US Army Corps
of Engineers®
Walla Walla District

Little Wood River, Gooding, Idaho

INTEGRATED LETTER REPORT AND ENVIRONMENTAL ASSESSMENT

Authority: Section 3057 of the Water Resources Development Act of 2007, as amended by Section 8335 of the Water Resources Development Act of 2022

December 2023

This page intentionally left blank.

EXECUTIVE SUMMARY

Background

The Little Wood River flows through the city of Gooding, Idaho, in a constructed masonry channel known as the Gooding Canal. In the 1930s, the Works Progress Administration (changed to the Work Projects Administration in 1939) realigned the river and constructed the rectangular channel—made of grouted and ungrouted hand-placed lava rock—over the native lava rock riverbed. The work was completed in 1941 and extends for just under a mile.

Since 1941, the channel has performed well; however, the channel walls have deteriorated significantly, and the rate of deterioration is increasing as it ages. Diminished, but useful functionality of the Gooding Canal has been preserved by the City of Gooding through ongoing maintenance, targeted repairs, and replacement of channel wall sections.

However, the channel walls, constructed with impermanent methods and less resilient materials, are now more than 80 years old and have effectively reached the end of their useful life. Rehabilitation or replacement of the channel walls is warranted.

Many sections of the channel wall have failed, leading to an increase in localized flood risk and threat to adjacent public infrastructure and private property. Slumped piles of masonry lying in the channel have reduced its conveyance capacity. Poor access to the channel, as well as limited equipment and resources, have inhibited the removal of the masonry piles. These slumped piles of masonry allow ice jams to form and debris to accumulate during winter high flow events, severely reducing channel conveyance and resulting in localized overbank flooding.

Water flow in the Gooding Canal also causes localized erosion near the failed sections, leading to further bank failures and soil slumping behind the lava rock walls. Public roads and utilities, as well as private property, are located next to the channel throughout much of its alignment. On private property, these bank failures lead to the loss of land and increased risks to nearby structures.

The Gooding Canal, as originally constructed, included five vehicular bridge crossings and three pedestrian footbridges. The bridges are in good condition and have been well maintained, but the designs of the vehicular bridge crossings reduce channel width by as much as 4 feet in some locations, creating pinch points during high flows that contribute to ice jamming and localized flooding. The Gooding Canal is also used for irrigation, and water flows in and out at many locations. The highest flows usually occur during the non-irrigation season, when natural flows are high and little water is diverted for irrigation. During low flow periods in the winter, the river may freeze solid. As part of routine channel maintenance, the City of Gooding uses mechanical equipment to break up ice in the channel to reduce the risk of localized flooding. Winter high water events are primarily caused by rain-on-snow, or other snowmelt events.

Sponsor

The City of Gooding is the Non-Federal Sponsor (NFS) for this project. The NFS is unable to perform substantial repair to the masonry channel due to limited funding and technical expertise. Investigations performed for the preparation of this Little Wood River, Gooding, Idaho, Integrated Letter Report and Environmental Assessment (ILR/EA) verify that the NFS has performed proper maintenance over time to maintain public safety and channel operability; however, due to the original construction methods, channel deterioration has continued to worsen, leading to higher emergency repair costs for the NFS. The extent of wall failure has exceeded the NFS's capability to effectively repair even the worst areas.

Study Authority

Section 3057 of the Water Resources Development Act (WRDA) of 2007 directed "...the Secretary to rehabilitate the Gooding Channel [Gooding Canal] project for the purposes of flood control and ecosystem restoration..." if rehabilitation is feasible and not required due to improper operation and maintenance by the NFS. The Secretary was directed to plan, design, and construct the project at a total cost of $9,000,000.

The WRDA 2007 legislation directed that rehabilitation costs be shared by the Secretary and the NFS in the same percentages as the original construction costs (assumed to be 100 percent Federal). The costs of operation, maintenance, and repair costs are the responsibility of the NFS, per the legislation. The legislation also states, "Reconstruction efforts and activities carried out under this section shall not require economic justification."

Although WRDA 2007 also directed the U.S. Army Corps of Engineers (USACE) to investigate the feasibility of incorporating ecosystem restoration into the channel rehabilitation, the NFS was unable to provide the necessary Land, Easements, Rights-of-Way, Relocations and Disposal sites (LERRDs) for an ecosystem restoration project. As such, those opportunities are limited to small and ancillary features, which were determined to have no major environmental quality benefits. Therefore, the ecosystem restoration part of this project was deemed infeasible, and plan formulation efforts were focused on channel rehabilitation.

Section 8335 of WRDA 2022 amended Section 3057 of WRDA 2007 by striking the total authorized cost of $9,000,000 and amending it to $40,000,000. It was directed that project costs be shared 90 percent Federal and 10 percent non-Federal, bridges be included in the cost-shared plan, and the NFS be provided an option to finance their share of the construction costs over 30 years.

Plan Formulation, National Environmental Policy Act, and Recommended Plan

The need to rehabilitate the Gooding Canal was determined *not* to be caused by negligence on the part of the NFS. The justification for this finding is included in Section 2 of this document.

A July 2000 Section 905(b) report (Reconnaissance), conducted under authority of Section 416 of WRDA 1999, found Federal Interest in the restoration and repair of the Gooding Canal and computed a benefit-cost ratio of 1.8. A National Economic Development (NED) plan for flood risk reduction was not developed for this project because economic justification is not required, per WRDA 2007. Instead, the ILR/EA recommends the least cost alternative that meets the intent to rehabilitate the Gooding Canal. Following the USACE six-step planning process produced only one action alternative (Alternative 4) and the No Action Alternative that were carried forward into the final array of alternatives evaluated. Of those, only Alternative 4 (Recommended Plan, which is also the Preferred Alternative under the National Environmental Policy Act [NEPA]), meets the Purpose and Need, the planning criteria for completeness, effectiveness, efficiency, and acceptability; meets the directive in the project authorization language; is cost effective; is feasible; and satisfies the purpose of flood risk reduction.

Specific features of the Recommended Plan include the following:

- Removal and replacement of the existing lava rock wall where it is severely deteriorated (approximately 0.6 miles).
- Repair of the wall in the reach upstream of Oregon Street, (approximately .3 miles) where the existing wall is generally in good condition. Repair could include concrete patches or reconstruction of the existing wall, or replacement of the wall, depending upon the severity of the deterioration.
- Replacement of five vehicular bridges (Nevada, Idaho, Montana, Wyoming, and Oregon Streets). The Main Street bridge does not cause channel constriction and will not be replaced.
- Replacement of three pedestrian bridges (two located between Nevada and Idaho Streets, and one between Main and Montana Streets). The pedestrian bridges will be updated to American with Disabilities Act standards.

This alternative would require mitigation measures, to include the development of a kiosk incorporating one of the memorial plaques found on the historic bridges (additional plaques will be turned over to the Idaho State Historical Society), an inventory of related historic structures within a section of downtown Gooding, and the inventory of historic lava stone features similar to the historic lava stone channel. These mitigation activities would be completed under the terms of the Memorandum of Agreement (MOA) with the Idaho State Historic Preservation Office (SHPO), within five years of the date it is executed. The MOA is included in Appendix L.

The USACE Project Delivery Team (PDT), a team comprised of subject matter experts, analyzed four different methods of construction to optimize the Recommended Plan. The PDT evaluated varied wall construction methods and their associated costs to identify the least-cost method for reconstruction of the canal walls where reconstruction is warranted. In locations where repair is appropriate (primarily in the upstream reach), concrete patch, consistent with repair in other locations, is the most likely method of

repair. To avoid substantial real estate and other LERRD costs, changes to the channel footprint were not evaluated.

As part of the environmental effects analysis, 16 environmental resources were identified as important to this project. However, only water quality, wildlife, fisheries, and aquatic resources, and threatened and endangered species, environmental justice, cultural resources, and cumulative effects were ultimately identified as needing further assessment, including consultation and/or coordination with other Federal, state, and tribal entities. The only unavoidable “Adverse Effect” if the Recommended Plan (Alternative 4) were implemented falls under Section 106 of the National Historic Preservation Act. USACE and the SHPO developed a MOA to address project impacts to historic properties, (Appendix L). Design of the constructed mitigation measure would be accomplished during the design and implementation phase.

In accordance with the National Environmental Policy Act (NEPA), this ILR/EA was developed to determine if implementation of the Recommended Plan (Alternative 4) would affect the quality of the human environment and whether an Environmental Impact Statement was required. However, based on the technical aspects of the project, best scientific information available, the analysis contained in this ILR/EA, and public comments, the USACE Walla Walla District Commander has determined that the proposed rehabilitation of the Gooding Canal would not significantly affect the quality of the human environment and an Environmental Impact Statement is not required.

The total project first cost is estimated to be $36.8 million (FY24 price level), and the average annual cost is estimated to be $1.39 million (FY24 price level and Federal discount rate of 2.75 percent). The fully funded project cost inflated to the midpoint of construction, including spent costs, is estimated to be $38.7 million.

LITTLE WOOD RIVER, GOODING, IDAHO
INTEGRATED LETTER REPORT
AND ENVIRONMENTAL ASSESSMENT

CONTENTS

TABLES

FIGURES

APPENDICES

ACRONYMS AND ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation
ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effect
ASA (CW)	Assistant Secretary of the Army for Civil Works
BCR	Benefit-Cost Ratio
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BMP	Best Management Practices
CAA	Clean Air Act
CAP	Continuing Authorities Program
CCC	Civilian Conservation Corps
CEJST	Climate and Economic Justice Screening Tool
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
City	City of Gooding, Idaho (Non-Federal Sponsor)
CMU	concrete masonry unit
CWA	Clean Water Act
EA	Environmental Assessment
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
EO	Executive Order
ER	Engineer Regulation
ESA	Endangered Species Act
FCSA	Feasibility Cost Sharing Agreement
FEMA	Federal Emergency Management Agency
FIS	Flood Insurance Study
FONSI	Finding of No Significant Impact
FRM	Flood Risk Management
FWCA	Fish and Wildlife Coordination Act
GHG	greenhouse gas
ICRIS	Idaho Cultural Resources Information System
IDEQ	Idaho Department of Environmental Quality
IDFG	Idaho Department of Fish and Game
LERRDS	Land, Easements, Rights-of-Way, Relocation, and Disposal areas
MBTA	Migratory Bird Treaty Act
MCACES	Micro-Computer Aided Cost Estimating System
MOA	Memorandum of Agreement
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NAAQS	National Ambient Air Quality Standards

NEPA	National Environmental Policy Act
NED	National Economic Development
NER	National Ecosystem Restoration
NFS	Non-Federal Sponsor
NHPA	National Historic Preservation Act
NMFS	National Oceanic and Atmospheric Administration, National Marine Fisheries Service
NRHP	National Register of Historic Places
NWP	Nationwide Permit
NWW	U.S. Army Corps of Engineers, Walla Walla District
O&M	Operations and Maintenance
OMRR&R	Operation and Maintenance, Repair, Replacement, and Rehabilitation
P&G	Principles & Guidelines for Water and Related Land Resources Implementation Studies
PDT	Project Delivery Team
PL	Public Law
RIT	Regional Implementation Team
SHPO	State Historic Preservation Officer
SOI	Secretary of the Interior
THPO	Tribal Historic Preservation Officer
TMDL	Total Maximum Daily Load
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WOTUS	Waters of the United States
WPA	Work Projects Administration
WRDA	Water Resources Development Act
WSEL	water surface elevation

SECTION 1 - INTRODUCTION

1.1 INTRODUCTION

The U.S. Army Corps of Engineers (USACE) developed this Little Wood River, Gooding, Idaho, Integrated Letter Report and Environmental Assessment (ILR/EA) for the purposes of determining whether the rehabilitation of the Gooding Canal is required as a result of improper operation and maintenance (O&M) by the Non-Federal Sponsor (NFS), and, if not, to determine the feasibility of rehabilitation or redesign of the channel, to potentially include bridge reconstruction or replacement, for flood risk reduction and ecosystem restoration. This ILR/EA recommends the most cost-effective solution and includes environmental compliance documentation to meet requirements of the National Environmental Policy Act (NEPA) of 1969, as amended.

The first $100,000 of this study was undertaken at full Federal expense. In August 2011, a Feasibility Cost Share Agreement (FCSA) was executed, allowing another $100,000 for the study to be cost-shared at 50 percent Federal and 50 percent non-Federal. In May 2023, an amendment was executed authorizing another $100,000 to the study to be cost-shared at 90 percent Federal and 10 percent non-Federal.

1.2 U.S. ARMY CORPS OF ENGINEERS PLANNING PROCESS

This ILR/EA is an integrated document that describes both the USACE Six Step Planning Process and includes an Environmental Assessment (EA) that serves to satisfy documentation requirements of NEPA, as amended, and other applicable laws. Table 1-1 provides a crosswalk between the NEPA process and the ILR/EA format. Section 2 specifically addresses the O&M concerns described in the project's authorizing language.

Table 1-1. Crosswalk between the Letter Report Format and NEPA Format

Report Section	NEPA Format
Introduction (Section 1)	Introduction/Background
Purpose and Need (Section 1.6), Problems and Opportunities (Section 1.7), Objectives (Section 1.8.1), and Constraints (Section 1.8.2)	Purpose and Need Statement
Formulation of the Arrays of Alternatives (Sections 4.3)	Description of Alternatives
Objectives (Section 1.8.1), Constraints (Section 1.8.2), and Principles and Guidelines Criteria (4.3.2)	Screening Criteria
Existing and Future without-Project Condition (Section 3)	Affected Environment
Environment Effects (Section 5)	Environmental Consequences (including Cumulative impacts)
Recommended Plan (Section 6)	Preferred Alternative

Report Section	NEPA Format
Public Involvement (Section 7.2), Agency Coordination (Section 7.24), and Tribal Consultation (Section 7.25)	Agencies/Public Coordination
Compliance with Applicable Environmental Laws, Regulations, and Executive Orders (Section 7.1)	Compliance with Other Laws

1.3 STUDY AUTHORITY

This ILR/EA was prepared under authority of Section 3057 of the Water Resources Development Act (WRDA) of 2007 – Little Wood River, Gooding, Idaho, which reads:

> SECTION 3057. LITTLE WOOD RIVER, GOODING, IDAHO.
>
> "(a) IN GENERAL.-The project for flood control, Gooding, Idaho, constructed under the emergency conservation work program established under the Act of March 31, 1933 (16 U.S.C. 585 et seq.), is modified-
>
> (1) to direct the Secretary to rehabilitate the Gooding Canal project for the purposes of flood control and ecosystem restoration if the Secretary determines that such rehabilitation is not required as a result of improper operation and maintenance of the project by the non-Federal interest and that the rehabilitation and ecosystem restoration is feasible; and
>
> (2) to direct the Secretary to plan, design, and construct the project at a total cost of $9,000,000.
>
> (b) COST SHARING.-
>
> (1) IN GENERAL.-Costs for reconstruction of a project under this section shall be shared by the Secretary and the non-Federal interest in the same percentages as the costs of construction of the original project were shared.
>
> (2) OPERATION, MAINTENANCE, AND REPAIR COSTS.-The costs of operation, maintenance, repair, and rehabilitation of a project carried out under this section shall be a non-Federal responsibility.
>
> (c) ECONOMIC JUSTIFICATION.-Reconstruction efforts and activities carried out under this section shall not require economic justification."

Implementation guidance for Section 3057 of WRDA 2007 directed USACE, Walla Walla District to prepare a decision document to determine whether the rehabilitation is required as a result of improper O&M by the NFS, and, if not, whether rehabilitation and ecosystem restoration is feasible. Economic justification of rehabilitation efforts completed under this provision is not required. The complete implementation guidance is contained in Appendix A.

Additional legislation passed in Section 8335 of WRDA 2022 raised the authorized cost from $9 million to $40 million and changed the cost share percentages for the project so that the NFS pays 10 percent of the costs to finalize the letter report and construct the project, while USACE will pay 90 percent of those costs. Section 8335 of WRDA 2022 also allows the reconstruction or replacement of bridges, typically a NFS responsibility, to be cost shared at the 90 percent/10 percent split. In addition, the NFS is to be provided the opportunity to finance construction costs over 30 years.

Pending ILR/EA approval and appropriation of funds, the design and construction of any Recommended Plan/Preferred Alternative will be initiated and conducted under a Project Partnership Agreement. Project implementation costs will be cost shared as indicated in Section 8335 of WRDA 2022, described above, except for the costs for lands, easements, rights-of-way, relocations, and disposal areas (LERRDs) and future operation, maintenance, repair, replacement, and rehabilitation (OMRR&R). These costs are the responsibility of the NFS.

In order to ensure against cost overruns, Section 902 of WRDA 1986 defines the maximum amount that a project may cost, which is referred to as the 902 limit. The 902 limit is calculated to be $51.6 million (FY24 price level). More detail regarding the 902 limit can be found in Section 6.6.

1.4 STUDY AREA

The study area is the Little Wood River corridor through Gooding, Idaho. Gooding is located in south central Idaho, 98 miles east of Boise, and 33 miles north of Twin Falls. The city population is estimated to be 3,625 (U.S. Census Bureau, 2021 American Community Survey 5-Year Estimate), and Gooding is the county seat of Gooding County. The city is located near the confluence of the Big Wood River and the Little Wood River, which merge a short distance downstream to form the Malad River, a tributary to the Snake River (Figure 1-1).

The Little Wood River channel through Gooding is also known as the Gooding Canal. The Little Wood River is the primary source of irrigation water in the area, and the flow is regulated by reservoirs and affected by diversions of water into and return flows from irrigation canals.

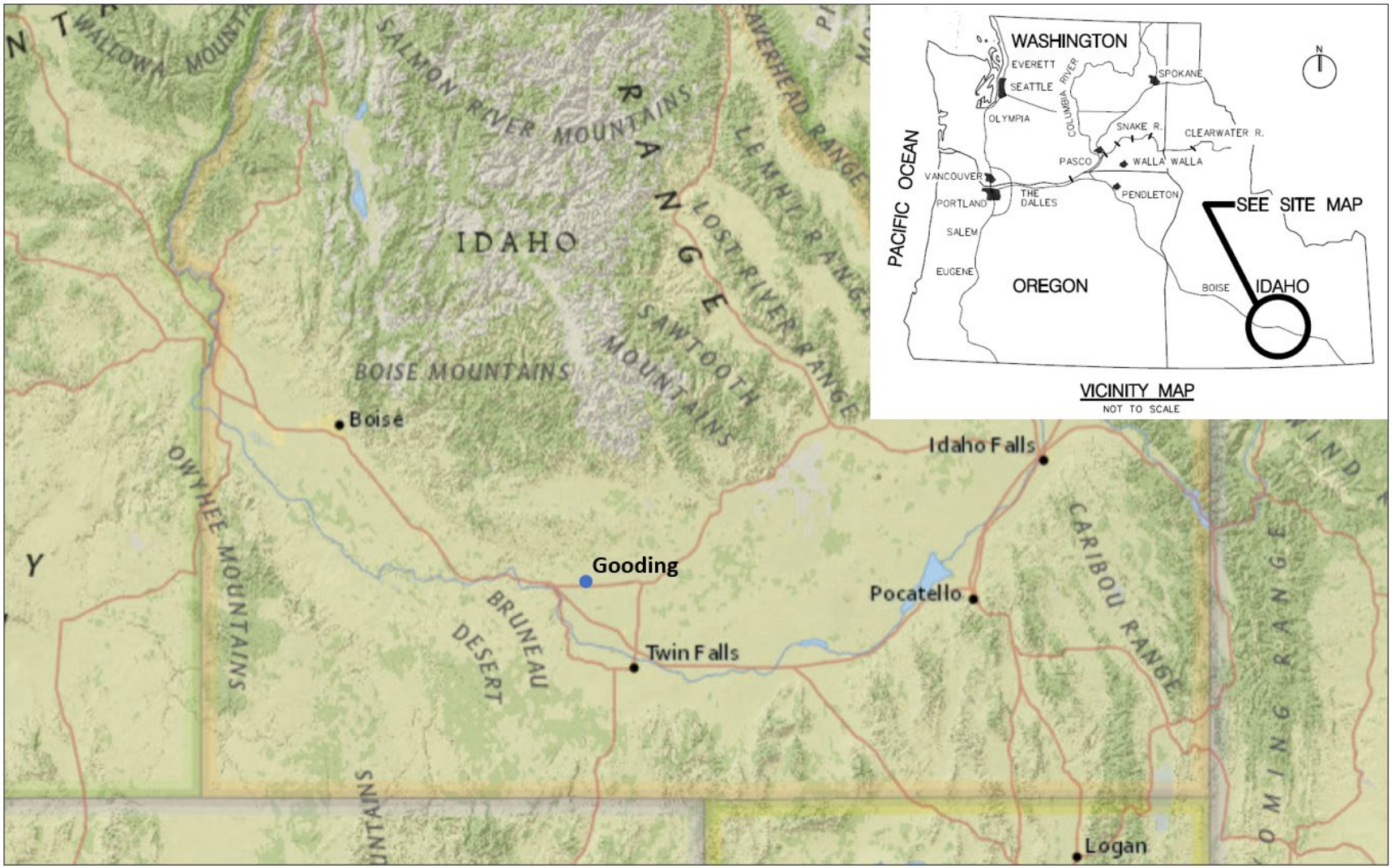

Figure 1-1. Location Map, Gooding, Idaho

Figure 1-2. Gooding Canal

1.5 BACKGROUND AND HISTORY

Construction of the Gooding Canal was originally funded under the emergency conservation work program, established under the Act of March 31, 1933 (Unemployment Relief Act) [Public Law 73-5, 48 STAT 22)], which provided the relief of unemployment through the performance of useful public work. Construction began in 1937. The river through town was realigned and the canal was completed in 1941. The Gooding Canal includes five vehicular bridge crossings and three pedestrian footbridges. The canal has a history of flooding caused by winter ice jams and spring high flow events (Figures 1-3 and 1-4). It has an accepted capacity of 580 cubic feet per second (cfs), accounting for 25 percent ice blockage and 1 foot of freeboard[1] under the bridges. During high flows in the winters of 1962 and 1963, ice jamming reduced the channel capacity to a low of 200 cfs. The channel is generally straight, but several 90-degree bends and reduced channel capacity caused by the existing bridge design may result in ice jams. Over the years, the channel wall has failed in multiple sections because the original construction methods used created a channel that cannot withstand freeze/thaw action and ice jamming.

[1] Freeboard is the distance between a free water surface and the top of a channel bank or the low chord of a bridge.

Figure 1-3. High Winter Flows in the Gooding Canal, 1962

Figure 1-4. Ice Jams within the Gooding Canal during the 1962 Floods

Facilities

- **The Gooding Canal**

  The Little Wood River flows through the existing Gooding Canal, which begins upstream at a diversion control structure and runs 0.89 miles, stretching from the east side of town at Kansas Street to the west end of town at Nevada Street.

  The Gooding Canal flows into the North Side Canal, also locally called Clover Creek, 0.3 miles downstream of the project area. Clover Creek runs in a native material channel, is not protected by the lava rock wall, and is not included in the project area. The canal is operated and maintained for the purposes of flood risk reduction and water supply for irrigation.

