reference	Critical Habitat
Canada lynx (*Lynx canadensis*)		
Contiguous U.S. DPS	T 3/24/00; 63 FR 16051	2/25/09; 74 FR 8615
Grizzly Bear *(Ursus arctos horribilis)*		
Delisted	DL 6/22/2017	Not applicable
North American Wolverine (*Gulo gulo luscus*)		
Proposed Threatened	PT 02/04/13; 78 FR 7864	Not applicable
Yellow-billed cuckoo (*Coccyzus americanus)*		
Threatened	T 10/3/14; 79 FR 59991	11/12/2014; 79 FR 67154
Whitebark Pine *(Pinus albicaulis)*		
Candidate	C 1/27/94; 59 FR 3824	Not applicable

2.2 Species Status

2.2.1 Canada Lynx

2.2.1.1 Listing History

Canada lynx in the U.S. Distinct Population Segment (DPS) were listed as threatened on March 24, 2000 (USFWS 1998). On July 3, 2003, in response to a court-order to reconsider the listing, the USFWS clarified their final listing decision. Canada lynx critical habitat was designated on March 27, 2009 and revised on September 12, 2014. This population segment occurs in forested portions of the States of Colorado, Idaho, Maine, Michigan, Minnesota, Montana, New Hampshire, New York, Oregon, Utah, Vermont, Washington, Wisconsin and Wyoming. In Wyoming, critical habitat for the Canada lynx (50 CFR 17.95(a)) has been designated for portions of Fremont, Lincoln, Park, Sublette, and Teton Counties, including parts of Yellowstone National Park and the Bridger-Teton and Shoshone National Forests.

2.2.1.2 Life History/Biological Requirement

Lynx habitat can generally be described as moist boreal forests that have cold, snowy winters and a high-density snowshoe hare prey base. In the western contiguous United States, boreal forests transitions to subalpine forest. Individual lynx maintain large home ranges generally between 12 to 83 square miles. The size of lynx home ranges varies depending on abundance of prey, the animal's gender and age, season, and the density of lynx populations (Ruggiero et al. 2000).

Snowshoe hares are the primary prey of lynx, comprising the bulk of the lynx diet throughout its range. Without high densities of snowshoe hares, lynx are unable to sustain populations despite utilizing a multitude of other prey when snowshoe hare numbers are low. Other prey species include squirrels, grouse, porcupine, beaver, small rodents, fish, and ungulate carrion.

Breeding occurs through March and April in the north. Kittens are born in May to June in south-central Yukon. The male lynx does not help with rearing young. Yearling females may give birth during periods when hares are abundant. During periods of hare abundance in the northern taiga, litter size of adult females averages four to five kittens. Litter sizes are typically smaller in lynx populations in the contiguous United States (Ridgely et al. 2003).

Decline of the lynx population has been attributed to timber harvesting and management that reduces forest understory, climate change, fire suppression, habitat fragmentation, road-building, and recreational and energy/mineral development.

2.2.1.3 Distribution

Canada lynx are considered historical residents in 16 states, including: Washington, Oregon, Idaho, Montana, Wyoming, Utah, Colorado, Minnesota, Wisconsin, Michigan, Maine, New Hampshire, Vermont, New York, Pennsylvania, and Massachusetts. Resident populations currently exist only in Maine, Montana, Washington, and possibly Minnesota. This species is considered extant, but no longer self-sustaining in Wisconsin, Michigan, Oregon, Idaho, Wyoming, Utah, and Colorado. Populations may be extirpated from New Hampshire, Vermont, New York, Pennsylvania, and Massachusetts (Ruggiero et al. 2000).

2.2.1.4 Local Empirical Information

Historically, lynx were observed in every mountain range in Wyoming. The majority of lynx observations presently occur in western Wyoming in the Wyoming and Salt River ranges and north through the Tetons and Absaroka ranges in and around Yellowstone National Park. Numerous records have also come from the west slope of the Wind River Range, with fewer observations in the Bighorn and Uinta mountains.

2.2.2 Grizzly Bear

2.2.2.1 Listing History

In 1975 the USFWS listed grizzly bears as threatened under the ESA in the lower 48 states. On June 22, 2017 the USFWS announced the grizzly bear had reached its population goals and was delisted in the Greater Yellowstone Ecosystem. USFWS Information for Planning and Consultation website (IPaC) has not been update to reflect the delisting.