- **The Gooding Safetyway**

  The Gooding Safetyway is a canal located north of the city used primarily for irrigation diversion. It can also be is used to divert water away from the town of Gooding in high water events. The Safetyway is operated at the discretion of the City Manager. There are no measuring devices on the system, and there is no identified flow diversion trigger or target.

- **Irrigation**

  The Gooding Canal provides irrigation water to 76 water rights users, including a canal company, and irrigates hundreds of acres of farmland in the region. The water is diverted above and below the channel through town by a series of concrete structures and hydraulic gates.

1.5.1 Previous Studies – Rehabilitation of the Gooding Canal

The City of Gooding has sought assistance for canal rehabilitation in the past. Several studies, as well as clearing and snagging projects, have been completed in the area by USACE and other agencies. A brief history of USACE studies is summarized in the following paragraphs.

A Continuing Authorities Program (CAP) Section 14 study was initiated in March 1998. The scope of the CAP study was limited to a 120-foot section of wall adjacent to North Valley Academy, a charter school. A reinforced concrete wall with a textured surface was proposed for this project. The project was not approved at that time because of concerns from the Idaho State Historic Preservation Office (SHPO). The NFS and the SHPO met in January 1999 to negotiate an acceptable repair for the wall. They agreed on construction of a reinforced concrete wall, with the understanding that, at a later date, the City would install a rock façade to resemble the existing lava rock walls offsite.

Soon after, Section 416 of WRDA 1999 authorized canal rehabilitation. This legislation authorized the Secretary to "... conduct a study to determine the feasibility of restoring and repairing the Lava Rock Little Wood River Containment System to prevent flooding in the city of Gooding, Idaho." Once the NFS was aware of this authorization, they concluded that the smaller streambank stabilization project may be incompatible with a

comprehensive plan to restore/replace the entire structure, and the Section 14 project that started in 1998 was terminated.

The Section 905(b) Report (Reconnaissance), completed in July 2000 (Appendix B), found Federal Interest in the canal rehabilitation and included an estimated benefit-cost ratio (BCR) of 1.8 for flood risk benefits. A Feasibility Cost Sharing Agreement (FCSA) was signed but later terminated because the NFS could not meet its cost share requirements. Subsequently, the project was reauthorized under Section 3057 of WRDA 2007, which directed the Secretary to rehabilitate the Gooding Canal, as previously described in Section 1.3.

1.5.2 Previous Studies – Regional Flood Risk Studies

The City of Gooding has sought regional flood risk reduction assistance from USACE in the past, dating back as far as 1949. Previous USACE flood risk reduction studies are summarized in the following paragraphs.

- A study was initiated under the authority of Section 205 of the Flood Control Act of 1948 [Public Law (PL) 80-858], as amended, for flood control improvements for flood reduction in the cities of Gooding and Shoshone (upstream). Studies were terminated because estimated costs for a Recommended Plan exceeded the limits of the authority.
- The “Small Flood Control Project, Big Wood and Little Wood Rivers, Richfield-Gooding, Idaho - Reconnaissance Report” (USACE 1965) was prepared under the authority cited in paragraph 8 of Engineer Regulation (ER) 1165-2-102 (Local Cooperation) (USACE 1999). The plan of improvement in this Report would have diverted water from the Dietrich Canal (east of Richfield) into the lava beds outside of town by improving the present canal for a short distance and building a diversion structure. The Leabo Diversion site would also divert a sizeable share of flood waters to the lava beds. Construction would have consisted of a short length of channel excavation and construction of a minor diversion structure. The project was terminated because the scope and costs of the proposed actions exceeded available NFS resources.
- The "Big Wood River and Tributaries, Idaho – Feasibility Report for Flood Damage Reduction in the Vicinity of Gooding-Shoshone" (USACE 1976) recommended two flood control projects to divert flood waters from the Little Wood River into adjacent lava fields to the north (between the Big and Little Wood Rivers) via the existing Dietrich and Milner-Gooding irrigation canals. The Little Wood River Project was authorized for construction by Section 401(a) of WRDA 1986 (PL 99-662). However, it was later terminated because: (1) Despite high BCRs, the boundaries of the 100-year floodplains defined by the Federal Emergency Management Agency (FEMA) flood insurance maps could not be reduced; and (2) the NFS did not have the financial capability to cost share the project.

No other existing programs, projects, or studies affect the Gooding Canal or will be affected by the proposed action of this study.

1.6 PURPOSE AND NEED

The purpose of the proposed project (rehabilitation of the Gooding Canal portion of the Little Wood River through Gooding, Idaho) is to provide localized flood risk management. The Gooding Canal was constructed in 1941 for the purposes of flood risk management and providing irrigation water for the city of Gooding, Idaho. Construction of the Gooding Canal altered the natural alignment of the Little Wood River and associated riparian vegetation. The channel walls were constructed of both lava rock, some grouted, and some carefully fit together and left ungrouted.

The proposed project is needed because the channel is failing in areas due to age, the original construction method, channel configuration, and natural forces (ice, freeze/thaw, and heaving) all of which exert pressure on the individual stones that form the channel walls. To continue to provide localized flood risk management, the walls must be rehabilitated or replaced, and obstructions that constrict channel capacity must be removed or redesigned. The existing channel puts public infrastructure, including a school, at risk of damage due to localized flooding. The creation of the Gooding Canal, including channel realignment, also resulted in the removal of riparian vegetation. This has contributed to poor water quality and negatively impacted aquatic habitat over time.

The purpose of this ILR/EA, in accordance with Section 3057 of WRDA 2007, is to determine whether rehabilitation of the Gooding Canal is feasible so long as the need does not result from improper O&M by the NFS (the City of Gooding, Idaho). This ILR/EA describes the flooding, ecosystem, and related water resource problems and opportunities associated with the Gooding Canal and expresses desired changes as planning objectives. Measures and alternatives for meeting the objectives are presented, including a plan of no action. Alternatives also must (1) reduce risk from wall failure and ice jams, (2) improve reliability and conveyance, (3) avoid negative impacts to water rights, and (4) be within scope and cost limits. The economic, social, and environmental effects of the alternatives are described in qualitative detail, and a feasible plan is recommended for implementation. Alternatives considered must (1) satisfy the purpose and need for the project, (2) meet the planning objectives (Section 1.8.1), and (3) not violate the planning constraints (Section 1.8.2).

1.7 PROBLEMS AND OPPORTUNITIES

1.7.1 Problems

As described above, the existing Gooding Canal was constructed in the late 1930s and early 1940s. Construction altered the natural ecological conditions and realigned the river, creating sharp angles and bends in some locations. The original construction method, hand-stacked stone (grouted and ungrouted), is susceptible to weathering and other natural conditions and not sustainable over time. In the past 80 years, the lava rock walls have begun to fail, making the channel walls susceptible to erosion and undermining adjacent wall, sidewalk, and road surfaces. The five vehicular bridge crossings add to the flood risk by reducing conveyance and creating pinch points that reduce the overall channel width and provide surfaces for ice jams to form. The threat of

ice jams is compounded in locations of the river where the altered alignment has created sharp angles. The problems are summarized below:

- The existing Gooding Canal is failing due to outdated construction methods. These failures increase flood risk to the people and property in Gooding, Idaho.
- In locations where the wall is failing or has failed, the risk of erosion is increased, placing the adjacent wall sections, road, and sidewalk surfaces at risk of slumping and failure from erosion and increasing the risk to public safety.
- Undersized bridge crossings contribute to flood risk by reducing conveyance capacity and providing surfaces for ice jams to form.

The following paragraphs provide an explanation of these problems:

Problem: Outdated construction methods (stacked rock walls, with inconsistent grouting) contribute to channel wall failure and increase risk of localized flooding in Gooding.

Wall failures caused by failed grout and erosion increase the potential for localized flooding and property damage along the Gooding Canal. As the walls fail, soils behind the wall are exposed to river flows and erode. As soils along the toe of the walls fail and can no longer support the soil above (Figure 1-5), sections of wall collapse into the channel and cause damage to adjacent private property and city infrastructure (e.g., roads, pipes, fences, etc.).

Figure 1-5. Failing Walls Contributed to Damage to Adjacent Infrastructure

Figure 1-6. Collapsed Wall Sections and Failed Attempts to Stabilize with Concrete Caps

Problem: Decreased channel reliability and conveyance. Erosion and slumping undermine the reliability of the channel, resulting in increased risk of channel wall failure, high potential for ice jams and ice damming, and an increased risk of localized, out of channel flooding in Gooding.

As the lava rock walls deteriorate with age, they slump into the channel bed, creating obstructions and reducing the cross-sectional area available to convey water. These piles of rock and debris increase the roughness of the channel and cause abrupt changes in the flow lines along the wall, further reducing conveyance capacity. The limited capacity of the channel where walls have failed can result in localized flooding as water is forced up and out of the river channel during high flows (Figure 1-6).

Ice jams are a common annual occurrence in Gooding and often result in localized flooding. Ice jams are created when ice flows downstream through the canal and builds up on slumped sections of the channel wall or bridge abutments. The Gooding Canal is a rectangular channel, lined on both sides with lava rock. Every bridge crossing the canal is like a concrete box culvert. The interior edges of each bridge abutment protrude into the channel by approximately 2 feet, causing a reduction of up to 4 feet in the overall width of the channel in those locations. The abrupt edges of the bridge abutments also provide a location for ice to build up, potentially leading to ice jams. Typically, localized flood events occur each winter. However, given the relatively limited capacity of the Gooding Canal, extreme weather events (high flows caused by snowmelt or heavy rain) combined with ice jams may lead to more significant and widespread winter floods.

Ice jams caused significant winter flooding in Gooding ten times between 1910 and 1983. In the winter of 2011-2012, multiple small ice jams formed, even though temperatures were relatively mild in the area and river flows were minimal. Examples of ice jams are depicted in Figures 1-7 and 1-8.

Figure 1-7. Ice Jam Upstream of Nevada Street Bridge
Water escaped the channel and caused localized flooding in the city park.

Figure 1-8. Ice Jam Upstream of Nevada Street Bridge
Ice removed from the channel by City Public Works is visible on the left.

Problem: Undersized bridge crossings contribute to flood risk by reducing conveyance capacity and providing surfaces for ice jams to form.

Undersized bridge crossings are a direct result of the way the bridges were initially built, as the bridge abutments encroach about 2 feet into the channel on both sides. This not only impinges flow, but the abutments provide areas for ice to accumulate and clog the channel. Figures 1-9 and 1-10 shows how the bridge abutments restrict flows within the Gooding Canal (see also Figure 1-5). Figure 1-11 is an example of the failing canal walls.

Figure 1-9. Bridge Abutment Example in Gooding Canal

Figure 1-10. Typical Section of the Gooding Canal with Stones Sloughing into Channel

Figure 1-11. Failing Walls Slough into the Canal

1.7.2 Opportunities

Opportunities associated with the Gooding Canal include the potential for reduced maintenance effort and cost, increased public safety, and historical interpretation. Specific opportunities addressed in this study include the following:

- Reduce future costs of channel maintenance.
- Interpret the historical significance of the lava rock-lined channel and vehicle bridges.

The following paragraphs contain additional details regarding potential opportunities within the project footprint.

Opportunity: Reduce channel maintenance.

Repair and maintenance of the existing stone wall requires time-consuming and expensive hand maintenance. Rehabilitating the wall using more durable materials and methods would significantly reduce maintenance requirements and extend the useful life of the canal.

Opportunity: Interpretation of the historic lava rock canal and vehicular bridges.

The existing lava rock canal and concrete vehicular bridges have been determined eligible for listing on the National Register of Historic Places (NRHP) because of age and association with the Works Progress Administration—which was changed to Work Projects Administration (WPA) in 1939—and Civilian Conservation Corps (CCC). The lava rock walls no longer provide reliable flood protection, but the historic significance of the channel and bridges, associated with the important mid-20th century WPA/CCC programs, should be interpreted, and additional resources within the area will be recorded to further expand on the knowledge base associated with the construction method and period of significance of the historic channel and bridges.

Planning Considerations

Public Safety

In some locations, parapet walls along the Gooding Canal extend above ground level and have a steep vertical drop directly to the channel bottom. The walls are approximately 3 feet tall. They are low enough that a person could fall into the river, but tall enough to prevent a person trapped in the canal from being able to exit. As the river channel is rehabilitated, provisions can be included to improve safety by reducing access to the river channel in areas with vertical walls, by providing exits, or by making the interface between the community and the river less hazardous.

1.8 PLANNING OBJECTIVES AND CONSTRAINTS

1.8.1 Planning Objectives

Planning objectives are statements of the desired outcome of the study effort. These planning objectives are designed to respond to stated problems to achieve the desired future conditions.

The planning objectives for this ILR/EA are as follows:

- Reduce local flood risk and damages that would result from channel wall failure and ice jams along the Gooding Canal over the next 50 years.
- Improve long-term channel reliability and conveyance of the Gooding Canal over the next 50 years.

1.8.2 Planning Constraints

Unlike planning objectives that represent desired positive changes, planning constraints represent restrictions that could limit the range of actions to be considered. Planning constraints identified in this study include the following:

- Avoid negative impacts to existing water rights holders and water users (including impediments at points of diversion and delivery).

SECTION 2 - CHANNEL OPERATION AND MAINTENANCE

2.1 GENERAL

The Gooding Canal rehabilitation authorization provided by Section 3057 of WRDA 2007 requires "…the Secretary [to] determine that such rehabilitation [of the Gooding Canal] is not required as a result of improper operation and maintenance of the project by the non-Federal interest." Section 2 specifically addresses this requirement.

2.1.1 Data Collection

Gooding, Idaho, is a small community with limited resources to document and maintain records of all maintenance and repair activities associated with canal O&M over 80 years. The City has not been able to locate long-term historic documentation for the work it performed to maintain the canal. Because of the lack of available information, the Project Delivery Team (PDT) conducted field inspections and interviews with NFS staff to develop an understanding of past and current efforts to maintain and operate the Gooding Canal as a flood protection structure.

2.1.2 Original Channel Construction

The Gooding Canal was funded by the WPA and constructed by the CCC during the 1930s. It was constructed by masons and laborers and was not designed by engineers. The canal is constructed with excavated, near vertical slopes covered with hand-placed lava rock, positioned directly onto the naturally occurring basalt channel bottom. The majority of the hand-stacked stone construction is held together with a cement-sand grout, which is highly susceptible to physical and chemical weathering. Field investigations revealed multiple problems with grouting of the channel walls. Along a 0.22-mile stretch of the original channel wall on the right bank (looking downstream) and a 0.14-mile stretch on the left bank, the canal wall is constructed of stacked, ungrouted stones (Figure 2-1) and relies solely on the weight of the rocks to keep the wall intact. Other sections have very limited and/or shallow grout (Figure 2-2), which can be found in original sections of wall along the entire channel length. Both conditions result in a lack of cohesion, which has accelerated the wall degradation and reduced its structural integrity by allowing water to infiltrate ungrouted wall voids, freeze and expand, and cause stones to break off into the canal. This makes the canal more susceptible to freeze/thaw- and ice shelf-related damages, including those resulting from ice jams, which are more likely to form along collapsed sections of the channel. Figure 2-3 shows one of the more intact sections of the Gooding Canal as it looks today.

Figure 2-1. A Section of the Channel Wall Constructed of Stacked, Ungrouted Rock

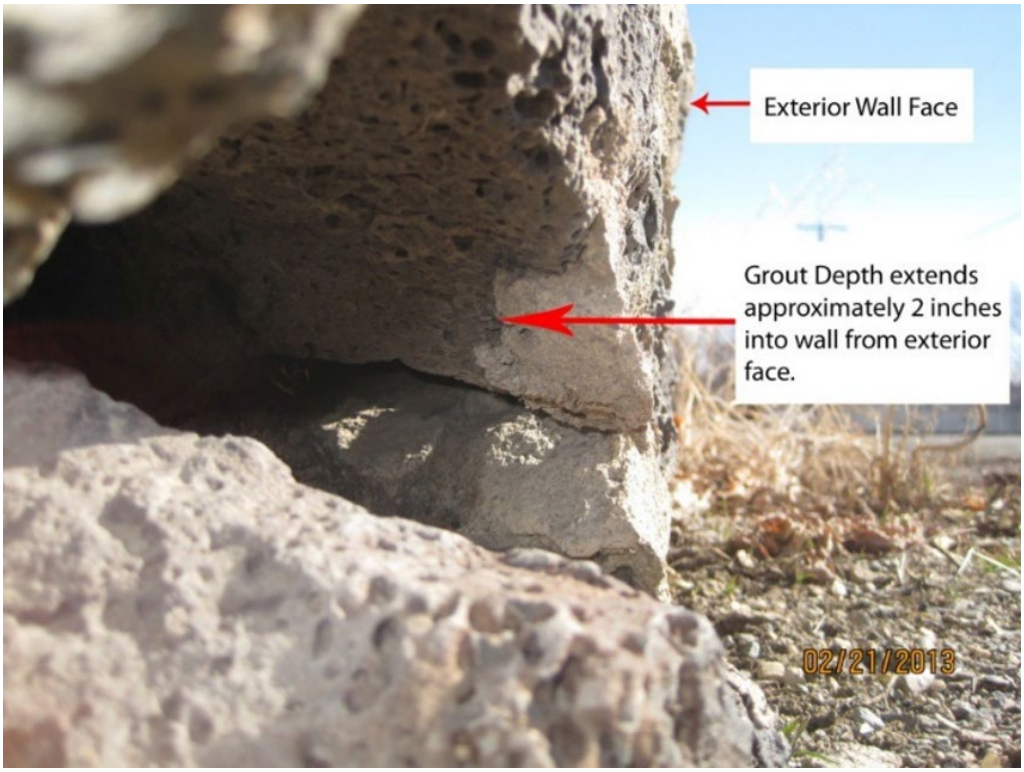

Figure 2-2. A Section of the Channel Wall Depicting Limited/Shallow Grout

Figure 2-3. One of the More Intact Sections of the Gooding Canal Operation and Maintenance

An O&M manual was not provided by the CCC when construction was completed, and the canal was turned over to the NFS. Instead, the NFS has established its own policies and procedures for OMRR&R.

2.1.3 Channel Operation

The Little Wood River flows year-round through the Gooding Canal, providing conveyance for both summer irrigation flows and spring flood releases. Spring flows are carefully monitored to ensure water does not rise above canal walls and flow into nearby neighborhoods. When flows become too high, water from the canal is diverted into the Gooding Safetyway and other canals at the Gooding Flood Canal diversion, which lies to the east of Gooding. Figure 2-4 shows possible flood diversions from Gooding Canal. During high winter flows, the channel is closely monitored for ice jams. Ice jams constrain flows, which causes localized flooding in the surrounding neighborhoods and creates significant maintenance issues for the NFS.

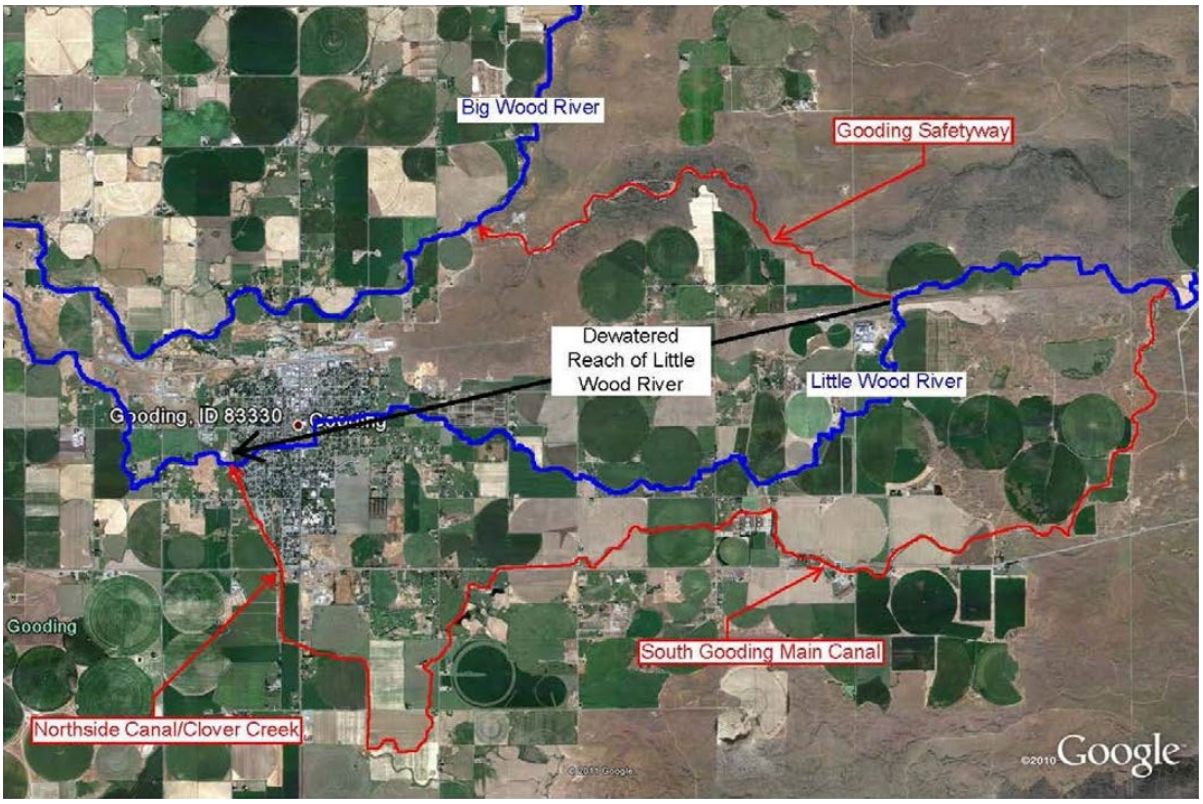

Figure 2-4. Possible Diversion Channels (red lines) to Dewater Gooding Canal

2.1.4 Channel Maintenance

Over the years, the NFS has replaced or repaired walls along many sections of the Gooding Canal in an effort to extend its effective life. Some repairs were obviously made early in the life of the canal, while others have been made more recently. Despite annual maintenance performed by the NFS, because of the construction materials and methods used, the channel is in poor condition and exhibits distress and damage along much of its overall length.

During interviews, maintenance staff reported problems that have resulted from the construction methods used for the canal. Sections of the wall without grouting or with only shallow grouting show accelerated deterioration and lack of structural integrity. The staff also described the frequency and methods of maintenance from 1970 to the present, from annual manual labor to total wall replacement in some areas.

In a letter written by the Gooding Public Works Director to Senator Mike Crapo, the NFS estimated O&M expenditures of approximately $20,000 per year over the last 25 years for the Gooding Canal. This amount included "…labor, equipment, and supplies needed to keep the wall together, keep the channel clear of debris, flood prevention, repair of roads along the channel from settling, installation of safety fencing and constant monitoring." Staff report public works expenditures for O&M of the canal prior to 1970, but the City has not maintained historic records of expenditures specific to the canal maintenance.

General Maintenance

Ice jams are an annual problem in the Gooding Canal (Figures 2-5), as well as in nearby areas (Figure 2-6). They constrict flows at the bridge abutments and put stress on the ungrouted rock walls of the channel, contributing to channel failure. This contributes to localized flooding adjacent to the channel by pushing water out of the canal.

Figure 2-5. Ice Jam Forming between the Nevada and Idaho Street Bridges

Figure 2-6. Ice Jam at Colorado Street, just downstream of the Canal

The ice also forms on intact sections of the canal walls due to the roughened wall surface, creating ice shelves. Once ice shelves are formed, they can cause outward force on the stones in the canal walls. This pressure can be strong enough to push stones from the wall into the canal (Figure 2-7).

Figure 2-7. Ice Shelf on the Channel Wall

Typically, if an ice jam is detected, the NFS has performed O&M efforts to minimize the risk of flooding. Prior to 1970, manual labor alone was used to minimize and eliminate ice jams within the canal each year. Between 1970 and the mid-1980s, the NFS hired a drag line and ice bucket ("snag and drag") to clear jams. During the mid-1980s, the NFS acquired its own ice removal equipment and continued "snag and drag" operations until the early 2000s, when they transitioned to a large backhoe that breaks up the ice mechanically. Without these proactive efforts, wall damage would be more severe and the local flood risk much higher.

Repair and Replacement

Numerous sections of wall along the Gooding Canal have been repaired or replaced by the NFS, but the frequency and extent of damage is accelerating. Visual inspection showed that many repairs have been completed to extend the life of the canal. Some of the earlier repairs on small sections of the walls were completed with stone and grout, or concrete. (Figures 2-8 and 2-9).

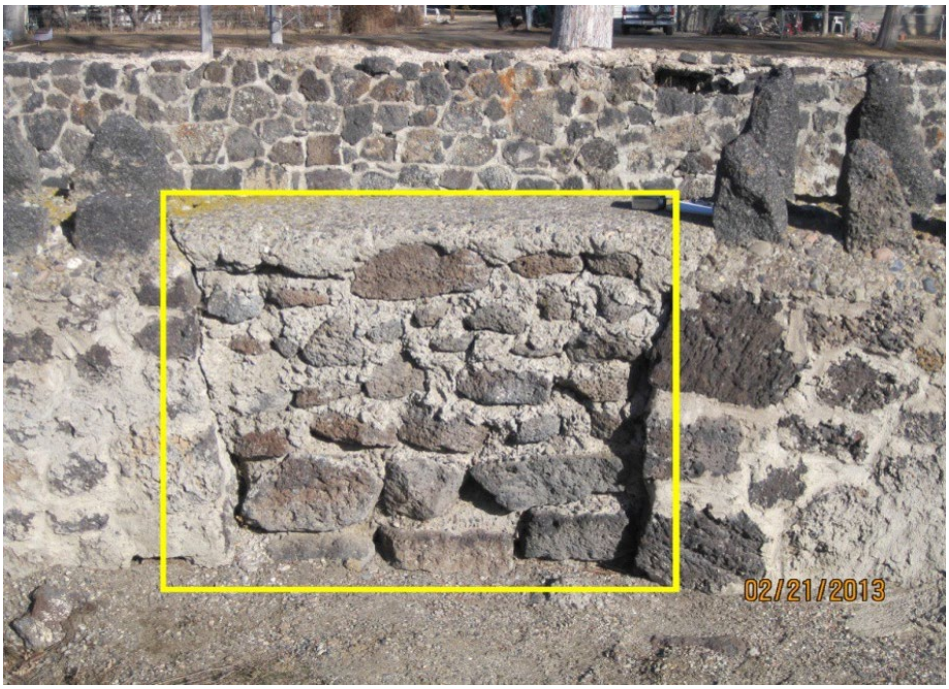

Figure 2-8. Repaired Section Utilizing Stone and Grout to Rebuild Parapet Wall

Figure 2-9. Concrete Used to Repair Channel Wall Section

In the late 1980s to early 1990s, the City replaced three sections of the canal wall, totaling 120 feet, with concrete vertical walls (Figures 2-10 and 2-11). Despite the site-specific efforts, the canal remains in poor condition, with distress and damage (as described above) visible along most of its length.

Figure 2-10. Concrete Wall Replacement (accomplished during the 1990s)

Figure 2-11. Concrete Wall Replacement (accomplished during the 1990s)

2.2 DETERMINATION OF OPERATION AND MAINTENANCE

Based on the results of field inspections and investigations of the entire length of the Gooding Canal, and interviews with long-time residents and City officials, the PDT determined that the accelerating deterioration rate of the canal is not the result of improper O&M by the NFS, and the canal has effectively reached the end of its useful life. Maintenance efforts and costs incurred for routine operations have increased over time and will continue to increase in the future. Maintenance needs will soon become so extensive that making isolated repairs to the canal walls will be impractical.

The fact that the Gooding Canal is still operating successfully after more than 80 years, despite the many repairs, supports the conclusion that the NFS has maintained the canal with due diligence. The PDT has determined that the NFS has put forth a conscientious effort to operate and maintain the Gooding Canal. The extra effort and cost to replace portions of the wall that were beyond repair indicates the deliberate responsibility taken by the NFS to care for the canal, above and beyond what is expected through “normal” maintenance. Therefore, it is determined that the need to rehabilitate the Gooding Canal is not due to lack of maintenance or negligence on the part of the NFS.

This finding fulfills the requirement that the Secretary determine that rehabilitation of the canal is not required as a result of improper O&M on the part of the non-Federal interest.

SECTION 3 - AFFECTED ENVIRONMENT/EXISTING AND FUTURE WITHOUT-PROJECT CONDITIONS

3.1 INVENTORY AND FORECAST OF RESOURCE CONDITIONS

Section 3 presents the existing conditions and a forecast of future conditions over the 50-year period of analysis. The forecast is known as the future without-project condition and is the baseline against which all alternative plans are compared. The environment described herein is general in nature and is intended to address site conditions for all aspects of rehabilitation of the channel walls, including staging and mobilization. This section represents the Affected Environment, as described under NEPA.

3.2 GENERAL SETTING

Gooding is located in south central Idaho at elevation 3,573 feet above sea level. The city is located near the confluence of the Big Wood River and the Little Wood River, which merge downstream of town to form the Malad River, a tributary of the Snake River. The climate is considered semi-arid. The city population is estimated to be 3,625 (U.S. Census Bureau, 2021 American Community Survey 5-Year Estimate), and Gooding is the county seat of Gooding County.

3.3 NATURAL ENVIRONMENT

3.3.1 Climate

The climate of the study area is generally semiarid in character with annual precipitation around 8 to 10 inches. The average temperatures during July are a low of 54 degrees Fahrenheit and a high of 90 degrees. For January, the average low is 18 degrees Fahrenheit with a high of 36 degrees. At the headwaters of the Little Wood River, in the foothills and mountains above Carey, Idaho, precipitation can be as high as 45 inches per year, and temperatures in these higher elevations may be much lower than those typical in the Gooding area. The prevailing winds blow from the west to southwest at 8 to 12 miles per hour. Winds in the area are common and exert a drying effect upon the landscape. Over the past century, most of the state of Idaho has warmed 1 to 2 degrees Fahrenheit. Snowpack is melting earlier in the year, and the flow of meltwater into streams during summer is declining (see Appendix J, Climate Change Assessment). In the coming decades, streams will be warmer, populations of several fish species may decline, wildfires may be more common, deserts may expand, and water may be less available for irrigation.

3.3.2 Vegetation

The native vegetation community in the region is shrub-steppe. This includes Blue Bunch Wheatgrass (*Agropyron spicatum*), Nevada Bluegrass (*Poa nevadensis*), Great Basin Wild Rye (*Leymus cinereus*), sod forming wheat grasses, Needle and Thread grass (*Hesperostipia comate*), Balsamroot (*Balsamorhiza sagittata*), Little Sunflower (*Helianthis pumilus*), Great Basin Sagebrush (*Artemesia tridentata*), and Low

Sagebrush (*Artemesia arbuscule*). Livestock grazing, agricultural cultivation, and other development have changed the native vegetative community and led to the establishment of cheat grass and other invasive species.

Riparian vegetation in the Gooding Canal reach was removed in conjunction with canal construction and residential development Single to small groups of trees or other vegetation can be found in limited locations along or adjacent to the canal, primarily associated with the city park (Gonzalez Park) or residential yards. The channel bottom is mostly bedrock, which limits conditions that support the growth of vegetation, and most of the adjacent land is dominated by paved roads or manicured lawns. Upstream of the Gooding Canal is a largely intact riparian corridor with vegetation typically composed of Willows (*Salix* sp.) and Black Cottonwoods (*Populus trichocarpa*).

Based on current information, it is likely that vegetation composition and density in the study area would remain relatively unchanged. The limited vegetation along or adjacent to the canal as it runs through the city of Gooding, and the riparian corridor upstream, is not expected to change without alteration of land ownership or land use policies along the canal.

3.3.3 Wildlife

The urbanized portion of the study area, including Gooding and the Gooding Canal, provides very little wildlife habitat. Big game animals are found within Gooding County, but outside of this area. Vegetation is only found in limited locations along or adjacent to the canal, primarily associated with the city park (Gonzalez Park) or residential yards, and these areas do not provide quality habitat for wildlife. The vertical canal walls make access to the water impossible for most wildlife. Improvements for wildlife in the study area are not likely to take place in the future due to the established urban community that surrounds the canal.

Upstream of the Gooding Canal, there is a riparian corridor within agricultural lands that likely supports some riparian associated wildlife species.

Table 3-1 identifies mammals documented in the area, but outside of the project footprint.

Table 3-1. Mammals Documented in the Region of Gooding, Idaho

Coyote	*Canis latrans*
Bobcat	*Lynx rufus*
Red Fox	*Vulpes*
Black Bear	*Ursus americanus*
Grey Wolf	*Canis lupus*
Cougar	*Puma concolor*
Mule Deer	*Odocoileushemionus*
Rocky Mountain Elk	*Cervus canadensis*
Pronghorn Antelope	*Antelopcapra americana*

Black-tailed Jack Rabbit	*Lepus californicus*
Pima (Pygmy) Rabbit	*Brachylagus idahoensis (Pygmy)*
Mountain Cottontail Rabbit	*Sylvilagus nuttallii*
Yellow-bellied Marmot	*Marmota flaviventris*
American Badger	*Taxidea taxus*
Raccoon	*Procyon lotor*
Long-tailed Weasel	*Mustela frenata*
Mink	*Neovison vison*
Muskrat	*Ondatra zibithicus*

In addition to mammals, many species of birds are documented in the region, but not necessarily within the project area. Game birds within the county include the Ring-necked Pheasant (*Phasianus colchicus*), Chukar (*Alectoris chukar*), Hungarian partridge (*Perdix perdix*), Greater sage grouse (Centrocercus urophasianus), California or valley quail, and mourning dove. The non-game birds of prey include hawks, falcons, golden eagles, occasionally bald eagles, great horned owls, burrowing owls, barn owls, kingfishers, pelicans, and possibly osprey. Other non-game birds include the Rufous Hummingbird (*Selasphorus rufus*), a bird of conservation concern that may breed in the region between April 15 and July 15 and could occupy the region as a migrant in August each year. The Greater Sage Grouse has been petitioned for listing under the Endangered Species Act (ESA, see Section 3.2.5 below), but the U. S. Fish and Wildlife Service (USFWS) has determined that listing is not warranted.

3.3.4 Fisheries and Aquatic Resources

The Little Wood River through Gooding has been dramatically altered from its natural alignment and is now an urbanized canal. Below Shoshone, Idaho (upstream of Gooding) aquatic habitat is poor, and this reach is managed by Idaho Department of Fish and Game (IDFG) as a warm water fishery, with smallmouth bass as the desired game species. The National Wetlands Inventory indicates that the Gooding Canal is riverine with two adjacent freshwater emergent wetlands (0.2 to 0.32 acres) potentially present. Site visits failed to confirm the presence of any functioning freshwater emergent wetland habitats. In the 5 miles upstream of Gooding, there are extended areas of freshwater forested/shrub wetland and one potential freshwater emergent wetland (0.36 acres). Wetland conditions can change over time.

During the period of analysis, these fish and habitat characteristics (i.e., warm water fisheries, poor aquatic habitat, and urbanization in the Gooding Canal reach) are likely to remain unchanged. Restoration of aquatic habitat along the Gooding Canal would require substantial alteration of the existing channel alignment and configuration, and a change in adjacent land uses.

3.3.5 Threatened and Endangered Species and Critical Habitat

USACE reviewed the current list of threatened and endangered species protected under the ESA and potentially found near the study area. Species under the jurisdiction of the

National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) and the USFWS were compiled and are shown in Table 3-2. Critical habitat is not designated or proposed for any of the ESA species potentially present.

Table 3-2. Species Possibly Present in the Area of Potential Effect

Species	Scientific Name	Status
NMFS		
Listed Species		
None		
USFWS		
Listed Species		
Banbury Springs Limpet	*Idaholanx fresti*	Endangered
Monarch Butterfly	*Danaus plexippus*	Candidate

A Biological Evaluation (BE) with a finding of "No Effect" to ESA-listed and candidate species was completed by USACE. The BE is available in Appendix G.

The Banbury Springs limpet is currently known to exist only in four cold water spring complexes along a 6-mile reach of the middle Snake River. These locations are 14 to 19 miles from Gooding, and the proposed action area lacks suitable habitat for this species. The candidate Monarch Butterfly might be found in the region, but the proposed action area lacks any suitable habitat for this species. No ESA-listed or candidate species is known to occur in the Little Wood River, and no designated or proposed critical habitat is present.

Under Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), Federal agencies are directed to consult with NMFS on all actions, or proposed actions, that may adversely affect Essential Fish Habitat (EFH). The Little Wood River is upstream of impassable dams on the Snake River in the Hells Canyon Complex, and there is no EFH present.

3.4 PHYSICAL ENVIRONMENT

3.4.1 Topography/Geology/Soils

The Gooding Canal is located 3,573 feet above sea level. Although the city of Gooding and immediate surroundings are relatively flat, the outlying area has elevations ranging from 3,200 feet on the plains to 5,000 feet in the foothills. The study area is located within the Snake River Plain, an area underlain by fractured basalt lava flows, rhyolite, and unconsolidated sediments. Deposits between the basalt layers are mainly sand, silt, and clay, with smaller amounts of volcanic ash.

The headwaters of the Little Wood River originate in a mountainous area with multiple peaks above 10,000 feet. Soils in the area are wind-laid silts over lake-laid sediments or basalt bedrock. The soil tends to have clay accumulations in the subsoil layers. These characteristics are expected to remain unchanged during the period of analysis.

3.4.2 Air Quality

The Clean Air Act of 1970, as amended, required the U.S. Environmental Protection Agency (EPA) to adopt national ambient air quality standards for priority pollutants. Those areas where pollutant levels do not exceed standards are in “attainment.” Gooding is in an attainment area.

There is very little air quality monitoring in the study area. Odors from dairies and feedlots are noticeable at times, depending on wind direction. Dust from agricultural operations is also present at specific times of the year. Similar characteristics can be expected over the entire period of analysis.

3.4.3 Water Quality

The Clean Water Act, Section 303(d), provides a framework to identify streams that are water quality limited and, as a result, do not meet their designated beneficial uses. The Little Wood River, from Richfield to its confluence with the Big Wood River, is listed by the Idaho Department of Environmental Quality (IDEQ) (IDEQ 2005) as impaired, or having poor water quality, primarily due to agricultural practices. Conditions that contribute to poor water quality in the Gooding Canal include high sediment, low nutrients, dissolved oxygen, channel alteration, and pathogens. During the period of analysis, it is not expected that existing water quality levels will change unless agricultural land use and grazing best management practices upstream of the canal are implemented.

3.4.4 Noise

The immediate study area is located in an urbanized setting. The Gooding Canal follows a road and crosses many other roads that run perpendicular to the river alignment, and vehicle noise is common. Because the city is a small rural community, the noise levels from vehicles are not excessive or constant but are the prevalent noise in the area. These characteristics are expected to remain unchanged during the period of analysis.

3.4.5 Agriculture/Prime and Unique Farmlands/Land Use/Staging areas

Most land within the study area is privately owned. Most of the land immediately adjacent to the Gooding Canal is residential, with a few small areas of commercial use, agricultural use, and one public park. Adequate staging areas needed to perform work on the canal, without developing new areas or adversely impacting natural resources are present throughout the project area. The Bureau of Land Management (BLM) is a large landowner in the region but does not own land within the project footprint. No prime and unique farmlands are designated in the area. These characteristics are expected to remain unchanged during the period of analysis.

3.4.6 Hydrology

The Little Wood River originates in the Pioneer Mountains, an easterly extension of the Sawtooth Range. The river flows south out of the mountains through the Little Wood

Reservoir, near Carey, then southwesterly toward Richfield. From there, it turns west and flows through Shoshone and Gooding. Downstream, the Malad River forms from the confluence of the Big and Little Wood Rivers, approximately 4 miles west of Gooding. The drainage area of the Little Wood River above Gooding is approximately 680 square miles (Figure 3-1).

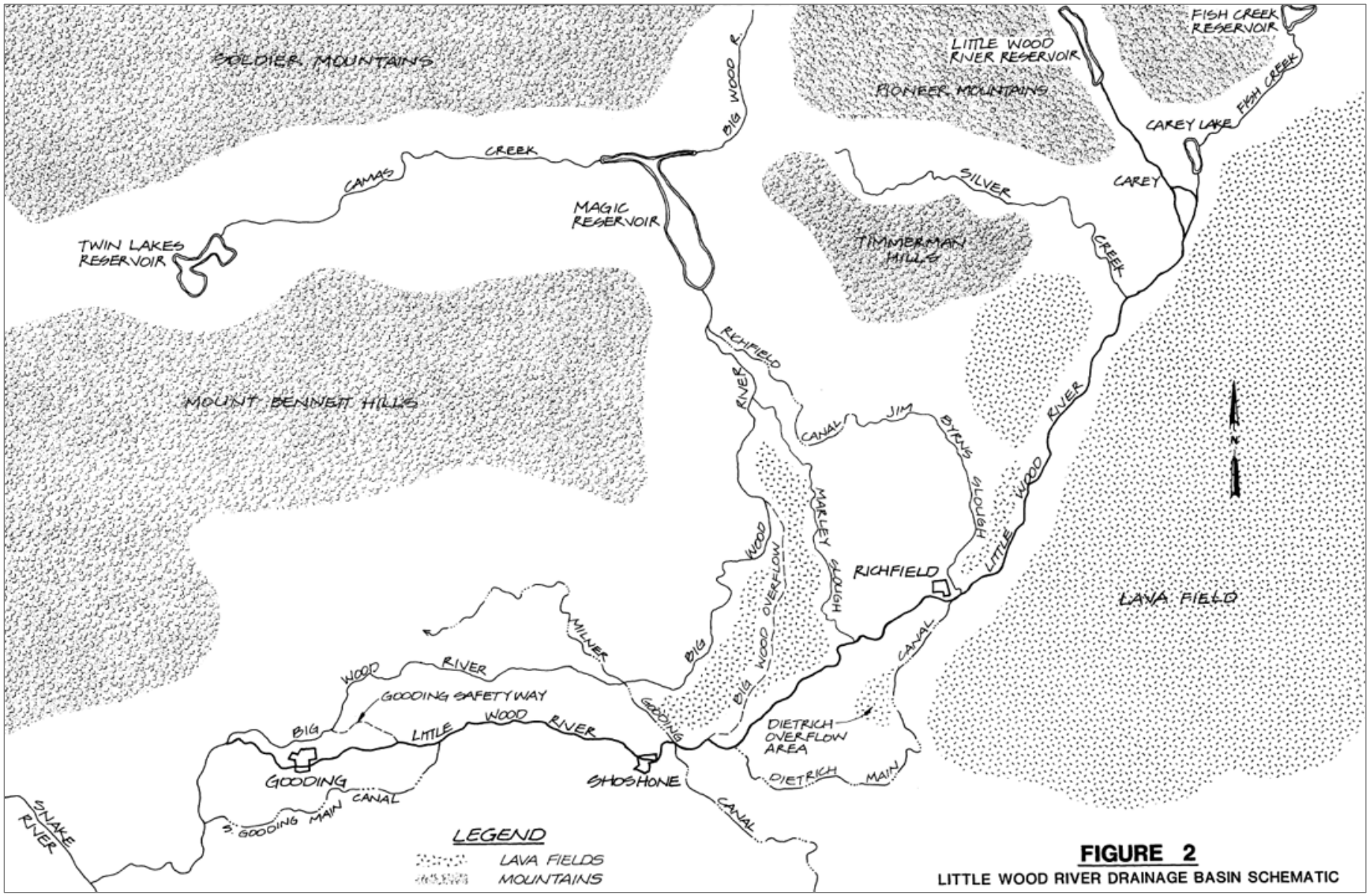

Figure 3-1. Wood River Valley

Source: (Federal Emergency Management Agency, 1985)

The natural flows of the Little Wood River are regulated by the Little Wood Reservoir, a 30,000-acre-foot reservoir located approximately 11 miles northwest of Carey, Idaho, upstream of Gooding. The reservoir is operated to provide winter and spring flood protection on the Little Wood River, as well as irrigation storage. The Fish Creek Reservoir on Fish Creek, a tributary to the Little Wood River, diverts water to irrigation projects, but also contributes to flows in the river.

The Little Wood River is interconnected with the Snake River and the Big Wood River through irrigation canals that divert from, and release water into, the Snake River. There is no streamgage that records flows through Gooding year-round. The nearest year-round gage on the Little Wood River (upstream of the Gooding Canal) was U.S. Geological Survey (USGS) Gage No. 13151500, Little Wood River at Shoshone, Idaho, which was operated from April 1922 until December 1959 (Table 3-3).

Table 3-3. Average Monthly Flows from USGS Gage No. 13151500, Little Wood River at Shoshone, Idaho, 1922 through 1959

Month	Flow (cfs)
October	63.62
November	106.01
December	133.53
January	122.82
February	145.28
March	150.39
April	196.24
May	380.26
June	399.94
July	381.05
August	353.15
September	281.83

Irrigation District 37M currently operates a streamgage on the Gooding Canal during the irrigation season (from April through September). USACE was provided with annual data from 2000 through 2010, which the Water Master indicates is a typical set of data and representative of an average decade (Table 3-4). The information in Tables 3-3 and 3-4 shows the difference from historic flows to the present, indicating significant irrigation withdrawals from the Little Wood River between Shoshone and the Gooding Canal, particularly in the summer months, as depicted by the low flow levels. Irrigation activities will continue in the region, removing water from the Gooding reach of the Little Wood River and redistributing it throughout the valley in accordance with state water law.

Table 3-4. Average Monthly Flows on the Gooding Canal from District 37M Gage, 2000 through 2010

Month	Flow (cfs)
April	117.49
May	80.12
June	70.00
July	70.60
August	69.02
September	80.56

The FEMA Flood Insurance Study (FIS) for the city of Gooding (Community Number 160064), dated June 19, 1985, describes the flood risk for Gooding as twofold. First, there is the risk of winter flooding due to ice jams, which has occurred 10 times between 1898 and 1985. These floods are often caused by an existing snowpack and frozen ground with a warmer rainstorm moving over the area, thereby creating a rain-on-snow event. High flows traveling down a river channel filled with ice can easily lead to ice jamming. These types of flood events tend to be more localized in nature and have not occurred on the Little Wood River in Gooding since 1985.