Given their current status of delisted, grizzly bear will not be further addressed in this document.

2.2.3 Wolverine

2.2.3.1 Listing History

North American wolverines were originally proposed for listing as threatened under the ESA on February 2, 2013. The reasons for the initial listing proposal were concerns from climate change, habitat loss, incidental trapping, and human interactions from winter recreation. This proposed listing was subsequently withdrawn in August of 2014. The reason for the withdrawal was due to challenges to the original modeling and data used for the proposal. The withdrawal was legally challenge and a court ruling on April 4, 2016 resulted in wolverines being relisted as proposed threatened. No critical habitat has been designated.

2.2.3.2 Life History/Biological Requirements

The wolverine is the largest terrestrial member of the family Mustelidae. Adult males weigh 26 to 40 pounds and adult females weigh 17 to 26 pounds. It has a broad, rounded head; short, rounded ears; and small eyes (USFWS 2016).

The animals live in remote areas away from human populations, with their primary habitat near timberline. Denning occurs in the spring and generally above 8,200 feet.

They are highly solitary animals, leading to low population densities. Wolverines appear sensitive to human disturbance. Viable populations may require expansive wilderness areas with minimal human presence.

Home ranges are large and can cover up to 400 square miles for males. They are opportunistic and consume a variety of foods. They scavenge for dead animals during the winter, while their summer diet is made up of small mammals.

Wolverines have made a steady recovery in the past half century after hunting, trapping and poisoning nearly extirpated the species form the lower 48 states in the early 1900's.

2.2.3.3 Distribution

Wolverines distribution is Holarctic. In North America wolverines are currently found in the North Cascades in Washington, the Northern Rocky Mountains in Idaho, Montana, Oregon (Wallowa Range), the Uinta Mountains in Utah, and Wyoming. Individual wolverines have also moved into historic range in the Sierra Nevada Mountains of California, and the Southern Rocky Mountains of Colorado, but have not established breeding populations in these areas.

2.2.3.4 Local Empirical Information

In recent times, wolverines have inhabited the greater Jackson Hole area in small numbers, specifically the Teton National Park, up to at least 2008. Efforts to find these animals in areas known to have once had them in the Park has proven difficult with only one male being found. Recent surveys, have encountered at least one wolverine in the Wind River Range, Absarokas, and the head waters of the Gros Ventre. However given

that the principle wolverine range is at higher elevations, often associated with timber line, the animal is not expected to be in the project area.

2.2.4 Yellow-billed Cuckoo

2.2.4.1 Listing History

The Western distinct population segment of the yellow-billed cuckoo was listed as threatened on November 3, 2014 for all states west of the Continental Divide (FR 50 CFR Part 17). Critical habitat was proposed on August 15, 2014 (79 FR 48547 48652) and includes Henry's Fork of the Green River, Sweetwater, and Uinta Counties in Wyoming. There is no proposed critical habitat in Jackson Hole, Wyoming for the yellow-billed cuckoo.

2.2.4.2 Life History/Biological Requirements

Yellow-billed cuckoos live mainly among the canopies of deciduous trees. In the West, this species is rare and restricted to the cottonwood-dominated forests that line larger rivers running through arid country. Cuckoos nearly always place their nest in willows and forage primarily in cottonwoods. Also, home ranges of nesting cuckoos generally have a greater proportion of willows than cottonwoods (Laymon et al. 1997). Cuckoos generally require groves of deciduous woods with thick brush or hedgerows that provide dense foliage in the lower canopy. Their diet consists mainly of tent caterpillars, cicadas, or large arthropods. In fall, areas with fall webworm infestations often support yellow-billed cuckoos.

Eastern and western yellow-billed cuckoos are highly migratory, and the two populations may spend winters in overlapping regions in South America. However, yellow-billed cuckoo populations in the east and west differ in the timing of arrival on the breeding grounds in the spring. Yellow-billed cuckoos in western North America arrive on the breeding grounds four to eight weeks later than eastern yellow-billed cuckoos at the similar latitude.

Timing of spring migration and arrival on the breeding grounds has been determined to be the result of an evolved response under genetic control, and is likely caused by east-ward climatic, habitat, and food availability differences. Western yellow-billed cuckoos nest between June 15 and August 15 of any year.