The second flood risk is from high spring runoff in the Little Wood Basin. There are several locations upstream of Gooding where water can be diverted during high flows or will percolate naturally into the ground, but spring high flow events pose a regional risk. Table 3-5 summarizes the flood event probabilities from the 1985 study.

Table 3-5. Spring Flood Event Probabilities for the Gooding Canal

	Drainage Area	Peak Discharges (cfs) and Annual Exceedance Probability (AEP)			
Flooding Source and Location	(square miles)	10%	2%	1%	0.2%
Little Wood River at Gooding	680	375	650	850	1,925

Source: FEMA 1985

The hydrology in the FEMA FIS was updated and published in January 2023. The updated 10 percent AEP was reduced to 208 cfs while the 2 percent AEP was increased to 774 cfs. The AEPs for the 1 percent and 0.2 percent AEPs also showed a reduction in peak discharge. This indicates the flood risk associated with the channel has changed since its original construction. The peak discharges from the original 1985 FEMA FIS are used here as a conservative look at the channel capacity.

The distinction between regional and localized flood risk in Gooding is important. Regional risk comes from the overall Wood River Valley and is typically weather and snowmelt dominated. The topography in the Gooding vicinity is fairly flat, so when the channel capacity of the Gooding Canal is exceeded, flooding may be quite extensive. The Flood Insurance Risk Maps included in the FEMA study (FEMA 1985) reflect this

widespread flooding potential during a regional spring flood event. Addressing overall regional flood risks is beyond the scope of this ILR/EA.

Localized flood risk is related to channel conditions and the flow capacity of the Gooding Canal. Conditions exist in the channel through Gooding that increase the risk of localized flooding. While not extensive, and likely caused by smaller flow events than a regional flood, localized floods damage public and private infrastructure in the city. The rehabilitation of the Gooding Canal would reduce local flood risks.

The future without-project hydrologic conditions are expected to be very similar to the current conditions. Climate change represents an unknown factor with the potential of affecting the hydrologic regime of the basin that could result in changes to the timing or amount of annual precipitation. This may have an impact on regional flood risk, in terms of volumes or timing of high water. However, the localized flood risk will continue, and perhaps increase, based on the current and projected channel conditions.

3.4.7 River Hydraulics

The hydraulic capacity of the Gooding Canal is estimated at 580 cfs, which includes assumptions for reduced conveyance due to ice jams and good channel conditions. That estimate does not account for the failing conditions of portions of the walls. The current capacity of the canal is less than 580 cfs with ice jams considered, as described below.

There are three primary factors that affect the capacity in the channel. First, there is the roughness of the overall channel, as described by the Manning's n coefficients (see Appendix C). In the current condition, between the general roughness of the masonry walls, and the relative roughness of the collapsed or failing sections, the factor is high. By replacing those walls with a smoother material, the roughness factor would drop considerably, and the conveyance would improve. The Hydrology and Hydraulics Calculations (Appendix C) show that, for a flow of 375 cfs (10 percent annual chance exceedance), the water surface elevation (WSEL) could drop around 2.2 feet from the roughness factor alone. This would improve the channel capacity and reduce localized flood risk.

The second primary factor is the failed wall sections, which slump into the channel, creating localized flow constriction and loss of flow area. These slumped areas contribute to higher overall roughness in the channel. Replacing these sections with smooth pre-cast concrete panels and a uniform channel cross-section would affect the WSEL similarly to the other two factors. Appendix C shows that wall replacement could lower the WSEL, improving channel capacity and reducing localized flood risk. Replacing the wall and removing the slumped areas also removes potential sites for ice jams to form.

A final factor that affects flood risk are the five vehicular bridges, which have undersized abutments. These bridges constrict flows and cause ice jamming in the winter, and the removal or replacement of the bridges has been analyzed since the earliest iterations of

the study process. With the WRDA 2022 appropriation, the replacement of both the five vehicular and three pedestrian bridges can be considered in the final solution. There are several hundred residential and commercial structures within 1,000 feet of the Gooding Canal, including a school, a retirement center, churches, businesses, City and county buildings, and numerous private residences. Localized flooding has the potential to reach important community structures and infrastructure quickly and be disruptive and expensive for the NFS.

The three primary factors affecting channel capacity can all be addressed by a rehabilitation or redesign of the canal, which will improve channel capacity and reduce localized flood risk. The effects of all three factors may not be cumulative, however, as other hydraulic factors will affect the river capacity (e.g., river bends, bed slope, irrigation structures downstream, etc.). Given the calculations in Appendix C are simplified, there are some uncertainties in the estimated roughness and slope factors used in the calculations. Small changes in the roughness and slope places the rehabilitated channel close to the transition between tranquil and rapid flow, which has the potential to produce unstable flow conditions. There are also concerns with the potential for super-elevation to occur on outside bends at the 90 degree turns in the channel alignment. These sensitivities and concerns should be investigated during the design phase to ensure proper and safe operation of the rehabilitated channel. The potential for increased project costs due to increased wall heights has been accounted for in the cost contingency used in the cost estimate. During the period of analysis, it is expected that the hydraulic condition of the Gooding Canal will continue to decline. Without rehabilitation of the canal, the city will continue to be exposed to life-safety risks caused by channel failure and localized flooding. The risk of this failure continues to increase every year the channel remains in operation without rehabilitation.

3.5 BUILT ENVIRONMENT

3.5.1 Aesthetics

The existing channel walls are located mainly below grade, except where parapet walls have been constructed along the channel. Because the river and channel are below street grade, they are not always obvious unless a person is standing or walking near the river channel. The current channel walls are constructed of native basalt rock and were carefully fitted together by hand. As such, the wall, where intact, has high aesthetic value to those who appreciate hand craft and natural materials. However, the walls of the Gooding Canal are deteriorating at an accelerated rate. Where the wall has failed, soil has been exposed and weeds grow in these voids and detract from the visual appeal of the wall. In some sections where the wall is failing, the NFS has patched it with concrete, and the use of non-native materials inconsistent with the original construction also detracts from the aesthetic quality of the wall.

It is not practical for the NFS to patch or rebuild the wall by hand where it fails. Thus, it is likely that the structural and aesthetic integrity of the wall will continue to deteriorate, and the aesthetic qualities of the wall will continue to diminish over time.

3.5.2 Cultural Resources

The current basalt rock channel that runs through Gooding was constructed between 1937 and 1941 and funded by the WPA using workers employed by the CCC. It is probable that workers from nearby areas (Hagerman CCC camp No. 2528) were employed in building the rock wall channel. Stone for the armoring project was collected from various farms near the project location. In general, it appears that construction started around Main Street and then proceeded outward towards the east and west. Bridges were built first, followed by armor rip rap (a layer of well-graded angular rock locked together to protect a slope), with the channel wall added last. The river channel was straightened and realigned during construction. Based on its age and association with WPA and CCC related activities, the Gooding Canal has been determined eligible for listing on the NRHP.

The general characteristics of the channel are not expected to change. However, degradation of the channel walls and the associated values are expected to continue.

3.5.3 Transportation

The city of Gooding is bisected by State Highway 46, which is also referred to as Main Street. The highway is the main commercial route between Interstate 84 and Highway 20 via Gooding. A bridge on Highway 46 spans the Gooding Canal. Flooding or failure at the Main Street bridge would result in disruption of transportation of commercial goods and require re-routing of traffic, including commercial truck traffic through residential neighborhoods. Roads through the residential areas were not designed to support heavy truck load capacities that normally utilize Highway 46.

Most other streets in Gooding could be classified as local streets, which provide access to residential properties. One of them is 9th Avenue, which is used by local traffic and school buses; it runs parallel to the Gooding Canal near the failing retaining wall. If 9th Avenue were unavailable due to flooding or failure, traffic would be disrupted, creating an added burden on the surrounding residential roads in the area. Five additional vehicular bridge crossings are located at Nevada, Idaho, Montana, Wyoming, and Oregon Streets. These bridge crossings have low chord heights, and parts of the abutments extend into the channel and act as pinch points during high water. Thus, these bridges diminish the channel capacity and contribute to the formation of ice jams that contribute to localized flooding.

Based on population trends, changes to the transportation system are not expected. The city is built on a grid system that functions effectively, and the NFS has indicated they are unwilling to implement transportation or traffic flow changes that would affect access of emergency service vehicles.

3.5.4 Recreation

Gooding is a small rural community with limited public recreation opportunities in the immediate vicinity. A city park is located adjacent to the canal between California and Nevada Streets and covers one city block. This park has children’s playground

equipment and facilities for picnicking. Fishing along the canal is allowed from existing pedestrian crossings and the park, although the river conditions in the project area do not provide a robust fishery.

Most organized recreation activities in the city are directly related to the public school system. Other recreational opportunities, including snow skiing, ATV riding, and hiking, are available regionally. The city does not have a bike trail or walking path. Floating down the river through the channel is unsafe because there are very few access points to escape from the channel if an accident were to occur. The lack of access or evacuation points in the channel presents restrictions to many types of recreational activities normally associated with rivers due to safety risks.

Opportunities and activities for organized recreation in Gooding are not likely to significantly change in the future because of the municipal investment required to acquire land, develop additional infrastructure, or oversee organized programs.

3.5.5 Hazardous, Toxic and Radioactive Waste

USACE conducted an initial environmental site assessment in 2022 to determine the relative risk of encountering hazardous, toxic, or radioactive waste (HTRW) contaminated materials in the project area. An initial literature review identified no HTRW sites of interest within the area. A full Phase 1 Environmental Site Assessment was conducted in September of 2023, and no HTRW risks were identified (Appendix I). It is unlikely that HTRW risks would appreciably change over the period of analysis.

3.6 ECONOMIC ENVIRONMENT

3.6.1 Socioeconomics

The city of Gooding serves as the county seat of Gooding County. Data from the U.S. Census Bureau 2021 American Community Survey 5-Year Estimates are detailed below.

Population, Demographics, and Social Characteristics

Gooding County has an estimated population of 15,422, with approximately 3,625 of the county's residents living in the City of Gooding.

The city population breakdown by age shows 59 percent of the population is between the ages of 18 and 65. The second largest age demographic is residents under 18 years (21 percent). Residents aged 65 or over is 19 percent of the population and under 5 years is 5 percent of the population.

The ethnic groups in the city of Gooding are identified as White (92 percent), Hispanic or Latino (19 percent), “some other race” (10 percent), and Asian (2 percent).

Seventy-nine percent of the population 5 years and over speak English at home, 20 percent Spanish, and 1.2% other Indo-European language.

Of the population aged 25 and over, 85 percent have the educational attainment of high school graduate or higher and 12 percent, a bachelor's degree or higher. Fifteen percent of the total civilian noninitialized population lives with a disability, with 26 percent of those aged 65 and over living with a disability.

Employment, Income, and Housing

An estimated 65 percent of the population 16 years and over in the city of Gooding is in the labor force with a 15 percent unemployment rate. The top three industries of employment are (1) educational services, health care, and social assistance; (2) professional, scientific, and management, and administrative and waste management services; and (3) retail trade; these industries represent 28 percent, 13 percent, and 12 percent of employment in the city, respectively. The estimated per capita income among the city residents is $22,736, and the median household income is $65,317. In 2021, 22 percent of all people and 16 percent of all families in the city had an income that fell below the national poverty level.

Of the 1,528 housing units in Gooding County, 85 percent were built in 1979 or earlier, and 4 percent were built in 2000 or later. The median housing unit is valued at $116,000, and median gross rent is priced at $720.

3.6.2 Environmental Justice

As outlined in Executive Order 12898, Federal agencies must evaluate environmental justice issues related to any action proposed for implementation. This evaluation includes identification of minority and low-income populations, identification of any negative impacts that would disproportionately affect these minority groups or low-income populations, and proposed mitigation to offset the projected negative impacts. The evaluation of environmental justice issues includes identification of minority and low-income populations in the study area.

Section 160 of WRDA 2020 directs the Secretary to define the term "economically disadvantaged community." Communities identified as disadvantaged by the Council on Environmental Quality's (CEQ) Climate and Economic Justice Screening Tool (CEJST) (https://screeningtool.geoplatform.gov) meet the definition of being economically disadvantaged.

The CEJST, a geospatial mapping tool, identifies areas where communities are faced with significant burdens. These burdens are organized into eight categories: climate change, energy, health, housing, legacy pollution, transportation, water and wastewater, and workforce development. Communities are considered disadvantaged if they are in census tracts that meet the thresholds for one or more environmental, climate, or other burdens, *and* are at or above the threshold for an associated socioeconomic burden.

According to the CEJST, accessed on August 30, 2023, the census tract (16047960100) that contains the Gooding Canal is considered disadvantaged because

it meets more than one burden threshold; the associated socioeconomic burden threshold is noted in Table 3-6.

Table 3-6. Environmental Burdens and Associated Socioeconomic Burdens

Category	Burden	Associated Socioeconomic Burden (Low Income or High School Education)
Housing	Lack of Indoor Plumbing (94th, above 90th percentile)	Low Income (79th, above 65th percentile)
Workforce Development	-	High School Education (20%, above 10%)

3.7 FUTURE WITHOUT-PROJECT CONDITION

The Future Without Project Condition is a forecast of conditions within the study area if no actions are taken to address the identified problems. In the case of flood risk in the city of Gooding, if the channel wall is not rehabilitated or replaced, it is very likely that the flood risk will increase. The outdated construction methods employed, combined with continued natural forces such as ice jams, high river flows, and freeze-thaw heaving will exert pressure on the stone sections of the wall. Various sections of the wall will continue to fail, exposing native soil. It is expected that this exposed soil would erode more quickly, and vegetation would develop in the voids, putting added pressure from roots on the loose rocks. As the stone walls slump into the channel, capacity would be reduced. It is likely that without rehabilitation of the channel the walls will fail, and the adjacent public and private property would be undermined and damaged over time. Section 5 contains a more detailed description of the future without-project conditions, and Section 4.4.1 contains the future without-project conditions' structure inventory details.

SECTION 4 - PLAN FORMULATION AND EVALUATION

This ILR/EA presents the results of analysis using the USACE six-step planning process for risk-informed decisions. The USACE water resources planning process consists of six major steps: (1) specification of water and related land resources problems and opportunities; (2) inventory, forecast, and analysis of water and related land resources conditions within the study area; (3) formulation of alternative plans; (4) evaluation of the effects of the alternative plans; (5) comparison of the alternatives plans; and, (6) selection of the Recommended Plan based upon the comparison of the alternative plans.

The USACE planning process is closely related to the NEPA process. NEPA requires that all Federal agencies use a systematic, interdisciplinary approach to protect the human environment. This approach promotes the integrated use of natural and social science in planning and decision-making. The NEPA process involves a scoping phase, public involvement, and a determination of whether environmental effects of a Federal action are likely to be significant. In this case, an Environmental Assessment was prepared to analyze and disclose the effects of the alternatives. Federal agencies have been encouraged to integrate their planning processes with the NEPA process, therefore this document was prepared as an ILR/EA.

Plan Formulation Methodology

The steps of the USACE planning process are described below:

- **Identify Problems and Opportunities.** The specific problems and opportunities are identified, and the causes of the problems are discussed and documented. Planning objectives and constraints are established and identified.
- **Inventory and Forecast Conditions (Water and Land Related Resources)**. This step characterizes and assesses existing conditions in the project area and forecasts the most probable future without-project condition (or No Action Alternative) over the period of analysis. The future without-project condition describes anticipated conditions and uses in the area over a 50-year period of analysis without any plan implemented as a result of this study.
- **Formulate Alternative Plans.** Potential features are proposed to meet the identified planning objectives. Specific design measures are developed for these features. These measures are combined into alternative plans in a systematic manner to ensure that reasonable alternatives are evaluated.
- **Evaluate Alternative Plans.** The evaluation of the initial array of alternatives consists of measuring or screening plans based upon criteria as described in Section 4.3.2. Criteria include costs, technical considerations, social and economic effects of each plan, and the differences between the future with- and without-project conditions.

- **Compare Alternative Plans.** Alternative plans are compared, focusing on the differences among the alternative plans, and on issues identified by agencies and the public.
- **Select Recommended Plan.** USACE recommends the least-cost alternative plan based on the specific authorization for this project. If a viable plan is not identified, the Recommended Plan would be the No Action Alternative. In most cases, an alternative is selected based on completeness, effectiveness, efficiency, and acceptability.

In addition to the planning process, NEPA is the Nation's primary charter for protection of the environment. This Act establishes policy, sets goals, and contains procedural provisions to ensure that Federal agencies act according to the letter and spirit of the Act.

Federal Objectives

The Federal objective of water and related land resources planning is to contribute to national economic development (NED), consistent with protecting the Nation's environment pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements. Contributions to NED are increases in the net value of the national output of goods and services, expressed in monetary units, and the direct net benefits that accrue to the project area and the rest of the Nation.

The authorizing legislation for this project specifically states that economic justification is not required. Thus, NED benefits were not calculated. The implementation guidance (Appendix A) received from USACE Headquarters regarding WRDA 2007 directs the Walla Walla District to identify the least cost alternative that meets the planning objectives.

4.1 PLAN FORMULATION STRATEGY

The plan formulation strategy for this IRL/EA was focused primarily on identifying the most effective and efficient alternative to rehabilitate the Gooding Canal and provide a complete solution for flood risk management to the city of Gooding that meets the intent of the WRDA legislation. WRDA 2007 authorized USACE to examine solutions for flood risk management and ecosystem restoration. However, funding and acquisition of the lands required to implement meaningful aquatic ecosystem restoration in the urban corridor is not available, and therefore plan formulation efforts were focused solely on flood risk management solutions.

WRDA 2022 authorized additional funding for the project and again stipulated that economic justification for the project was not needed. It provided for a non-traditional cost-share funding split (90 percent Federal and 10 percent non-Federal) and the opportunity for the NFS to finance their cost share over a 30-year period. It also allows the reconstruction or replacement of bridges, typically a NFS responsibility, to be cost shared at the 90 percent/10 percent split.

Three initial alternatives were developed to meet study objectives. These alternatives were compared to the No Action Alternative to identify the recommended least-cost alternative plan. This alternative was then optimized to reasonably maximize qualitative benefits compared to costs. In addition to considering project costs, USACE also considered other factors, such as environmental significance and scarcity, socioeconomic impacts, and historic properties information during its analysis.

4.2 MANAGEMENT MEASURES

Measures are features or activities that can be implemented at a specific location to address one or more planning objectives. Measures are the building blocks that, when grouped together, form alternative plans. The PDT, in conjunction with the NFS, initially developed an array of flood risk management measures intended to address identified problems and opportunities. These measures are both structural and non-structural in nature, and are listed below, and described individually in the following sections.

Non-structural measures include changing floodplain use or accommodating existing uses to the flood hazard by reducing flood damages without significantly altering the nature or extent of flooding. In contrast, structural measures alter the nature or extent of flooding by modifying the magnitude, duration, extent, or timing of flooding.
The legislative language authorizing this project specified that the rehabilitation of the Gooding Canal restore the original level of flood protection and provide ecosystem restoration, if feasible. Following discussions with the NFS, it has been determined that ecosystem restoration is not feasible at this time due to funding and real estate considerations. Thus, the plan formulation focused on flood risk management only. Specific measures are described below.

Specific measures are described listed below and described in Section 4.2.1:

- **Flood Risk Management Measures – Non-Structural**
  - Mechanically break up ice jams.
  - Floodproof structures.
  - Develop flood warning and emergency evacuation systems.
  - Relocate of existing structures.
- **Flood Risk Management Measures – Structural Measures**
  - Reroute river around town using an existing canal system.
  - Repair existing channel walls.
  - Remove parapet walls.
  - Remove existing channel walls.
  - Replace existing channel walls.
  - Construct a new “natural” channel.
  - Modify/replace existing vehicular bridges.

- Modify 90-degree bends in the channel.
- Continue fix-as-fails maintenance, with no comprehensive rehabilitation.

4.2.1 Screening of Flood Risk Management Measures

After the team identified the initial measures, they were evaluated against the planning objectives and planning constraints. If a measure did not meet either of the planning objectives or if it violated the planning constraint, it was eliminated. If a measure met one or both planning objectives, it was retained for consideration. Because the authorizing legislation includes a Federal cost limit, the measures were also screened against cost criteria using best professional judgement. If it was determined that the measure—as implemented at the scale required to meet objectives—would cause an alternative to exceed the Federal cost limit, the measure was eliminated from further consideration.

A discussion of the initial screening of each measure is contained in the following paragraphs, and a summary is depicted in Table 4-1, and Section 4.2.3.

Non-Structural Measures

- **Mechanically break up ice jams.** Mechanical equipment would be used to break up ice jams and allow the river to flow freely through the canal. The NFS currently uses a large backhoe for this purpose as part of their routine channel O&M.

  Breaking up ice jams by mechanical means meets the flood risk management planning objectives to reduce localized flood risk and improve reliability and conveyance, and does not violate any planning constraints. Since this measure is already being effectively applied, it is considered part of the No Action Alternative and will be evaluated as such.

- **Floodproof Existing Structures.** Floodproofing is defined by FEMA as "any combination of structural and non-structural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents."[2] There are many floodproofing methods, and the methods differ depending on whether the structure is residential or commercial. Methods include moving or elevating the structure, applying a sealant to inside walls, or modifying the structure to allow flood waters to flow under the structure.

  Floodproofing meets the flood risk management planning objective to reduce flood risk and damages. However, this measure would need to be implemented in conjunction with other measures, and on a scale that was determined likely to exceed the Federal cost limit. Thus, this measure was ***eliminated from further consideration***.

[2] http://www.fema.gov/national-flood-insurance-program-2/floodproofing, accessed July 2013.

- **Develop Flood warning and emergency evacuation systems.** A local flood warning and emergency evacuation system would be implemented, allowing both residential and commercial structures to be evacuated quickly and in an orderly fashion, if required. Flood warning systems typically consist of a network of streamgages that monitor the rising waters.

  Implementing of flood warning and emergency evacuation systems meets the flood risk management planning objectives to reduce local flood risk and damages. However, it would add costs outside the scope of the Section 3057, WRDA 2007 authorization, which directs the Secretary of the Army to rehabilitate the channel, if feasible. This measure was ***eliminated from further consideration***.

- **Relocate Existing Structures.** All structures directly in the existing canal flood zone would be relocated to areas outside of the flood zone. Because of the topography of the city, relocation could be a considerable distance from the current location.

  Relocation of existing structures meets the planning objectives. However, this measure would need to be implemented in conjunction with other measures, and on a scale that was determined likely to exceed the Federal cost limit. Thus, this measure was ***eliminated from further consideration***.

Structural Measures

- **Reroute river around Town through Existing Canal System.** Using existing canals, water normally flowing through the Gooding Canal would be rerouted around the downtown Gooding area. Examples of potential rerouting options are shown in Figure 2-4.

  Rerouting the river around the town meets the flood risk management planning objective to reduce flood risk and damages and improve conveyance, but it violates the constraint to avoid impacts to existing water rights. Diverting water upstream of the canal would impact downstream water users who have the right to divert water from this stretch of the Little Wood River. This measure was ***eliminated from further consideration.***

- **Repair Existing Channel Walls.** Using basalt rock, the channel walls would be repaired by replacing broken or missing stones. The stones would likely be replaced by hand.

  Repairing existing channel walls meets the flood risk management planning objectives to reduce flood risk and damages and does not violate any planning constraints. This measure was ***retained for further consideration***.

- **Remove only the Parapet Walls.** The parapet walls running the entire length of the concrete channel would be removed. At present, these walls are not likely to withstand any type of flooding due to their deteriorated condition.

  Removing the parapet walls does not meet any of the planning objectives. This measure was ***eliminated from further consideration***.

- **Remove Existing Channel Walls.** The existing channel walls have deteriorated due to the impermanence of the construction methods, and they no longer provide reliable flood protection. In some areas, the walls are slumping into the river channel as they fail. This measure proposes removal of the existing channel walls with no replacement with a hardened or engineered material. Removing the existing walls (without replacement) meets the flood risk management planning objectives to reduce risk from channel wall failure, but would increase flood risks resulting from additional erosion, which could lead to significant failure. This measure was ***eliminated from further consideration***.
- **Replace Existing Channel Walls.** A new channel wall would be constructed in the same footprint as the existing channel. The existing channel walls would be removed and replaced with a hardened material such as pre-cast concrete sections tied into the existing bridge abutments. Replacement of channel walls would require the three pedestrian bridges to be removed for construction and, depending on their condition, potentially require replacement.

  Replacing existing channel walls meets all of the flood risk management planning objectives and does not violate any planning constraints. This measure was ***retained for further consideration***.
- **Construct New "Natural" Channel.** Using reference reaches as guidelines, a new and naturalized channel would be created to replace the Gooding Canal. Natural channels typically take on a trapezoidal shape compared to the existing rectangular channel. The naturalized channel could include typical instream structures, such as riffles and resting pools, as well as riparian plantings along the laid-back side slopes of the bank.

  Constructing a new "natural" channel meets the flood risk management planning objective to reduce flooding and damages from channel wall failure. However, conveying the intended volume of water through a naturalized channel would require increasing the cross-sectional area of the channel and laying back the slopes for safety This would require the acquisition of a significant amount of real estate along the channel. Based on best professional judgement, this measure is likely to exceed Federal cost limits and was therefore **eliminated from further consideration**.
- **Modify/Replace Existing Vehicular Bridges.** Five vehicular bridges that are known channel constrictions would be replaced. The bridge abutments contribute to ice jams, one cause of localized flooding. Existing bridges would be replaced by bridges with wider abutments and higher decks, eliminating the existing channel constriction.

  Modifying or replacing existing bridges meets the flood risk management planning objective to reduce flood risk and damages from wall failure and ice jams. This measure was ***retained for further consideration***.
- **Modify 90-Degree Bends in the Channel.** The Gooding Canal was straightened and realigned during construction of the current channel. The realignment includes two 90-degree bends, which are often locations for ice

jamming. For this measure, the canal would be realigned to eliminate those bends, reducing the potential for ice jams and lowering the WSEL.

Modifying 90-degree bends in the channel meets the flood risk management planning objective to reduce flooding and damages from ice jams but would require the acquisition of a significant amount of real estate within the city of Gooding. This measure is likely to exceed Federal cost limits and was therefore **eliminated from further consideration**.

4.2.2 Opportunities outside of the National Objectives

The following opportunities are outside the scope of the Federal project but could be included as betterments to the proposed project and implemented by USACE if fully funded by the NFS or implemented separately by the NFS. Most of these action items were identified by stakeholders in the public scoping process. None of these measures were carried forward in the plan formulation process because they do not meet the planning objectives. Additional opportunities for implementation are available to the NFS, as described below.

Improve Public Safety Associated with the Gooding Canal

Public safety, though not a specific study objective, was identified as a planning consideration. The following actions could be added to a Recommended Plan to address this consideration:

- **Fence Perimeter of Channel.** Fencing the perimeter of the channel would increase public safety. Fencing was not included in the original construction of the canal, but fencing of various types and strengths has been added along the length of the channel to improve public safety. Given the proximity to a school for the deaf and blind, fencing the channel is an important consideration for public safety. A strong, cohesive fencing system along the length of the channel would support public safety.
- **Ladders.** The addition of ladders for ingress/egress at various locations along the channel would improve emergency access. Current channel walls are steeply vertical, and there is no means for safe access into or out of the channel.
- **Security Lighting along the Channel Boundary.** Adding lighting along the channel boundary would increase public safety around the channel, but this was not part of the original construction.

Interpret the Cultural Significance of the Gooding Canal

The following items were identified in public scoping to preserve and interpret the historical importance of the Gooding Canal. Under the terms of the MOA with the Idaho SHPO, these actions (or a combination of these actions) would provide mitigation for impacts to the historic property from construction of a modern channel.

- **Use Channel Rock in the Design of New Project Features.** Historical rock could be reused in fencing design, historic signs, benches, or other features. Re-using the lava rock in this way could help mitigate for the removal of this historic rock wall channel.
- **Historical Marker, Recordation, or Plaques with Photos and Description of Channel Wall.** Educational materials and historical records of the Gooding Canal could be used to help mitigate for the removal of the historic rock walls. Negotiations with the Idaho SHPO have determined this is appropriate mitigation for impacts to the historic wall.
- **Interpretive Signs along Channel.** Signage that interprets the natural and recreational features of the river could be constructed in areas adjacent to the channel. Signage related to the historical significance of the wall could be considered mitigation for impacts to the historic resource and would be included as a project cost.

4.2.3 Measures Retained for Further Consideration

The following measures were retained for further evaluation:

- Repair Existing Channel Walls.
- Replace Existing Channel Walls.
- Modify/Replace Existing Vehicular Bridges

A summary of the initial screening of measures is contained in Table 4-1, below.

Table 4-1. Summary of Flood Risk Management Measure Screening

	Meets Planning Objectives		Violates Constraints	Within Scope of Authority	Does Not Exceed Cost Limits	Carried Forward
Name of Measure	**Reduce Risk from Failure of Walls and Ice Jams**	**Improve Reliability and Conveyance**	**Avoid Negative Impacts to Water Rights Holders**			
Floodproof Structures	X			X	X	
Flood Warning & Evacuation System				X	X	
Relocate Structures	X					
Reroute River into Existing Canals	X	X	X			
Repair Existing Channel Walls	X	X		X	X	X
Remove Parapet Walls Only				X		
Remove Existing Walls	X			X		
Replace Existing Walls	X	X		X	X	X
Construct New “Natural” Channel	X			X		
Modify/Replace Existing Vehicular Bridges	X	X		X	X	X
Modify 90-degree bends in channel	X	X		X		

4.3 FORMULATION OF THE ARRAYS OF ALTERNATIVES

The next step in the plan formulation process combines the measures discussed above into Alternative Plans (Alternatives) that meet the study objectives.

4.3.1 Initial Array of Alternatives

The following is an initial array of alternative action plans that meet the planning objectives:

- **Alternative 1 – No Action Alternative: Continuation of the Current Fix-as-Fails O&M Program of the Gooding Canal.** This alternative would continue the existing O&M program with no change and rely on the use of heavy equipment to break up ice jams in the winter. There would be no modification of the channel or bridges to prevent ice jams or erosion, or to improve conveyance.
- **Alternative 2 – Replace Existing Channel Walls.** Channel walls would be replaced entirely with new, engineered concrete channel walls and tied into existing bridge abutments. Replacement of the channel walls would require the three pedestrian bridges to be removed and replaced with bridges that meet current safety criteria. Only the pedestrian bridges would be affected by this alternative.
- **Alternative 3 – Repair Existing Channel Walls.** Using basalt rock, the channel walls would be repaired by replacing broken or missing stones and grouted. In some locations, the stone walls may be patched with concrete, depending on the severity and scale of the damage. Neither pedestrian nor vehicular bridges would be replaced with implementation of this alternative.
- **Alternative 4 – Combination of Repair and Replacement of Channel Walls and Replacement of Vehicular and Pedestrian Bridges**. This alternative would replace severely damaged walls in the lower reaches and allow for wall repair in the upstream reach where the channel wall is still in relatively good shape, thus providing flexibility to respond to existing conditions. Repairs could include concrete patches or reconstruction of the existing wall, or replacement of the wall, depending upon the severity of the deterioration. Existing vehicular bridges would be replaced with bridges that adequately span the channel and meet current road design criteria. Replacement of the channel walls would require the three pedestrian bridges to be removed, and they would be replaced with bridges that meet current safety criteria. This alternative would allow the most cost-effective approach to be applied to each separable part of the project.

For all action alternatives, excavation would be limited to removal of the lava rock pieces and grouting material. Since the size of the channel would not be increased, soil removal is not anticipated. Minor movement of soil to dress the site and prepare the surface for the rehabilitation work is anticipated. Minimal soil removal or disposal is anticipated.

Waste rock and grout would be disposed of as construction waste. No evidence of contamination has been observed or reported. If present, it would likely be visible as stains on the rock walls. If contamination is encountered or identified later, appropriate actions and adjustments to the construction work would be implemented.

4.3.2 Principles and Guidelines Criteria

Projects must be formulated to reasonably maximize benefits. Each alternative plan shall be formulated in consideration of four criteria described in the "Principle and Guidelines Report", (U.S. Water Resources Council, 1983), completeness, effectiveness, efficiency, and acceptability.

- Completeness: the extent to which the alternative plans provide and account for all necessary investments or other actions to ensure the realization of the planning objectives, including actions by other Federal and non-Federal entities.
- Effectiveness: the extent to which the alternative plans contribute to achieve the planning objectives.
- Efficiency: the extent to which an alternative plan is the most cost-effective means of achieving the objectives.
- Acceptability: the extent to which the alternative plans are acceptable in terms of applicable laws, regulations, and public policies.

Using this guidance, each alternative was evaluated to determine if it met the four criteria described above. The outcome of that evaluation is described below (and shown in Table 4-2):

Alternative 1 – No Action Alternative: Continuation of the Current Fix-as-Fails O&M Program of the Gooding Canal. The No Action Alternative is the alternative against which all others are compared and is ***carried forward for evaluation***. Under this alternative, the City of Gooding would continue the existing O&M program and fix the channel as it fails. Winter ice jams would continue to be broken up by heavy equipment to prevent localized flooding. The No Action Alternative does not meet the criteria for effectiveness, as maintaining the channel in its current form does not lower flood risk or contribute to improved conveyance. This is not a cost-effective solution because the O&M burden of doing nothing will continue to increase over time without meeting the planning objectives.

Alternative 2 – Replace Existing Channel Walls. Alternative 2 does not meet the planning objective to reduce flood risk. Although this alternative would improve the channel walls, it does not replace the bridges, which reduce capacity and are a source of ice jamming. The alternative improves channel reliability, but only marginally improves conveyance in the channel by smoothing the channel walls. It does, however, improve channel reliability. It is acceptable in that it meets all applicable laws, regulations, and public policies and is efficient due to the lower cost to construct it in comparison with other alternatives. However, while it is initially a lower cost alternative, it is not effective as it does not solve the entire problem or meet the intent of the

authorizing legislation. The O&M would continue to be a burden to the NFS because of continued ice jam blockages at the bridges. ***Alternative 2 – Replace Existing Channel Walls was eliminated from further consideration.***

Alternative 3 – Repair Existing Channel Walls. Alternative 3 only partially meets the planning objectives. It is not effective as it minimally contributes to the objective to improve reliability and conveyance but does nothing to help reduce the risk of other wall failures and the buildup of ice jams on the bridge abutments. While it is the least-cost alternative (outside of the No Action Alternative) and, therefore, is efficient, the temporary nature of repairs causes additional reliability issues. Higher future O&M costs than other alternatives would result from this alternative, thus reducing its efficiency. It is an acceptable alternative because it does meet applicable laws, regulations, and public policies. ***Alternative 3 – Repair Existing Channel Walls was eliminated from further consideration.***

Alternative 4 – Combination of Repair and Replacement of Channel Walls and Replacement of Vehicular and Pedestrian Bridges. This alternative recommends replacement of the wall in the reaches that are most deteriorated, while allowing for the repair of the walls, as needed, in the upstream reach that is still in good condition. Both vehicular and pedestrian bridges would be replaced. The alternative meets all four of the planning criteria. Since costs will drive decisions related to the approach taken at specific sites, this alternative represents the least cost action alternative to meet requirements in the authorizing legislation. Although minor O&M repairs are still anticipated, with the replacement of the majority of the channel walls and bridges, the costs for O&M under this alternative are expected to be substantially less than O&M with any of the other alternatives considered. ***Alternative 4 – Combination of Repair and Replacement of Channel Walls and Replacement of Vehicular and Pedestrian Bridges is carried forward for evaluation*.**

Table 4-2. Alternatives Screening

Screening Criteria	Alt 1	Alt 2	Alt 3	Alt 4
Completeness	X	X	X	X
Effectiveness				X
Efficiency		X	X	X
Acceptability	X	X	X	X
Planning Objective 1 – Reduce Flood Risk			X	X
Planning Objective 2 – Improve Channel Reliability/Conveyance				X
Does Not Violate Planning Constraints	X	X	X	X

4.3.3 Final Array of Alternatives

Only two alternatives were recommended for final evaluation: Alternative 1 – No Action and Alternative 4 – Combination of Repair and Replacement of Channel Walls and Replacement of Vehicular and Pedestrian Bridges.

4.4 EVALUATION AND COMPARISON OF ALTERNATIVES

Alternatives were compared to identify the single alternative that provides the most benefits for the least cost, as directed by the implementation guidance for this study. After preliminary screening and comparison, only two alternatives remain for evaluation: and are described below.

Alternative 1 - No Action does not meet the objective to reduce localized flood risks and damages, nor does it improve reliability and conveyance of the channel. Under the No Action Alternative, the channel conditions would not improve. The channel wall would continue to deteriorate, and the risk of erosion and localized damages from flooding would increase. The flow capacity and volume of the channel would be further reduced as additional materials fall into the channel. Decreased volume and flow conveyance would increase localized flood risk as well. As the wall continues to deteriorate, O&M costs and the level of effort to maintain flood protection and conveyance would increase, which would continue the risk to the community and would prolong current O&M challenges for the NFS. Although the No Action Alternative does not meet the Purpose and Need of the study because it does not provide localized flood risk management due to its deteriorated condition, it is carried forward into Section 5, Environmental Effects, as a baseline from which to compare other alternatives.

Alternative 4 provides flexibility to implement either repair or replacement where appropriate. This alternative meets both planning objectives and does not violate the planning constraint. It provides the most cost-effective solution for reducing flood risk in Gooding and can be implemented without violating the Federal cost limit identified in the study authority.

4.4.1 Documentation of Comprehensive Benefits

A policy memo issued by the Assistant Secretary of the Army for Civil Works in January 2021, *Comprehensive Documentation of Benefits in Decision Documents,* requires USACE to identify benefits beyond the quantitative National Economic Development (NED) benefits. Because the authorizing language for this project does not require an economic analysis, a qualitative assessment of benefits across the four benefit categories for Alternative 4 was conducted to meet these requirements.

National Economic Development (NED) Benefits

A structure inventory of the study area was developed utilizing refinement of the 2022 National Structure Inventory (NSI) and the 1 percent AEP flood inundation that was developed in the 2018 FEMA FIS update (published in 2023) demonstrating the future without-project condition (Figure 4-1). An estimated 902 structures are within the study area and face potential inundation in the future without-project condition. This consists of 765 residential structures, 121 commercial structures, and 15 public structures such as schools, churches, and government buildings. Critical infrastructure includes the Gooding County Sheriff's Department on Main and 7th. Total property value estimated at $245 million (FY24 price level escalated via Engineering News Record Construction

Cost Index) faces potential damages. An increase in channel capacity would potentially reduce the impacted area and consequently reduce the estimated potential damages.

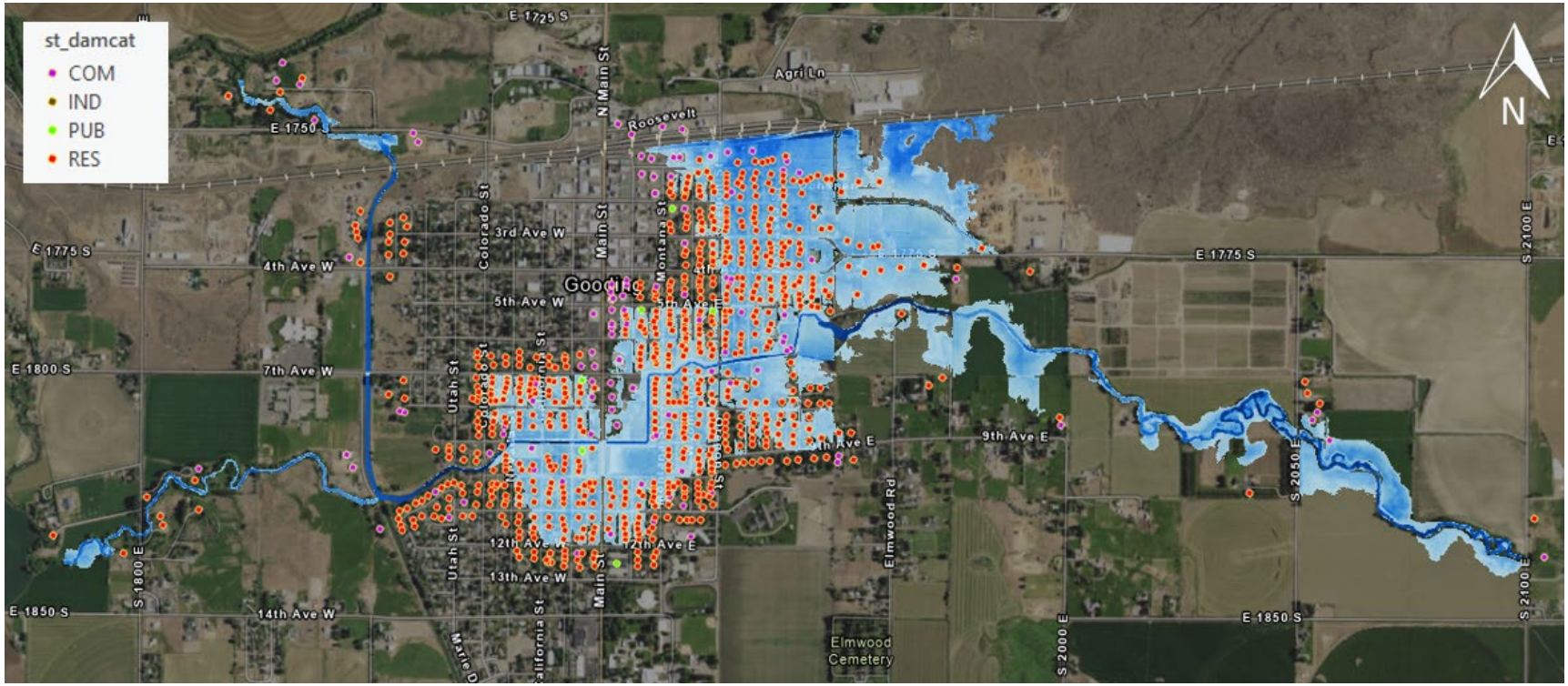

Figure 4-1. Future Without-Project Condition Structure Inventory of 1 Percent AEP Flood Inundation Study Area

Because the authorizing language for this project states that economic justification is not required, flood risk reduction benefits were not quantified, and a National Economic Development (NED) plan for flood risk management benefits was not developed for this study. This project is authorized to address localized flooding and to restore the previous level of flood protection. As such, it would not be expected to realize a high NED benefit.

Regional Economic Development (RED) Benefits

An analysis of the RED benefits shows an expected short-term benefit to the regional economy from the construction of the project. This benefit would be realized in the procurement of materials and labor needed to construct the project, which due to the relatively short construction timeline, would result in a minor RED benefit. Implementation of this project would be expected to rehabilitate the flood risk infrastructure through the city of Gooding, which could result in a small benefit to the reliability of the movement of goods in the region because the channel intersects a state highway in one location. However, this improvement likely represents a modest benefit to the regional economy during construction and after construction during flood events.

The expenditures associated with all work activities from the reconstruction of this project at Little Wood River are estimated to be $36.8 million. Of this total expenditure, $26.4 million will be captured within the local impact area near Gooding, Idaho. The remainder of the expenditures will be captured within the state impact area and the Nation. These direct expenditures generate additional economic activity, often called secondary or multiplier effects. The direct and secondary impacts are measured in output, jobs, labor income, and gross regional product (value added). The regional economic effects are described here for the local, state, and national impact areas. In summary, the expenditure amount of $36.8 million during construction support a total of 397 full-time equivalent jobs per year, $20.9 million in labor income, $24.7 million in the gross regional product, and $38.0 million in economic output in the local impact area. More broadly, these expenditures support 708 full-time equivalent jobs per year, $46.7 million in labor income, $61.5 million in the gross regional product, and $103.4 million in economic output in the Nation. All benefits captured here are provided in annual units in FY24 price levels.

Other Social Effects (OSE)

A project to repair and replace the failing channel wall in Gooding would yield positive social effects to the community of Gooding. The effort would lower the risk of loss of life associated with flooding, and improve safety for residents, particularly for those at the Idaho School for Deaf and Blind, located only a few blocks from the Gooding Canal. The estimated population at risk for the future without-project condition 1 percent AEP flood inundation study area is 2,032 people at night and 1,788 people during the day, due to the largely residential characteristics of the study area (approximately 765 homes) and individuals sleeping in their homes at night. An increase in channel capacity would

potentially reduce the impacted area and consequently reduce the population at risk, improving life safety.

Environmental Quality (EQ)

It is estimated that few direct environmental benefits would be realized under Alternative 4. The repair and replacement of sections of the channel wall would lower flood risk, but there are no measures intended to realize ecosystem restoration or targeted and quantified environmental benefits. Some aesthetic benefits would be likely but are a trade-off with changing the historic stacked stone visual aspects of the existing channel. Cultural-related impacts are offset by mitigation incorporated into project requirements. The potential for impacts to aquatic resources from extensive dewatering are avoided by limiting the extent of channel dewatering.

4.4.2 Proposed Action Alternative

The Proposed Action Alternative (Alternative 4) is determined to be the most cost effective and provide benefits in excess of directed repair cost as determined during the Section 905(b) Report, completed in July 2000 (refer to Appendix B), which computed a benefit-cost ratio of 1.8. Since that study was completed, the risk of flooding in a given year has increased as the existing system has continued to degrade, and potential damages have increased as property values have also increased. Adjusted for inflation, the cost to rehabilitate the system is very similar to the costs used in that study. The Proposed Action Alternative is the lowest cost alternative that meets all of the objectives and requirements provided in the implementation guidance and authority, including the cost limitations.