2.2.4.3 Distribution

The geographical breeding range of the yellow-billed cuckoo in western North America includes suitable habitat within the low-to moderate-elevation areas west of the crest of the Rocky Mountains in Canada, Mexico, and the United States, including the upper and middle Rio Grande, the Colorado River Basin, the Sacramento and San Joaquin River systems, and the Fraser River. In Mexico, the range includes the Cape Region of Baja California Sur, and river systems in the Mexican States of Sonora, Sinaloa,

western Chihuahua, and northwestern Durango. The species is rare at elevations above approximately 6,000 feet and almost never breeds above 7,000 feet. Exceptions to the elevation limit do occur and recent records of yellow-billed cuckoos have been confirmed above 6,000 feet in areas of Lower Green River Basin from Seedskadee National Wildlife Refuge to the Flaming Gorge Reservoir, and west to the Yampa River near Craig in Northwest Colorado, and the Rio Grande River near Del Norte, and San Luis Valley of south-central Colorado; and the Henry's Fork of the Green River in Utah and Wyoming. In the northern Rocky Mountains and northern Great Plains-from the Canada border south through Colorado-the yellow-billed cuckoo is "extremely rare and local" as a breeding bird both east and west of the Rocky Mountains.

2.2.4.4 Local Empirical Information

In Wyoming, the yellow-billed cuckoo is dependent on large areas of woody, riparian vegetation that combine a dense shrubby understory for nesting and a cottonwood overstory for foraging. Destruction, degradation, and fragmentation of wooded, riparian habitats are continuing threats to yellow-billed cuckoos in Wyoming. Additionally, project actions to control outbreaks of caterpillars, cicadas, or grasshoppers and general use of insecticides in or adjacent to riparian areas may negatively affect yellow-billed cuckoos.

Wyoming ranks the abundance of yellow-billed cuckoos, as "very rare" (fewer than 1000 resident individuals). It is also considered an "uncommon summer resident". There have been relatively few observations reported in Wyoming and fewer still that have documented breeding. Wyoming Natural Diversity Database has a total of 66 recorded observations in Wyoming, including 39 Wyoming Game and Fish Department Wildlife Observation System records, 7 Breeding Bird Survey records, 17 incidental observations, 2 specimens and 1 survey record. Breeding was documented within the city limits of Sheridan in 1980 (Downing 1990). Within the last 25 years breeding was suspected along East Wolf Creek and Big Goose Creek near Sheridan, along the North Platte River in Rawhide Wildlife Habitat Management Area (WHMA), near Springer WHMA in Goshen County, and along the South Fork Miller Creek north of Sundance (Bennett and Keinath, 2003).

2.2.4.5 Ongoing Monitoring

The Corps has conducted bird nesting surveys to document bird species occurrences on various levee systems in Jackson Hole within the Snake River and Gros Ventre riparian corridor for the past two years. One cuckoo responded to a vocalization call in June 2017, however three subsequent surveys taken during the year in the area failed to encounter a bird. No cuckoos or their nests have been observed within this surveyed area. The last sighting of a cuckoo was a dead bird encountered in the town of Wilson over a decade ago. According to the Wyoming Game and Fish, there have been infrequent, transient cuckoos caught in mist nests during fall migration; however these are extremely rare occurrences. Given the low encounter rate with yellow-billed cuckoos in the area, specifically the failure to recontact the bird during 2017 breeding

season, yellow-billed cuckoo are not believed to be breeding nor seasonal resident in the Project area.

2.2.5 Whitebark Pine

2.2.5.1 Listing History

Whitebark pine is a candidate for listing under the Endangered Species Act. On July 18, 2011, the USFWS assigned the whitebark pine a listing priority number of 2, which means that the species is on the verge of extinction. Its decline is attributed to habitat loss and mortality from white pine blister rust, mountain pine beetle, catastrophic fire and fire suppression, environmental effects resulting from climate change, and the inadequacy of existing regulatory mechanisms.

2.2.5.2 Life History/Biological Requirements

Whitebark pines are slow-growing, long-lived trees with a life span of upwards of 500 years and sometimes over 1,000 years (Fryer, 2002).