Alternative 4, Combination of Repair and Replacement of Channel Walls and Replacement of Vehicular and Pedestrian Bridges, is the only proposed alternative that meets the planning criteria for completeness, effectiveness, efficiency, and acceptability; is feasible; satisfies the NFS's main interest of flood risk reduction; and is cost effective and within the Federal cost limit. Alternative 4 also provides the most benefit across the four accounts, as described above, and thus, Alternative 4 is the Proposed Action Alternative and is carried forward into Section 5, Environmental Effects, for analysis.

SECTION 5 - ENVIRONMENTAL EFFECTS

This section assesses potential effects to environmental resources identified in Section 3 that could result from the rehabilitation of the Gooding Canal and replacement of area bridges.

In compliance with NEPA, the No Action Alternative must be carried forward into the effects analysis to assess potential environmental consequences/effects. The No Action Alternative, similar to the future without-project condition (refer to Section 3), is used as the baseline from which other alternatives are evaluated against to determine effects.

A summary of potential environmental effects of the No Action Alternative and Alternative 4, the Proposed Action Alternative, for all environmental resources considered is shown in Table 5-1. However, only water quality, biological/endangered species, environmental justice, cultural resources, and cumulative effects are analyzed in further detail following the table summary.

Greenhouse gas (Appendix K) and climate change (Appendix J) are also considered in some detail, along with Hazardous, Toxic, Radioactive Waste (HTRW) (Appendix I), as mandatory additional considerations for planning studies under NEPA.

Table 5-1. Summary of Environmental Effects on the Action and No-Action Alternatives

Resources	Alternative 1 - No Action	Alternative 4
NATURAL ENVIRONMENT		
Climate / Climate Change and Greenhouse Gas	No change to current conditions.	Proposed work would have minimal temporary impact on existing conditions. The CEQ NEPA guidance for evaluating the effects of climate change and GHG emissions uses 25,000 metric tons of CO2-equivalent emissions produced annually by a proposed action as a baseline indicator and reporting threshold. The total GHG emissions produced by project equipment for the limited time of construction and concrete usage is well below this threshold at 1,562 metric tons (Appendices J and K).
Vegetation	The condition of vegetation in the study area would remain basically unchanged. The current lack of riparian vegetation through the city of Gooding would not change. Invasive plant species may begin to grow in areas where the wall is deteriorating and exposing bare soils. The potential growth of this type of vegetation could cause deterioration to the wall through pressure caused by plant roots.	Project work would be confined primarily to the river channel and would have minimal impact on vegetation. (See Appendix G.)
Wildlife / Fisheries and Aquatic resources / Endangered Species	Under this alternative, there would be no construction within the Gooding Canal and the de-watering of a 4-6 mile stretch of the Little Wood River would be avoided, along with any possible accompanying impacts. Improvements for wildlife in the study area are not likely to take place due to the established urban development immediately surrounding the channel.	Implementation of Alternative 4 would cause less than significant effects. (See discussion below and Appendices G and H.)
PHYSICAL ENVIRONMENT		
Topography / Geology / Soils	There would be no change to current conditions. Continued deterioration of the Gooding Canal would result in erosion occurring in areas where the rock wall has collapsed.	Proposed work would have minimal impact on existing conditions given the limited amount of earthwork to be done. Most work would be done in previously disturbed areas.
Air Quality	No change to current conditions.	The amount of machinery to be used and limited duration of the proposed work (See the GHG analysis in Appendix K), when added to existing conditions, would add only a negligible amount of additional pollutants to current conditions. The Gooding area would still be in “attainment.”
Water Quality	No change to current conditions.	See discussion below

Resources	Alternative 1 - No Action	Alternative 4
Noise	No change to current conditions.	Work would result in temporary impacts to noise levels caused by construction activities. Residents of adjacent and nearby homes could experience impacts to comfort and wellbeing with noise impacts to their day-to-day lives. However, in most cases smaller sized equipment would be used, and work would be conducted within the designated city ordinance allowed time of 7:30 AM and 7:00 PM. Further, much construction would occur within the channel itself, providing a notable noise barrier to lessen most impacts. Project work activity would therefore result in only a minor addition to the overall noise level in the city and ongoing traffic noise to either side of the channel and across bridges. Noise levels would not approach physiologically damaging levels.
Agriculture / Prime and Unique Farmlands / Land Use	No change to current conditions.	Work would be confined to the existing river channel and would not impact land use.
Hydrology	Hydrologic conditions are likely to be very similar to current conditions. Climate change represents an unknown potential factor in changing the hydrologic regime of the basin, perhaps changing the timing or amount of annual precipitation. This may have an impact on regional flood risk, in terms of volumes or timing of high-water flows. However, the local flood risk would continue, and perhaps worsen, based on the hydraulic conditions of the channel itself. Irrigation activities would continue in the region, removing water from the Gooding reach of the Little Wood River and redistributing it throughout the valley.	Current conditions exist in the Gooding Canal that increase the risk for localized flooding. There are several hundred structures within 1,000 feet of Gooding Canal, including a school, a retirement center, churches, businesses, city and county buildings, and numerous private residences. Because of the topography, localized flooding could cause a notable impact to residences, businesses, and infrastructure, even if at a smaller scale than a regional flood. The rehabilitation of the Gooding Canal would help to reduce the localized flood risk by improving hydrologic conditions.
River Hydraulics	River hydraulic conditions are likely to worsen as the wall continues to deteriorate.	The three primary factors affecting the channel capacity will all be addressed, which will improve the channel capacity and reduce localized flood risk. The effects of all of the factors may not be directly additive in terms of the total improvement, as other hydraulic factors will

Resources	Alternative 1 - No Action	Alternative 4
		affect the river capacity (i.e., river bends, bed slope, check/irrigation structures downstream of the repaired reach, etc.). However, the overall effect will be very favorable for the city.
BUILT ENVIRONMENT		
Aesthetics	The aesthetics of the structure would continue to deteriorate as the wall deteriorates. It is unlikely that the NFS would be able to restore the wall to its original appearance and the current practice of patching the wall in deteriorated sections further detracts from the aesthetic appearance of the wall. As the wall continues to fail, unappealing invasive vegetation would also begin growing in the canal.	The new channel lining consisting of tied-back precast concrete panel walls would have a different appearance (concrete) and lack the appeal of hand craftsmanship of the original wall. These effects would be minor and permanent.
Cultural Resources	The wall would continue to deteriorate, and it is unlikely the NFS would have the financial resources to make needed repairs and maintain the structure at a sufficient level to minimize flooding risks. It is anticipated deterioration would continue over time, resulting in the continued loss of the masonry wall's historical significance.	Due to the historic nature of the channel construction, this alternative could have notable effects that would be mitigated according to an agreement with the SHPO. Therefore, project effects would be less than significant. See discussion below.
Transportation	The city's current transportation structure is built on a grid system that functions efficiently. Future growth that would impact transportation patterns is not expected in the Gooding area. No alteration of existing bridges or bridge crossings is anticipated, due to the high cost to the NFS.	Three footbridges would be removed prior to construction, and replaced, resulting in temporary minor impacts. Replacement of vehicular bridges would induce longer-term moderate disruptions in transportation, but the effects would be temporary. Otherwise, no long-term change or functional impacts to existing transportation system would occur.
Recreation	No change to current trends.	Except during construction, recreational opportunities would remain unchanged. During construction, some opportunities may be temporarily difficult to access or may not be available for short periods of time.
Hazardous, Toxic and Radioactive Waste	No risks of encountering or exacerbating contaminated conditions were identified in a literature review/due diligence examination for the ongoing No Action Alternative.	No risks of encountering or exacerbating contaminated conditions were identified in the Phase 1 environmental condition of properties assessment for Alternative 4.
ECONOMIC ENVIRONMENT		
Socioeconomics / Population, Demographics, and	The No Action Alternative would not result in the unfair treatment of low income or minority groups. However, due to the projected moderate risk of flooding in Gooding over the next 50 years and	Implementation of Alternative 4 would not have any negative impacts (e.g., economically) on any minority or economically disadvantaged group or

Resources	Alternative 1 - No Action	Alternative 4
Social Characteristics / Environmental Justice	continued deterioration of the existing conditions of the channel, there is potential for future stressors on the community. As a result, the No-Action Alternative would have minor negative impacts to socioeconomics or environmental justice.	social class. The improvements would be of benefit to all Gooding residents, particularly those living adjacent to the channel. (See Environmental Justice discussion below.)

5.1 WATER QUALITY

Alternative 1 – No Action Alternative

Under the No Action Alternative, it is likely that existing water quality would remain at the current impaired level as described in Section 3.3.3. Ongoing efforts by the State of Idaho may reduce the water quality impairments over time.

Alternative 4 – Combination of Repair and Replacement of Channel Walls and Replacement of Vehicular and Pedestrian Bridges

Construction activities associated with implementation of Alternative 4 would be limited to existing developed upland roads, staging areas, and the existing project footprint of the constructed channel, thus minimizing adverse effects to valuable habitat or riparian areas, and subsequently, water quality.

With the implementation of Alternative 4, it is likely that existing water quality would remain at the current impaired level as described in Section 3.3.3. Likewise, agricultural land use and practices in the vicinity of the proposed action area are unlikely to change. No adverse long-term impacts to water quality are anticipated. However, some temporary impacts, such as minor increases in turbidity and lost habitat from dewatering actions would be anticipated. Best management practices and limits placed on the timing and duration of dewatering activities would avoid unacceptable adverse impacts to water quality and related habitat as discussed below.

5.2 WILDLIFE, FISHERIES AND AQUATIC RESOURCES, AND THREATENED AND ENDANGERED SPECIES

Alternative 1 – No Action Alternative

While there are no ESA protected species in the immediate area, the Banbury Springs Limpet (endangered) and the Monarch Butterfly (Candidate) could be found regionally. There are several “Species of Greatest Conservation Need” that inhabit the area, including bald eagles. The fish community within the Little Wood River is made up of cool and warm water species – e.g., rainbow trout, brown trout, smallmouth bass, and yellow perch. Riparian habitat along this upstream stretch of the river provides breeding, nesting, denning, and roosting habitat for migratory songbirds, birds of prey, waterfowl, shorebirds, aquatic mammals, small mammals, reptiles, and amphibians. The channel as it is today provides poor habitat at best for any of these species and there would be no notable changes to wildlife, aquatic species or ESA protected species and related habitats in the foreseeable future.

Alternative 4 – Combination of Repair and Replacement of Channel Walls and Replacement of Vehicular and Pedestrian Bridges

Under this alternative and prior to starting work on the walls, part of the Little Wood River flow would be diverted around Gooding at existing diversion points. These diversion points are approximately 4 and 6 miles upstream from Gooding (Figure 5-13).

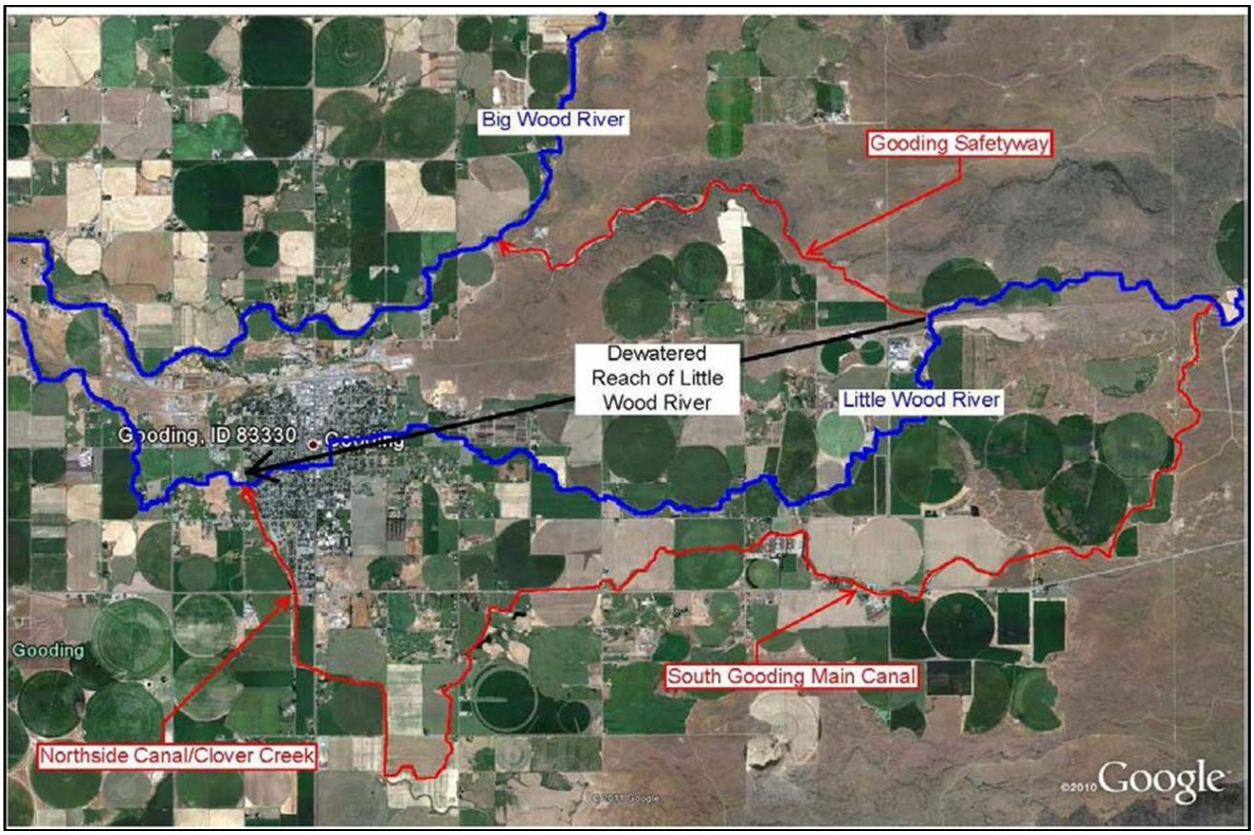

Figure 5-13. Possible Diversion Channels (red lines) to Dewater Gooding Canal

The partial dewatering would be conducted slowly to encourage fish to leave with the receding water. Once much of the water is diverted, and the pipes or pumps are put in place to route water through the construction sites, construction would be done in the dry.

Currently, the fish community within the Little Wood River is made up of cool and warm water species (e.g., rainbow trout, brown trout, smallmouth bass, and yellow perch). There are several “Species of Greatest Conservation Need” that inhabit the area, including bald eagles. Riparian land along this upstream stretch of the river provides breeding, nesting, denning, and roosting habitat for migratory songbirds, birds of prey, waterfowl, shorebirds, aquatic mammals, small mammals, reptiles, and amphibians. Because of the location and timing of construction associated with Alternative 4 (October through March), it is unlikely that major impacts or disturbances to aquatic, terrestrial, and ESA-listed species would occur based on implementation of dewatering BMPs to be implemented relative to aquatic resources, as discussed below.

As discussed in Section 3, USACE reviewed the current list of threatened, endangered, and candidate species that could be found near the project area under the jurisdiction of NMFS and the USFWS. Alternative 4 would have no effect to such species, as individuals and habitats are not present. Birds of conservation concern would also not be affected as the project area lacks suitable foraging or nesting habitat.

General aquatic and riparian dependent wildlife species may be directly or indirectly impacted by partial dewatering of riverine habitat. Direct effects may include overall trophic disruption, increased predation, individual fish and wildlife mortalities, temporary loss of forage, short-term displacement, and reduced species diversity. Indirect effects may include temporary habitat degradation during construction, short-term loss of primary (albeit low quality) productivity, limited riparian vegetation dehydration, and low-level downstream habitat impacts.

Idaho's Department of Fish and Game (IDFG) has encouraged preservation of the riverine connectivity to the greatest extent feasible during construction to minimize impacts. They have also provided recommendations on how to minimize impacts to fish and wildlife from the proposed dewatering effort. A verbal concurrence in support of IDFG recommendations was received from the USFWS (USFWS 2012). (See Section 6.11, Environmental Commitments, for details of impact avoidance and minimization measures.)

USACE Endangered Species Act Determinations

After a review of the species lists and critical habitat lists, a review of the biological requirements of the identified species, and a review of the project description, timing, construction, and nature of the action, USACE determined that species and critical habitats would be spatially or temporally separated from the proposed action. While the proposed action is likely to produce potential stressors, species and critical habitats are not likely to be exposed to those potential stressors because of the distance of the proposed action from the Snake River, the absence of species or specific life history stages of species from the vicinity of the proposed action, habitat conditions at the construction site, and the implementation of the environmental stipulations. USACE determined that this action, as proposed, would have No Effect on all ESA-listed (or candidate) species and their designated critical habitats. Table 5-2 provides a summary of the USACE ESA and related determinations. This information is discussed in more detail in Appendix G, Biological Evaluation.

Table 5-2. Determinations for the Project Area

ESA		
Common Name	Species	Critical Habitat
USFWS		
Banbury Springs Limpet	No Effect	None Designated
Monarch Butterfly	No Effect	None Designated
MSA		
No Essential Fish Habitat present in the project/study area		
FWCA		
Not Applicable (See Appendix H)		
MBTA		
No Take/adverse effects to Rufous Hummingbird (*Selasphorus rufus*)		
Bald and Golden Eagle Protection Act (BGEPA)		
No Take		

FWCA – Fish and Wildlife Coordination Act.

5.3 ENVIRONMENTAL JUSTICE

The Council on Environmental Quality (CEQ) Climate and Economic Justice Screening Tool (CEJST) was accessed on August 30, 2023, to search Gooding for disadvantaged communities and identified the proposed action area as disadvantaged since it meets more than one burden threshold and the associated socioeconomic burden threshold. The proposed action area is 94th above the 90th percentile for lack of indoor plumbing and 79th above the 65th percentile for low income. Also, 20% of the local population aged 25 years or older have an education level less than a high school diploma, which is above the 10 percent threshold. Considering these indicated burdens, the potential environmental effects of the No Action Alternative and Alternative 4 are detailed below.

Alternative 1 – No Action Alternative

The No Action Alternative would not lead to actions that exceed the capacity of the surrounding communities to absorb or result in the unfair treatment of low income or minority groups. However, the city of Gooding is projected to have a moderate risk of flooding over the next 30 years, and continued deterioration of existing conditions within the project area could lead to potential future stressors on the community. As a result, this alternative would have minor negative impacts to socioeconomics or environmental justice.

Alternative 4 – Combination of Repair and Replacement of Channel Walls and Replacement of Vehicular and Pedestrian Bridges

Implementation of Alternative 4 would provide long-term benefits by reducing flood risk in the city of Gooding, which would effectively reduce future climate-driven burdens on the existing overburdened and underserved community. This alternative would not lead to the unfair treatment of low income or minority groups or result in the disproportional distribution of environmental impacts or benefits among communities. The

implementation of this alternative would not have significant impacts to socioeconomics or environmental justice.

5.4 CULTURAL RESOURCES

Alternative 1 – No Action Alternative

The No Action alternative would continue to deteriorate the channel and it is unlikely the NFS would have the financial resources to make needed repairs and maintain the structure at a sufficient level to minimize flooding risks. It is anticipated deterioration would continue over time, resulting in the continued loss of the masonry wall's historical significance.

Alternative 4 – Combination of Repair and Replacement of Channel Walls and Replacement of Vehicular and Pedestrian Bridges

Section 106 of the National Historic Preservation Act (NHPA) requires Federal Agencies to coordinate with the Advisory Council on Historic Preservation (ACHP) before taking any actions which might affect historic properties. A property is one that is listed, or determined eligible for listing, on the National Register of Historic Places (NRHP). Cultural properties determined eligible for the NRHP are given the same consideration as properties actually listed in the NRHP.

Under the Section 106 process, and as identified in 36 CFR Part 800, USACE is required to mitigate for any adverse effect to an NRHP listed or eligible property. Because Alternative 4 calls for the complete removal of 0.89 miles of the existing NRHP eligible Gooding Canal, it is assessed as an adverse effect on the historic property. USACE has consulted with the Idaho SHPO and negotiated a Memorandum of Agreement (MOA) to address potential effects to the Gooding Canal (Appendix L). The negotiated mitigation would involve the installation of interpretive signage and kiosk to provide the public information on the construction of the canal, the work of the WPA, and use of locally quarried stone as a building material in the region. At least one of the WPA plaques from the vehicular bridges would be incorporated into the kiosk design. The final mitigation plan agreed to in the MOA would be incorporated into the project and completed during the design and implementation phase to minimize impacts to cultural resources to a level below significant.

5.5 CUMULATIVE EFFECTS

5.5.1 Introduction

NEPA and CEQ implementing regulations require Federal agencies to consider the cumulative effects of their actions. Cumulative effects are defined as "effects on the environment that result from the incremental effects of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions".

Resources only negligibly affected or unaffected include Greenhouse Gases/Air Quality, Vegetation, Wildlife / Endangered Species, Topography / Geology / Soils, Recreation, HTRW, and Agriculture /Prime and Unique farmlands / Land Use. These resources are not expected to contribute to cumulative effects when considering past, present, and reasonably foreseeable future actions. Resources that may have minor negative or beneficial effects are briefly evaluated in Section 5.5.6, below.

The primary goal of a cumulative effects analysis is to determine the magnitude and significance of the effects to the resource from the proposed action in the context of the effects of other past, present, and reasonably foreseeable future actions on the resource.

5.5.2 Geographic and Temporal Scope of Cumulative Effects Analysis

Guidance for setting appropriate boundaries for a cumulative effect analysis is available from CEQ (1997) and EPA (1999). Generally, the scope of the cumulative effects analysis should be broader than the scope of analysis used in assessing direct or indirect effects. “Geographic boundaries and time periods used in cumulative impact analysis should be based on all resources of concern and all of the actions that may contribute, along with the project effects, to cumulative impacts” (EPA 1999). The analysis should delineate appropriate geographic areas including natural ecological boundaries, whenever possible, and should evaluate the time period of the project’s effects.

The geographic boundary for the cumulative effects analysis includes actions taking place in the Little Wood River watershed. The timeframe of 85 years was identified based on an approximate construction start of the Gooding Channel in the 1930s. A timeframe of five years into the future has been considered. Only actions that are reasonably foreseeable are included. To be reasonably foreseeable, there must be a strong indication that an action/event will occur or be conducted.

5.5.3 Past Actions

The County of Gooding was established in 1913. The city of Gooding was established in 1907 on 160 acres owned by Frank Robert Gooding. Both the city and county were named after him. Mr. Gooding was an influential immigrant rancher and legislator born in Tilverton, England. Early railroad establishment in the area strongly influenced the development of the area around the Little Wood River. The site of the city was originally notable only as an Oregon Short Line railway station called “Toponis” built in 1883. The Toponis Post Office was built five years later in 1887. Toponis became the Village of Gooding in 1907 and was incorporated in 1908. The Village of Gooding became the City of Gooding in 1910.

The current Gooding Canal that runs through the city was constructed between 1937 and 1941. During construction, there was considerable realignment and straightening of the river channel. The WPA constructed the rectangular channel made of grouted and ungrouted hand-placed lava rock over the native lava rock riverbed. Vehicular bridges

were also constructed within that time. Since construction completion of the canal, there has been very little activity in the channel, except for routine maintenance and flood fighting activities. Some maintenance work to repair and patch sections of the wall has occurred over time, and approximately 120 feet of the wall was replaced with concrete in the 1990s.

The Gooding area has experienced a slow and steady increase in industrial/agricultural development since its establishment. The historic character of the city has been preserved in many ways and several properties within the city are listed in the NRHP. Historic regional effects can be attributed to the development of the city itself, regional agricultural development and associated practices, channel construction and maintenance, and the construction and operation of the Little Wood River Dam, located approximately or 66 miles upstream of Gooding.

Effects of Past Actions

Development within the watershed, including irrigation and agriculture, including grazing, have altered resources within the watershed. Construction of the canal and the Little Wood River Dam have also adversely effected resources within the watershed. It is noted that the Gooding Canal, which was funded by the WPA using workers employed by the CCC, has been determined eligible for listing on the NRHP. In addition, there are past effects from irrigation, agriculture, and the Little Wood River Dam that have also adversely effected resources within the watershed.

5.5.4 Present Actions

The use of the river for irrigation and agricultural practices continue to impact resources within the watershed. Standard ongoing operation, maintenance, and repairs to the canal walls, along with other modernization actions (infrastructure, roads, and utilities) nearby, continue to negatively affect the historic integrity of the canal structure. Flow effects also continue and exacerbate maintenance effects on the structure and the upstream dam. Operation and maintenance of the canal has led to deterioration, and repairs with modern materials and workmanship have contributed to integrity loss of the historic character of the structure. The City has invested considerable effort and resources to maintain the function and appearance of the canal. However, the ongoing deterioration of historic elements of the canal require a level of effort that exceeds the capacity of the City. Repairs incorporating appropriate materials and workmanship are increasingly burdensome and unattainable for the City, resulting in the diminished historic integrity of the canal and potential loss of historic significance.

5.5.5 Future Actions

USACE did not identify any future activities other than O&M of existing or proposed infrastructure in the project area that could influence or exacerbate the minor effects to resources noted in Section 5 through scoping or analysis. USACE identified minor effects (either negative or beneficial) to the following resources.

5.5.6 Cumulative Effects Evaluation for the Preferred Alternative

Cultural Resources: Demolition of the historic canal and bridges and replacement with modern materials and design considerations will constitute an adverse effect to the historic property.

The adverse effects of the proposed demolition and replacement with new structures would be mitigated through implementation of an MOA (Appendix L) in consultation and with concurrence of the Idaho SHPO. The mitigating actions within the MOA will minimize the effects to less than significant. There are no other effects to the historic canal and bridges that are known. It is not expected that there will be any significant adverse cumulative effects to cultural resources.

Fisheries and Aquatic Resources / Water Quality: There would be no effect to wildlife and endangered species. However, there would be minor impacts to aquatic resources, as noted in Section 5. BMPs would be implemented to minimize these effects, especially regarding potential effects from dewatering the channel during project construction. When considered with past and present river management and irrigation practices, effects to aquatic resources are anticipated to be less than significant. Similarly, effects to water quality would be minimized using BMPs, and there is not expected to be any significant effects in combination with other effects to this resource from past and present actions.

Noise: Work would result in temporary increase to noise levels caused by construction activities. Residents of nearby homes could experience impacts to comfort and well-being during the construction period. However, construction would be conducted primarily with smaller sized equipment between 7:30 AM and 7:00 PM and would occur primarily within the channel. Other than noise levels that are typical for a small city, such as traffic, there are not any other known sources of noise that would contribute to cumulative effects. Therefore, the cumulative effects from noise are expected to be less than significant.

Hydrology / River Hydraulics / Climate / Climate Change: USACE has identified that as a result of climate change, the future hydrology within the watershed is likely to be flashier. The Preferred Alternative in meeting the project purpose would result in long-term, beneficial effects for flood risk management to the area. These benefits are not expected to result in any cumulatively significant adverse effects to hydrology and river hydraulics within the watershed. The project is not expected to result in any significant cumulative adverse effects to climate or climate change.

Aesthetics: The effects to aesthetics are minor but long-term and would become more like the remainder of the concrete-walled channel downstream of the project area. The cumulative aesthetic effects to the regional are not significantly impacted with this added effect and the updated nature of the new channel walls and bridges would have offsetting positive aesthetic value, ensuring less than significant effects to aesthetic resources.

Transportation: The temporary minor effects of transportation disruption would add no long-term negative impacts to transportation needs in the area, and improvements to bridges could provide long-term minor benefits to disabled residents and other pedestrians.

Socioeconomics / Environmental Justice: There are no disproportional impacted populations to warrant cumulative effects analysis under environmental justice parameters. All population segments would benefit equally from the project flood risk reduction benefits.

SECTION 6 - RECOMMENDED PLAN

6.1 PLAN COMPONENTS

Based on the evaluation of the measures and alternatives developed for this ILR/EA, Alternative 4 is the Recommended Plan, also known as the Preferred Alternative under NEPA.

Specific features of Alternative 4 (Figure 6-1) include the following:

- Removal and replacement of the existing lava rock wall where it has severely deteriorated (approximately 0.6 miles).
- Repair of the wall in the reach upstream of Oregon Street (approximately 0.3 miles), where the existing wall is generally in good condition. Repair could include concrete patches or reconstruction of the existing wall, or replacement of the wall, depending on the severity of the deterioration.
- Replacement of five vehicular bridges (Nevada, Idaho, Montana, Wyoming, and Oregon Streets). The Main Street bridge does not cause channel constriction and will not be replaced.
- Replacement of three pedestrian bridges (two located between Nevada and Idaho Streets, and one between Main and Montana Streets). The pedestrian bridges will be updated to comply with Americans with Disabilities Act standards.

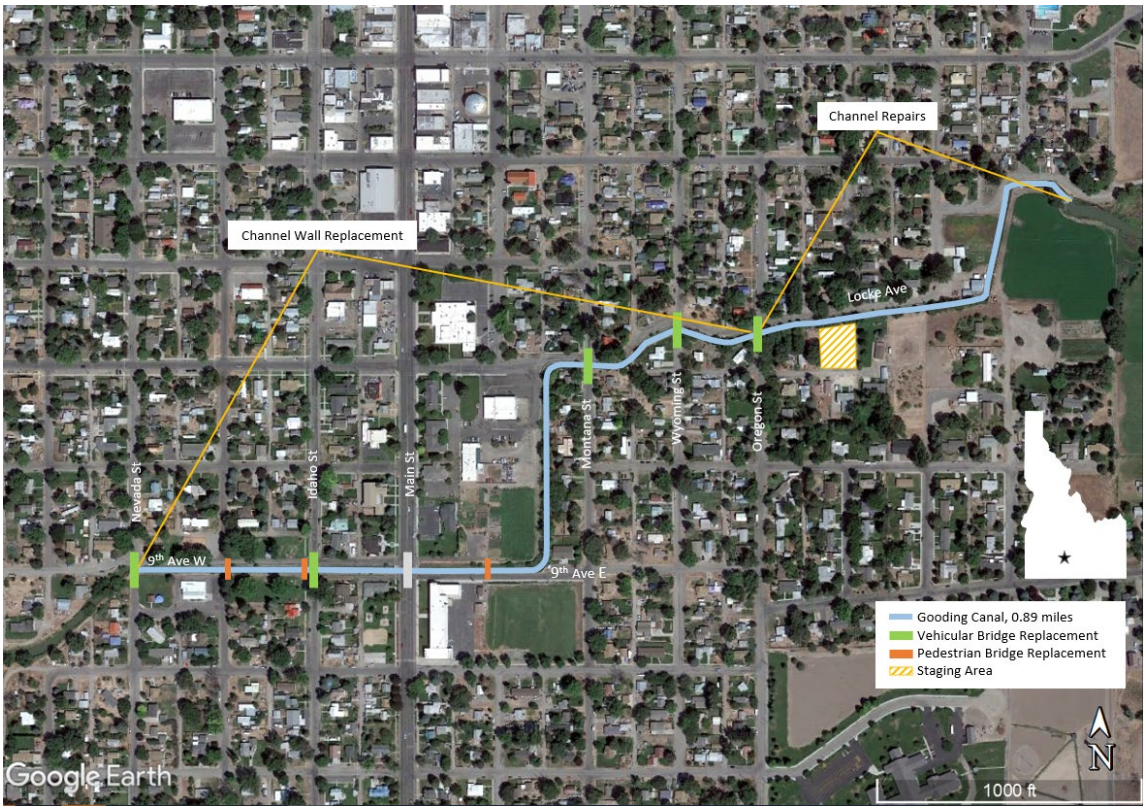

Figure 6-1. Recommended Plan Features

6.2 PLAN ACCOMPLISHMENTS

The Recommended Plan accomplishes the following:

- Improves channel capacity through the Gooding Canal by removing the pinch points at the bridge abutments during high water.
- Reduces local flood risk and damages that would result from channel wall failure and ice jams along the Gooding Canal.
- Reduces public safety risk from localized flooding and from channel egress difficulties.
- Reduces NFS O&M costs and responsibilities.

6.3 OPTIMIZING THE RECOMMENDED PLAN

Different versions of Alternative 4 were developed based on construction methodology and screened for the most acceptable methods to minimize both impacts to cultural resources and construction costs. Only methods that did not change the project footprint or impact existing traffic flow were evaluated; therefore, no channel reshaping or realignment was considered. Subsequently, four different methods were developed. These methods are discussed in detail in Section 6.4.

6.4 CONSTRUCTION METHODS

Four construction methods were developed and evaluated to determine the least-cost method for reconstruction of the channel walls where walls would be replaced. The four methods are described below (drawings are included in Appendix D):

- **Method A – Tied-Back Precast Concrete Panel Walls**

  Method A consists of using new precast concrete panels to replace the old channel walls. The existing bedrock channel bottom would remain unchanged. The existing walls would be removed, and little to no excavation beyond the existing walls would be required. Slopes would only be dressed enough to allow the panels to be installed. Since there is no need to increase capacity, only minimal soil would be removed. Anchored tendons would secure the concrete panel to the embankment, driven in at an angle that would not interfere with nearby private properties and require minimal soil removal. The bedrock at the toe of the panel would be removed to provide lateral restraint at the bottom of the panel. Precast walls would be tied into the new bridge abutments of the five bridges being replaced (Nevada, Idaho, Montana, Wyoming, and Oregon Streets) and the existing abutments for the Main Street bridge. The walls on the left and right banks would be placed to maintain a 24-foot channel width. Some type of fencing would be placed on top of the wall for safety purposes. Debris in the channel would be removed.

- **Method B – Tied-Back Sheet Piles**

  Method B is similar to Method A, with the exception that metal sheet piles would be used instead of precast concrete panels. Sheet piles would form the new channel wall and anchored tendons would secure the sheet pile to the embankment. The anchored tendons would be placed at an angle that would not interfere with nearby private property. The toe of the sheet pile would be secured with a rock bolt driven into the bedrock channel. Existing utilities would be surveyed prior to construction to avoid any potential conflicts. Some type of fencing would be placed on top of the wall for safety purposes. Debris in the channel would be removed.

- **Method C – Trenched Tied-Back Sheet Piles**

  Method C is the same as Method B, except that a trench would be created in the bedrock at the sheet pile toe, the sheet pile would be placed in the trench, and then filled with concrete. Existing utilities would be surveyed prior to construction to avoid any potential conflicts. Some type of fencing would be placed on top of the wall for safety purposes. Debris in the channel would be removed.

- **Method D – Stacked Concrete Blocks**

  Method D consists of a new channel wall constructed with stacked concrete blocks, each measuring 46 inches wide, 41 inches long, and 18 inches high. Anchored tendons would secure the blocks to the embankment. Some type of fencing would be placed on top of the wall for safety purposes. Debris in the channel would be removed.

Wall construction methods were chosen to improve channel wall integrity, maintain or improve existing channel conveyance, and minimize excavation. Construction materials such as concrete have a smoother surface than the existing lava rock face and will reduce friction and improve channel conveyance and flow velocity. The construction methods described above incorporate the least excavation possible to reduce impacts to private property.

Seismic events and the associated effects on the construction methods will be analyzed during the design phase. Channel wall features such as anchored tendon lengths are conceptual and will eventually be developed to accommodate seismic considerations. Final dimensions will dictate the construction footprint and the corresponding disturbance to private property and adjacent infrastructure. Striking a balance between relocating utility lines and constraining the construction footprint will be a key factor during the design analysis.

All construction methods provide the same level of flood protection; therefore, the least-cost method was used to determine a method for wall construction. The FY24 costs were annualized utilizing the FY24 Federal discount rate of 2.75 percent over a 50-year period of analysis with a base year of 2024 (50 years is considered the standard channel life), minimum 12-month construction period, and an estimated annual O&M cost of $5,000. The Federal discount rate, obtained annually from the U.S. Department of Treasury, discounts the costs over 50 years to convert future monetary values to

present values and convert benefits and costs to a common time basis. Table 6-1 depicts costs at the first quarter 2018 price level and then escalated to the first quarter 2024 price level using Engineer Manual 1110-2-1304, Civil Works Construction Cost Index System (CWCCIS) Quarterly Cost Index for Feature Code 09 Channels and Canals, September 30, 2023.

Table 6-1. Costs for Gooding Canal Rehabilitation

Method	Total Project First Cost	Average Annual Equivalent Cost
First Quarter FY 18 Price Level		
Method A	$13,586,786	$503,267
Method B	$14,422,311	$534,216
Method C	$14,207,412	$526,256
Method D	$28,132,070	$1,042,038
First Quarter FY 24 Price Level*		
Method A	$18,295,561	$691,184
Method B	$19,420,654	$733,381
Method C	$19,131,277	$722,528
Method D	$37,881,807	$1,425,776

*Reflects the inclusion of Real Estate Costs and removal of the bridge crossing replacement costs. Escalation via Civil Works Construction Cost Index System (CWCCIS) Quarterly Cost Indices for Feature Code 09 Channels and Canals, 30 SEPT 2023

Method A (Figure 6-2) was selected as the least-cost construction method in locations where the Gooding Canal walls would be replaced. A further refined estimate of Method A is included in Section 6.6, as well as in the Total Project Cost Summary in Appendix E, which includes costs for planning, design, and construction (including construction management). Additional analysis to be conducted during the design and implementation phase may determine that one of the other construction methods could be used in addition to Method A, depending on site conditions, costs, and other considerations. A value engineering study will be conducted prior to finalization of construction plans to determine the best construction methodology for least cost. A similar analysis may be applied to different methods of repair, though concrete patch has been used successfully in the past and is likely to be the method applied.

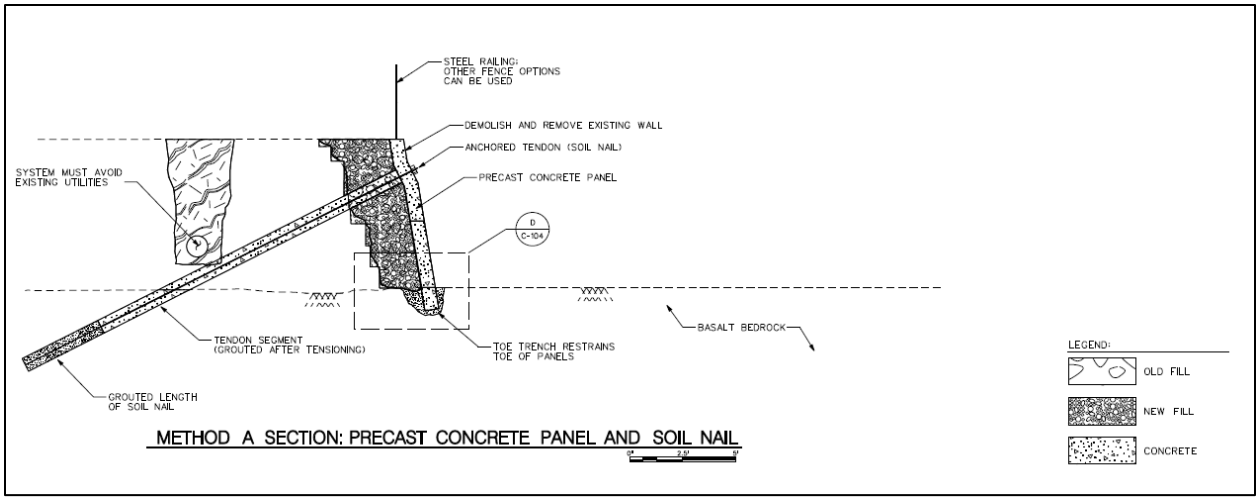

Figure 6-2. Method A – Tied-Back Precast Concrete Panel Walls

6.5 LIFE SAFETY

The localized flood risk is related to channel conditions and the reduced capacity in areas of channel wall deterioration and bridge crossings. Localized flooding causes damage to public and private infrastructure, but the Gooding Canal rehabilitation will reduce this flood risk. There is no increase to the threat to human life associated with Recommended Plan. A scaled risk assessment will be done during the design phase. The design phase will also include further refinement of the supporting features, such as hand-railing, fencing, and parapet walls.

6.6 COST ESTIMATE AND COST SHARE

A Cost Schedule Risk Analysis, which includes a risk register, was performed on the four different methods of construction, and the values are shown in Table 6-1. Refined FY24 costs for the Recommended Plan (Alternative 4, Combination of Repair and Replacement of Channel Walls and Replacement of Vehicular and Pedestrian Bridges, utilizing Method A, Replace Existing Channel Walls with Tied-Back Precast Concrete Panel Walls) are shown in Table 6-2. Cost estimates are based on a channel width of 24 feet, a depth of 8 feet, and the full length of 0.89 mile; however, the full length is not likely to be replaced. The Micro-Computer Aided Cost Estimating System (MCACES) estimate and Total Project Cost Summary sheet are included as Appendix E. Construction costs include a 37 percent contingency, which was developed from the risk register.

Upon approval of the ILR/EA and appropriation of funds, the design and construction phase will be conducted under the provisions of a Project Partnership Agreement. Per Section 8335 of WRDA 2022, cost share provisions were amended to be 90 percent Federal and 10 percent NFS. The LERRDs are 100 percent NFS responsibility, with Federal responsibility for oversight costs.

The estimated total project first cost for this plan is $36.8 million (FY24 price level). The Federal cost share is estimated to be $32.1 million, and the NFS cost share is estimated to be $4.71 million, as shown in Table 6-2.

Table 6-2. Costs Summary and Project Cost Share for Recommended Plan, Method A ($1,000s)

	Federal Costs	Non-Federal Costs	Total Costs
Design and Construction			
Construction minus Relocations	$23,580	$2,620	$26,200
Planning, Engineering, and Design (PED)	$5,520	$613	$6,133
Adaptive Management & Monitoring	$194	$22	$215
Construction Management	$2,911	$323	$3,234
Design and Construction Subtotal	**$32,010**	**$3,557**	**$35,567**
LERRDs	$42	$1,148	$1,190
Total Project First Cost	**$32,052**	**$4,705**	**$36,757**

FY24 OCT 2023 Price Level

Total project costs were annualized utilizing the FY24 Federal discount rate of 2.75 percent over a 50-year period of analysis with base year of 2024 (50 years considered to be the standard channel life), a minimum construction period of 12 months, and an estimated annual O&M cost of $5,000. The average annual equivalent cost is estimated to be $1.38 million, and the average annual costs with O&M is estimated to be $1.39 million, as shown in Table 6-3.

Table 6-3. Annual Costs of the Recommended Plan*

Average Annual Equivalent Costs	$1,383,590
Operations & Maintenance	$5,000
Average Annual Costs	**$1,388,590**

*FY24 OCT 2023 Price Level and 2.75 Percent Federal Discount Rate

A Section 902 limit was calculated and estimated to be $51.6 million at FY24 price levels. Total authorized cost used for calculation is $40,000,000, based on Section 8335 of WRDA 2022 (Table 6-4).

Table 6-4. 902 Limit Calculation; Maximum Cost Including Inflation through Construction ($1,000s)*

Current Project estimate at current price levels	$36,757
Current project estimate, inflated through construction	$38,639
Ratio: Line 1b / line 1a	1.05
Authorized cost at current price levels	$41,495
Authorized cost, inflated through construction	$43,619
Cost of modifications required by law	$0
20 percent of authorized cost	$8,000
Maximum Cost Limited by Section 902	**$51,619**

*FY24 OCT 2023 Price Level

6.7 LOCAL COOPERATION REQUIREMENTS

Federal implementation of the project for structural flood risk management includes, but is not limited to, the following required items of local cooperation to be undertaken by the NFS in accordance with applicable Federal laws, regulations, and policies:

a. Provide 10 percent of construction costs in accordance with the terms of the Project Partnership Agreement.

b. Provide all LERRDs. The Real Estate Plan (Appendix F) estimates that the NFS will need to acquire approximately 4 acres for Channel Improvement Easements (Standard Estate #8) along the channel, including 1.6 acres of Idaho State lands for O&M. The NFS has indicated their ability to obtain the necessary LERRDs reflected in the Recommended Plan, at reasonable costs.

c. Prevent obstructions or encroachments on the project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) that might reduce the level of flood risk reduction the project affords, hinder operation and maintenance of the project, or interfere with the project's proper function.

d. Inform affected interests, at least yearly, of the extent of risk reduction afforded by the flood risk management features; participate in and comply with applicable Federal floodplain management and flood insurance programs; prepare a floodplain management plan for the project to be implemented not later than 1 year after completion of construction of the project; and publicize floodplain information in the area concerned and provide this information to zoning and other regulatory agencies for their use in adopting regulations, or taking other actions, to prevent unwise future development and to ensure compatibility with the project.

e. Operate, maintain, repair, rehabilitate, and replace the project or functional portion thereof at no cost to the Federal government, in a manner compatible with the project's authorized purposes and in accordance with applicable Federal laws and regulations and any specific directions prescribed by the Federal government.

f. Give the Federal government a right to enter, at reasonable times and in a reasonable manner, upon property that the NFS owns or controls for access to the project to inspect the project, and, if necessary, to undertake work necessary to the proper functioning of the project for its authorized purpose.

g. Hold and save the Federal government free from all damages arising from design, construction, operation, maintenance, repair, rehabilitation, and replacement of the project, except for damages due to the fault or negligence of the Federal government or its contractors.

h. Perform, or ensure performance of, any investigations for HTRW that are determined necessary to identify the existence and extent of any HTRW regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9601-9675, and any other applicable law, that may exist in, on, or under real property interests that the Federal government determines to be necessary for construction, operation, and maintenance of the project.

i. Agree, as between the Federal government and the NFS, to be solely responsible for the performance and costs of cleanup and response of any HTRW regulated under applicable law that are located in, on, or under real property interests required for construction, operation, and maintenance of the project, including the costs of any studies and investigations necessary to determine an appropriate response to the contamination, without reimbursement or credit by the Federal government.

j. Agree, as between the Federal government and the NFS, that the NFS shall be considered the owner and operator of the project for the purpose of CERCLA liability or other applicable law, and to the maximum extent practicable shall carry out its responsibilities in a manner that will not cause HTRW liability to arise under applicable law.

k. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, PL 91-646, as amended (42 USC 4630 and 4655), and the Uniform Regulations contained in 49 CFR Part 24, in acquiring real property interests necessary for construction, operation, and maintenance of the project including those necessary for relocations, and placement area improvements; and inform all affected persons of applicable benefits, policies, and procedures in connection with said act.