This tree is a 5-needled conifer species placed in the subgenus *Strobus,* which also includes other 5-needled white pines. It is typically 16 to 66 feet tall with a rounded or irregularly spreading crown shape. On higher density conifer sites, it tends to grow as tall, single-stemmed trees, whereas on open, more exposed sites, it tends to have multiple stems (Tomback 2001). Above tree line, it grows in a krummholz form (stunted, shrub-like growth). This pine species is monoecious, (both male pollen and female seed cones are on the same tree). It is found to dominate at high-elevation settings on harsh sites in the upper subalpine forests and at tree line on relatively dry, cold slopes.

The seeds are dispersed to new open areas of establishment by Clark's nutcrackers and squirrels caching seeds. Because two or more whitebark pine seeds are often cached together, several seedlings from a cache may survive and produce a "tree cluster" growth form. It establishes in the high elevations of the mountaintops approximately 4,300 to 12,100 feet elevation. Whitebark pine seedlings take five to seven years to become fully established and start significant height growth.

Non-lethal surface fires have historically maintained whitebark pine dominance in the overstory and prolonged whitebark pine cone production by stalling recession. In the absence of fire, the whitebark pine is eventually replaced by the shade-tolerant subalpine fir, spruce, and mountain hemlock.

2.2.5.3 Distribution

The species is found in Coastal Mountain Ranges (from British Columbia, Washington, Oregon, down to east-central California) and Rocky Mountain Ranges (from northern British Columbia and Alberta to Idaho, Montana, Wyoming, and Nevada) and represents approximately 10 to 15 percent of the forested landscape. Roughly 44 percent of the species' range in the United States occur in Wyoming, Montana, Nevada, California, Oregon, and Washington.

2.2.5.4 Local Empirical Information

In Wyoming, whitebark pine occurs in the Absaroka, Teton, and Wind River ranges. It is a component of subalpine fir communities and dominates the highest peaks and ridges over 6,000 feet. While the project is within the habitat elevation of 6,000 feet, the area is a river bottom not conducive to whitebark pine growth. Whitebark pine has not been found to be present within the JHFPP area.

The threats to whitebark pine include habitat loss and morality from white pine blister rust, mountain pine beetle, catastrophic fire and fire suppression, environmental effects resulting from climate change and the inadequacy of existing regulatory mechanisms.

USFWS anticipates whitebark pine forests will likely become extirpated and their ecosystem functions will be lost in the foreseeable future. The species appears to be in danger of extinction, potentially within as few as two or three generations. The generation time of whitebark pine is approximately 60 years.

2.2.5.5 Ongoing Monitoring

The United States Department of Agriculture continues to monitor and establish restoration management of this species throughout the western United States.

3 Effects of the Action

The effects of the action on ESA species are summarized in Table 2.

Table 2. Effect determinations for threatened and endangered listed species that may occur in the project area.

Species	Species Determination	Critical Habitat Determination
USFWS		
Canada Lynx	No Effect	No Effect
Wolverine	No Effect	NA
Yellow-Billed Cuckoo	May Affect But Not Likely to Adversely Affect	NA
Whitebark Pine	No Effect	NA

There is no designated critical habitat for yellow-billed cuckoo, wolverine, or whitebark pine. The habitat requirements for Canada lynx are not found within the project area. Therefore this project will have no effect on the critical habitat for any threatened or endangered species.

3.1 Canada Lynx

Canada lynx inhabits boreal forests with thick understory. Based on their necessary habitat requirements, Canada lynx do not regularly occur in any areas that are part of this proposed action. ***Therefore, the project would have no effect on individuals or designated critical habitat for the Canada lynx.***

3.2 Wolverine

Wolverines are highly secluded animals that avoid human activity. None are expected to frequent the levee project and its associated homes and human activity. Any animals that did would be highly transitory passing over the levees to access other areas further away. In the extremely unlikely event that a wolverine did enter the area, workers would maintain a 100 yard buffer between O&M activities and the wolverine. O&M activities would also maintain a clean working environment, free of any litter, food, or other attractants. ***Consequently, the proposed action would have no effect on wolverine populations.***

3.3 Yellow-billed Cuckoo

While individual birds have been documented, there are no documented populations or breeding pairs of yellow-billed cuckoos within the vicinity of Jackson Hole, either historically or currently. There is also no designated critical habitat for yellow-billed cuckoo in the project area. Further, O&M actions are primarily conducted on or along the levees. Given that yellow-billed cuckoos prefer dense understory, the open areas of the levees reduce the possible impact to yellow-billed cuckoos from these actions. The only documentation of a yellow-billed cuckoo in the last decade was a single vocal response in the spring of 2017. Extensive follow on surveys failed to encounter yellow-billed cuckoos in the area during breeding season. The Corps therefore concluded that the bird was transitory.

Previous consultation was conducted with the USFWS concerning impacts to yellow-billed cuckoos from vegetation removal. USFWS concurred (USFWS 06E13000-2015-0175 and USFWS 06E13000-2015-CPA-0051) that vegetation removal “may affect, but is not likely to adversely affect” yellow-billed cuckoos. The effects on yellow-billed cuckoos are expected to be the same for all O&M activities.

The following measures would be implemented to minimize the effect to cuckoo individuals and populations: 1) minimize work activities within the cuckoo nesting season (Late June to August 1), 2) use an avian biologist to visually

survey work areas within the breeding season a maximum of five days prior to conducting activities that may impact cuckoo habitat, 3) in the event that a cuckoo nest is observed, establish a buffer zone in coordination with the USFWS.

Given the lack of yellow-billed cuckoos encountered in the area, and the implementation of minimization measures the Corps determined that the action "may affect, but is not likely to adversely affect" yellow-billed cuckoos.

3.4 Whitebark Pine

Whitebark pine is not found in the project area. ***Consequently, the proposed action would have no effect on whitebark pine individuals or populations.***

4 Magnuson-Stevens Act - Essential Fish Habitat

The Magnuson-Stevens Act does not apply to the Snake River near Jackson Hole as there are no salmon in the river.

5 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (16 U.S.C. §§ 703-712, as amended) prohibits the taking of and commerce in migratory birds (live or dead), any parts of migratory birds, their feathers, or nests. Take is defined in the MBTA to include by any means or in any manner, any attempt at hunting, pursuing, wounding, killing, possessing or transporting any migratory bird, nest, egg, or part thereof.

The proposed action would have no impact to migratory birds, since the proposed actions would be conducted outside of bird nesting timeframes (April 1 through August 1). If work or vegetation manipulation is needed before August 1, bird nesting surveys would be performed and buffer zones established around active nests as described in section 1.3.4. If the Corps performs two more nesting surveys after 2017 and the surveys continue to indicate the young are fledging by July 15, the start date for O&M activities would move from August 1 to July 15.

6 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) requires consultation with the USFWS and state fish and wildlife agencies to evaluate the impacts to fish and wildlife species where the "waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted… or otherwise controlled or modified" by any agency under a Federal permit or license. The FWCA also requires equal consideration and coordination of wildlife conservation with other water resources development programs.

The Corps' proposed action addresses operation and maintenance of an existing water resources development project. Most of the O&M activities included in the Corps' proposed action would not alter or modify stream-flow or a body of water and would not involve activities subject to this Act. The only activity that would be subject to the FWCA is the construction of rock barbs or weirs to protect the toe of the levee. However, the use of barbs or weirs is not definite nor has a specific scope of work and design been developed for them at this time. If the Corps determines these structures are needed, the Corps would consult with USFWS and the Wyoming Game and Fish Department during the planning process

7 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) prohibits the taking or possession of and commerce in bald and golden eagles, with limited exceptions, primarily for Native American Tribes. Take under the BGEPA includes both direct taking of individuals and take due to disturbance. Disturbance is further defined on 50 CFR 22.3.

Throughout most of the western United States golden eagles are year-long residents (Polite and Pratt 1999), breeding from late January through August with peak activity in March through July (Polite and Pratt 1999). They may also move down-slope for winter or upslope after the breeding season (Polite and Pratt 1999; Technology Associates 2009). No golden eagles are known to occur or nest in the project area.

As of 2015, there are 17 bald eagle nests along the Snake River and Gros Ventre River that are near the Jackson Hole Project area (Figure 8). Six are within 660 feet of the Jackson Hole Levee Project. These are located along Solitude levee (one nest), Walton Quarry levee (one nest), Morgan Levee (three nests), Federal Extension Levee (one nest), and Imeson #1 Levee (one nest). The Corps will establish buffers following the guidelines found in the USFWS National Bald Eagle Management Guidelines (USFWS 2007), around each of these nests and will refrain from performing O&M activities within the buffer until August 15, or earlier if the eaglets have fledged.

Work would be conducted in accordance with the National Bald Eagle Management Guidelines, dated May 2007. Therefore, O&M activities will implement a 660 foot buffer line of sight, 330 foot buffer non line of sight, around any active eagle nests, during the eagle nesting period (February 1 through August 15). Consequently, the proposed action would not conflict with the purposes of the BGEPA and no disturbance or take would occur.

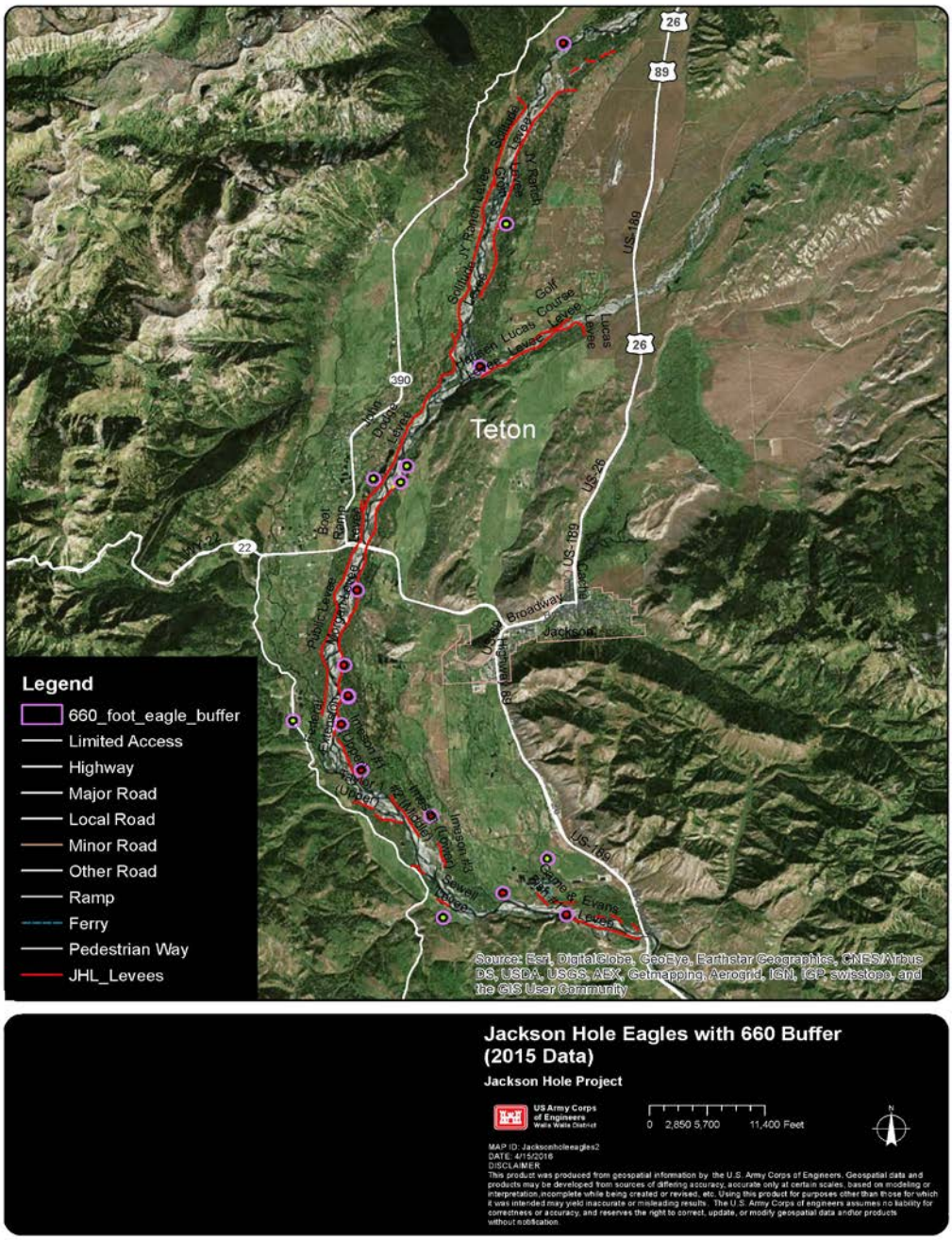

Figure 8. Known Eagle Nests within the Northern Half of the Jackson Hole Project

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