The costs of LERRDs are a non-Federal responsibility and are discussed in Appendix F, Real Estate Plan. The Real Estate Plan estimates the NFS will need to acquire approximately 4 acres for Channel Improvement Easements (Standard Estate #8) along the channel, including 1.6 acres of Idaho State lands for O&M. The NFS has indicated their ability to obtain the necessary LERRDs reflected in the Recommended Plan, at reasonable costs.

6.8 OPERATIONS, MAINTENANCE, REPAIR, REPLACEMENT, AND REHABILITATION

All OMRR&R for projects constructed under Section 3057 of WRDA 2007 are a non-Federal responsibility. An O&M manual must be produced by USACE prior to the completion of construction to ensure proper care of the canal by the NFS. The estimated annual OMRR&R cost is expected to be between $2,000 to $5,000 for minor routine repairs, periodic repairs associated with small ice jams, and any regular clean-out or minor cosmetic repairs.

6.9 PROJECT RISKS

Areas of risk and uncertainty are analyzed and documented in a Cost Engineering risk register so that decisions can be made with knowledge of the degree of reliability of the estimated effectiveness of alternative plans. The PDT determined that in-depth quantitative analysis or modeling for this project would not change the outcome or the Recommended Plan. Areas of risk identified in the abbreviated risk analysis included bridge work, channel dewatering, and uncertainty associated with the removal of unknown and undocumented materials around the channel. To mitigate this risk, the cost estimate includes a 37 percent contingency for construction costs.

6.10 DESIGN AND CONSTRUCTION

Once fully funded, it is anticipated that design and construction of the Gooding Canal rehabilitation project would take a minimum of 24 months. A detailed construction schedule is included in the Total Project Cost Summary sheet located in Appendix E.

The first step in the design phase of this project will be to complete a survey of the channel. Concurrently, hydraulic modeling of the channel will begin. Using data from both the survey and the modeling, up-to-date designs will be created.

The designs found in Appendix C, Drawings, are of a very conceptual nature and are over 10 years old. It is unlikely that these designs will be used as the project moves towards construction. In addition, while four construction methods were evaluated, it is unknown at this time if any of those methods will ultimately be chosen. However, for this report, the least cost method was selected.

6.11 ENVIRONMENTAL COMMITMENTS

USACE will strictly adhere to the following environmental commitments as part of the Recommended Plan to ensure that impacts and effects that may result from the action are avoided or minimized. The following environmental commitments are an integral part of the preferred alternative.

General and Biological Commitments

Appendix G provides further information and explanation regarding the following BMPs.

1. Erosion control measures shall be properly installed and provide adequate coverage for disturbed areas or associated areas subject to construction-related runoff.
2. Spreading of excess materials shall be conducted in a way that eliminates the potential for any of the material to become airborne and enter surface water by any means, to include, but not limited to, runoff.
3. Reseed or replant disturbed areas, if any, with native materials and seed to minimize the invasion of noxious weed species and the subsequent use of pesticides, as well as runoff potential.
4. Avoid complete dewatering of river reaches to the extent feasible to reduce aquatic resource impacts.
5. Use best management practices to minimize potential impacts to wildlife.
6. Use best management practices to minimize potential impacts to vegetation.
7. Minimize the footprint of disturbance to the smallest area possible.
8. Avoid construction activities in the river channel between March 15 and July 15 to protect spawning and rearing fish species.
9. River flows should be gradually reduced to allow fish and wildlife to migrate to suitable habitat.
10. Stranded fish should be salvaged and relocated into suitable habitat.
11. Post-construction monitoring should be required to assess short- and long-term effects of dewatering.
12. Options for habitat-based mitigation (e.g., wetland habitat restoration and protection) should be considered based on the monitoring results.

Cultural Resources Commitments

USACE has consulted with the Idaho SHPO and negotiated an MOA to address project impacts (Appendix L). The negotiated mitigation will involve preparation of an interpretive panel and kiosk and survey of nearby historic properties, stipulated below. The final mitigation plan agreed to in the MOA will be incorporated into the project and completed during the design and implementation phase.

1. The City shall develop an interpretive panel or kiosk as part of the design phase of the larger project. The kiosk must incorporate one of the WPA plaques, found on the vehicular bridges, into its content. The content of the panel may also include one or all of the following themes: information about the channel itself, the WPA program that led to construction of the canal and bridges, or regional architecture using local available lava stone. The City shall provide the SHPO a period of at least 30 days to review any draft final content proposed under this stipulation. The City may retain any

additional WPA plaques it would like to for display and interpretive purposes. Any remaining WPA plaques not retained by the city at the time of demolition shall be removed and turned over to the Idaho State Historical Society, to be retained at the expense of the state.

2. USACE will oversee a historic property survey that will document no less than 50 publicly accessible historic-age properties (buildings, bridges, canals, etc.) that were constructed using the locally available "lava rock." The architectural survey will begin in the city of Gooding and continue into Gooding County with the goal of identifying at least 50 historic properties that have not been previously recorded. The following tasks will be completed:

1) A Secretary of the Interior (SOI)-qualified architectural historian performing a literature review within the Idaho Cultural Resources Information System (ICRIS) to identify previously recorded properties.
2) Prepare resource records within the ICRIS for each of the identified properties. Each of the required fields within the ICRIS will be completed, including locational information and a minimum of two photographs.
3) USACE will review the survey for completeness and to ensure that the survey meets the SHPO guidelines.
4) SHPO will review the survey and resource records within 45 days of submission.

3. USACE will oversee a historic property survey that will document any publicly accessible historic-age buildings located within the areas identified in the Gooding Survey Area (Appendix A of the MOA), which have not previously been recorded. For this survey the following tasks shall be completed:

1) An SOI-qualified architectural historian performing a literature review within the ICRIS to identify previously recorded properties.
2) Prepare resource records within the ICRIS for each of the identified properties within the survey area. Each of the resource record required fields within the ICRIS will be completed including locational information, a minimum of two photographs.
3) USACE will review the survey for completeness and to ensure that the survey meets the Idaho SHPO guidelines.
4) Idaho SHPO will review the survey and resource records within 45 days of submission.

4. All work under Stipulation 2 and 3 will be completed by a person or firm who meets SOI's Professional Qualifications for architectural history. If USACE, or its representative, cannot locate 50 lava rock structures within the County, USACE and SHPO shall have a meeting to identify nearby sites that may be appropriate. The SHPO will have 60 days to review the survey data and ask for revisions, if necessary.

6.12 PROJECT-SPECIFIC CONSIDERATIONS

Construction techniques for the demolition of existing walls and proposed wall construction are described from a feasibility-level perspective and are subject to change during design and implementation. There are five areas consistent to all methods, as described below (See Appendix G for additional considerations related to dewatering).

- **Staging** – The staging area needed to store materials and equipment for construction of the channel will be confined to approximately 0.50 acre. A site owned by the City of Gooding has been identified for this purpose (Figure 6-1 in Section 6.1). The staging area would be cleared and graded with a 4-inch layer of crushed rock to provide a useable working surface. If it is determined in the Planning, Engineering, and Design (PED)phase that additional land for staging is required, additional city property is available along the channel alignment.
- **Dewatering** – Part of the Little Wood River flow will be rerouted from the project site using the existing South Gooding Main Canal (as shown in Figure 5-13 in Section 5.1.2), so that the entire length of the canal within the project footprint is partially dewatered. Any remaining water would be piped or pumped through the specific areas being constructed so that construction occurs in dry conditions.
- **Work Window** – Construction must occur during the non-irrigation season (circa October 1 through March 14) to avoid impacts to irrigators. The existing walls on both sides of the channel will be demolished and then discarded at Gooding Industrial Park, about 0.75 mile from the project site. Refuse must be disposed of in a licensed landfill or other legal means. However, if the material is primarily rock from the canal walls, it could be stockpiled for future reuse.
- **Excavation** – Excavation will be minimized to the extent practical. Some material will be excavated behind the existing wall alignment along both sides of the entire canal length to allow for the proposed wall construction. The type of material behind the existing rock wall is unknown at this time, but it is likely to be primarily lava rock and old fill material, which will also be discarded at Gooding Industrial Park. After the proposed wall is installed, new fill material (most likely from a commercial source) will be placed and compacted behind the wall.
- **Access** – There is existing access to the channel for small construction equipment. The channel bottom is relatively smooth, which will allow equipment to be driven within the channel and on the adjacent road north of the Gooding Canal.

  Three pedestrian bridges cross the channel within the project reach. The bridges are used by students at the elementary school and the Idaho School for the Deaf and Blind. These bridges would need to be removed from their anchors prior to construction and replaced after the wall construction is completed. The bridges would not likely be removed at the same time.

6.13 ENVIRONMENTAL OPERATING PROCEDURES

USACE adopted seven Environmental Operating Principles (EOPs), which are to be considered in any undertaking. The intent of the EOPs is to ensure that USACE includes sustainable use, stewardship, and restoration of natural resources in decision making. The EOPs listed below relate to the human and natural environments and are intended to lead to more efficient and effective solutions through stewardship and collaboration.

- Foster a culture of sustainability throughout the organization.
- Proactively consider environmental consequences of all USACE activities, and act accordingly.
- Create mutually supporting economic and environmental solutions.
- Continue to meet corporate responsibility and accountability under the law for activities undertaken by USACE that may impact human and natural environments.
- Consider the environment in employing a risk management and systems approach throughout life cycles of projects and programs.
- Leverage scientific, economic, and social knowledge to understand the environmental context and effects of USACE actions in a collaborative manner.
- Employ an open, transparent process that respects views of individuals and groups interested in USACE activities.

As evidenced in this ILR/EA, USACE has applied these principals to inform and influence decisions throughout the study process. Environmental consequences were balanced with planning objectives; planning, legal, and technical constraints; and cost and economic considerations based on informed stakeholder input. External engagement processes are described in subsequent sections of this ILR/EA.

6.14 PLAN IMPLEMENTATION

The USACE implementation guidance (Appendix A) recommended that this project be implemented like a Section 205 CAP project. A deviated CAP Section 205 Project Partnership Agreement is being developed by USACE Headquarters. This agreement will be completed by the Walla Walla District and submitted through Northwestern Division to HQUSACE for approval, so the project can immediately begin the Design and Implementation Phase.

SECTION 7 - ENVIRONMENTAL COMPLIANCE

7.1 COMPLIANCE WITH APPLICABLE ENVIRONMENTAL LAWS, REGULATIONS, AND EXECUTIVE ORDERS

Table 7-1 identifies relevant environmental laws, regulations, and Executive Orders (EOs) and provides a brief statement summarizing how USACE will comply with the requirements. Appendices G (Biological Evaluation), H (Fish and Wildlife Coordination Act), I (Hazardous, Toxic, and Radiological Waste), J (Climate Change), K (Greenhouse Gas Evaluation) and L (NHPA MOA) have detailed information that support this section.

Table 7-1. Compliance with Applicable Environmental Laws, Regulations, and Executive Orders

Requirement	Compliance
National Environmental Policy Act (NEPA)	NEPA requires Federal agencies to use a systematic interdisciplinary approach to evaluate the environmental effects of a proposed Federal action prior to implementing that action. This is usually accomplished through preparation of a statement, either an Environmental Impact Statement (EIS) if the action is a major Federal action significantly affecting the quality of the human environment, or an Environmental Assessment if the Federal agency has not yet determined the significance of the effects. This ILR/EA was prepared pursuant to regulations implementing NEPA and identifies and considers the potential environmental effects of implementing the Recommended Plan (Combination of Repair and Replacement of sections of the Gooding Canal and associated bridges). USACE distributed this ILR/EA and the associated draft decision document, the Finding of No Significant Impact (FONSI), to other Federal and state agencies, Tribes, and the public for a 15-day review and comment period beginning on November 6, 2023. While preparing this ILR/EA, USACE did not identify any impacts that would significantly affect the quality of the human environment. One comment letter was received that requested consideration of updated cultural resource impact mitigation, which is incorporated in Appendix L, and asked that consideration for pedestrian access on vehicular bridges be considered. Such access will be considered in the planning, engineering, and design phase of the project implementation.

Endangered Species Act (ESA)	The ESA of 1973 established a national program for the conservation of threatened and endangered fish, wildlife, and plants and the habitat upon which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with the USFWS and NMFS, as appropriate, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their critical habitats. Section 7(c) of the ESA and the Federal regulations on endangered species coordination (50 CFR §402.12) require that Federal agencies prepare biological assessments of the potential effects of major actions on listed species and critical habitat. There are no ESA-listed species or designated critical habitat in the project area. Implementation of the Recommended Plan would have no effect on any ESA-listed species or designated critical habitat. No consultation is required. (See Appendix G.)
Fish and Wildlife Coordination Act (FWCA)	The Fish and Wildlife Coordination Act (FWCA) of 1934, as amended (16 USC 661 et seq.) requires consultation with USFWS when any water body is impounded, diverted, controlled, or modified for any purpose. The USFWS and state agencies charged with administering wildlife resources are to conduct surveys and investigations to determine the potential damage to wildlife and the mitigation measures that should be taken. The USFWS incorporates the concerns and findings of the state agencies and other Federal agencies, including the NMFS, into a report that addresses fish and wildlife factors and provides recommendations for mitigating or enhancing impacts to fish and wildlife affected by a Federal action. The FWCA was authorized on March 19, 1934, to authorize State and Federal agencies to work together to protect, rear, stock, and increase the populations of game and fur- bearing species. The Coordination Act amendments in 1946 and 1958 expanded the types of water projects requiring consultation with USFWS and with other water resource agencies for the purpose of protecting wildlife resources. USACE coordinated with the USFWS and Idaho Department Fish and Game (IDFG). IDFG advocates

	for preservation of the riverine connectivity as much as feasible during construction to minimize impacts, and offered recommendations that would assist in minimizing impacts to fish and wildlife from the proposed dewatering effort (See Appendices G and H). A verbal concurrence in support of IDFG recommendations was received from the USFWS (U.S. Fish and Wildlife Service, 2012). Documentation of the conversation is contained in Appendix G. The USFWS provided a letter dated June 12, 2017, stating, "given the lack of coordination during the initial planning stages for the action, and our need to facilitate your rapidly approaching decision milestones for this action, the Service agrees to forgo the consideration of such enhancement opportunities in regard to the proposed action."
National Historic Preservation Act	Section 106 of the National Historic Preservation Act (NHPA) requires agencies to consider the potential effect of their actions on properties that are listed, or are eligible for listing, on the National Register of Historic Places (NRHP). The NHPA implementing regulations, 36 CFR Part 800, requires that the Federal agency consult with the State Historic Preservation Officer (SHPO), Tribes and interested parties to ensure that all historic properties are adequately identified, evaluated, and considered in planning for proposed undertakings. Implementation of the Recommended Plan calls for the removal and replacement of the historic WPA/CCC lava stone channel, and removal and replacement of the historic bridges spanning the canal (also installed as part of the WPA/CCC Program). The removal and replacement of the canals and bridges was determined to be an "Adverse Effect" on a historic property. Therefore, USACE and the Idaho SHPO entered into a Memorandum of Agreement, dated December 2023, which defines a mitigation plan that would include design and construction of an interpretive kiosk, and the inventory of local historic structures and regional lava-stones historic features.
Clean Water Act (CWA)	The Federal Water Pollution Control Act (33 USC §1251 et seq., as amended) is more commonly referred to as the Clean Water Act (CWA). This act is the primary legislative vehicle for Federal water

	pollution control programs and the basic structure for regulating discharges of pollutants into waters of the United States (WOTUS). The act was established to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." The CWA sets goals to eliminate discharges of pollutants into navigable water, protect fish and wildlife, and prohibit the discharge of toxic pollutants in quantities that could adversely affect the environment. Section 404 of the CWA established a program to regulate the discharge of dredged or fill material into WOTUS and Section 401 requires that any Federal activity that may result in a discharge to WOTUS must first receive a water quality certification from the state in which the activity would occur. Implementation of the Recommended Plan (Combination of Repair and Replacement of sections of the Gooding Canal) requires compliance with the CWA. Section 404 requirements can be met with application of Nationwide Permit (NWP) #3 (Maintenance, to include the repair, rehabilitation, or replacement of any previously authorized, currently serviceable structure). Idaho Department of Environmental Quality (IDEQ) has denied certification for activities authorized under paragraph b of NWP 3 (the removal of accumulated sediments and debris outside the immediate vicinity of existing structures [e.g., bridges, culverted road crossings, water intake structures, etc.]). For Section 401 Water Quality Certification, USACE must abide by conditions placed on users of this NWP by the IDEQ. Individual certification would be required for the removal of channel sediments and debris to facilitate construction.
Clean Air Act (CAA)	The Clean Air Act (CAA) amended in 1977 and 1990 was established "to protect and enhance the quality of the nation's air resources so as to promote public health and welfare and the productive capacity of its population." The CAA authorizes EPA to establish the National Ambient Air Quality Standards (NAAQS) to protect public health and the environment. The CAA establishes emissions, hazardous air pollutants, and vehicles and other mobile sources. The CAA also

	requires the states to develop implementation plans applicable to particular industrial sources. The City of Gooding is located in an attainment area. Given the nature and location of the proposed rehabilitation, implementation of the Recommended Plan would have only temporary and minor effects on air quality due to the temporary operation of motorized vehicles and other construction equipment. Appendix K provides a greenhouse gas evaluation.
Wild and Scenic Rivers Act	The purpose of the Wild and Scenic Rivers Act is to preserve and protect wild and scenic rivers and their immediate environments for the benefit of present and future generations. It is notable for safeguarding the special character of these rivers, while also recognizing the potential for their appropriate use and development. The Little Wood River is not classified as a Wild and Scenic River; therefore, implementation of the Recommended Plan would not be subject to the Act
Migratory Bird Treaty Act (MBTA)	The Migratory Bird Treaty Act (MBTA) of 1918 implements four international conservation treaties that the U.S. entered into (Canada, Mexico, Japan, and Russia). It is intended to ensure the sustainability of populations of all protected migratory bird species The MBTA prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the USFWS. Section 704 of the MBTA gives the Secretary of the Interior authority to determine management measures required to ensure that any action taken is compatible with the protection of migratory bird species, according to distribution and population in the United States. Based on the timing of the construction activities associated with the Recommended Plan, there would be no effect to migratory birds or conflict with the purposes of the MBTA. (See Appendix G.)
Magnuson-Stevens Fishery Conservation and Management Act	The Magnuson-Stevens Fishery Conservation and Management Act (MSA) is the primary law governing marine fisheries management in the United States Federal waters.

	There is no Essential Fish Habitat within the Little Wood River. Given the location where construction would occur, the proposed project would not conflict with the purposes of the MSA. (See Appendix G.)
Executive Order (EO) 11988, Floodplain Management	This EO outlines the responsibilities of Federal agencies in the role of floodplain management. Each agency shall evaluate the potential effects of actions on floodplains and should avoid undertaking actions that directly or indirectly induce growth in the floodplain or adversely affect natural floodplain values. The Little Wood River through Gooding is located in the floodplain; however, the proposed project would not conflict with the purposes and goals of the EO.
Executive Order 11990, Protection of Wetlands	This EO encourages Federal agencies to take actions to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands when undertaking Federal activities and programs. The proposed project would not occur within a known wetland.
EO 12898, Federal Actions to Address Environmental Justice (EJ) in Minority Populations and Low-Income Populations	Executive Order 12898 requires Federal agencies to consider and address environmental justice by identifying and assessing whether agency actions may have *disproportionately high and adverse human health or environmental effects on minority and low-income populations.* Disproportionately high and adverse effects are those effects that are *predominantly* borne by minority and/or low-income populations *and* are appreciably more severe or greater in magnitude than the effects on nonminority or non-low-income populations. The proposed project would not have negative impacts (e.g., economically) on any minority and/or low-income communities. The improvements would benefit all Gooding residents, particularly those living adjacent to the canal.
EO 13985, Advancing Racial Equity and Support for Underserved Communities Through the Federal Government	This EO directs Federal agencies with advancing equity for all, including communities that have long been underserved, and addressing systemic racism in our Nation's policies and programs. By advancing equity, the Federal government can support and

	empower all Americans, including many communities in America that have been underserved, discriminated against, and adversely affected by persistent poverty and inequality. The proposed project would not result in racially inequitable action, restrict/limit access to benefits and opportunities through the Federal government, nor contribute to existing systemic barriers faced by underserved communities and their members. Section 3.6.2 provides further details.
EO 13166, Improving Access to Services for Persons with Limited English Proficiency	This EO requires each Federal agency to develop and implement a system to ensure that limited English proficiency (LEP) individuals can access the agency's Federally conducted programs and activities and is therefore important to EJ analyses under NEPA, as well to ensure affected portions of the public have full access to Federal information services provided by the NEPA process. The proposed action would not warrant additional effort to provide access to project information for those with limited English proficiency. Section 3.6.2 provides further details.
EO 13045, Protection of Children from Environmental Health Risks and Safety Risks	This EO directs Federal agencies to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children and ensure that their polices, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks. The proposed project would not adversely or disproportionately affect children nor result in environmental health risks or safety risks that would negatively impact children. Section 3.6.2 provides further details.
EO 14008, Tackling the Climate Crisis at Home and Abroad	EO 14008 places the climate crisis at the forefront directs Federal agencies to develop programs, policies, and activities to address the disproportionately high and adverse human health, environmental, climate-related, and other cumulative impacts on disadvantaged communities, as well as the accompanying economic challenges of such impacts.

	This EO also directed the White House Council on Environmental Quality (CEQ) to develop a geospatial mapping tool to identify disadvantaged communities. The Office of Management of Budget, CEQ, and the Climate Policy Office issued an Addendum to the Interim Implementation Guidance for the Justice40 Initiative, established by Section 223 of EO 14008. The Addendum directs Federal agencies to utilize the Climate and Economic Justice Screening Tool (CEJST) to identify disadvantaged communities that can be geospatially mapped, i.e., the individuals live in geographic proximity to one another. The CEJST was used to search the proposed action areas for disadvantaged communities that are marginalized, underserved, and overburdened, and identified census tracts in the area that exceeded both a burden threshold and an associated socioeconomic threshold. Considering each indicated burden, it was determined that the proposed action would not result in disproportionately high and adverse human health, environmental, climate-related, and other cumulative impacts on the community of Gooding, Idaho. Section 3.6.2 provides further details.
EO 11514, Protection and Enhancement of Environmental Quality	This EO requires Federal agencies to initiate measures needed to direct their policies, plans, and programs to meet national environmental goals established by NEPA and other environmental laws. It also requires Federal agencies to provide the public with information regarding any activity potentially affecting environmental quality and the quality of the human environment and obtain public opinion on these activities. Preparation of this ILR/EA, assessment of compliance with individual environmental laws, regulations, and EOs, along with provisions for public review and comment on the proposed project, meet the intent of EO 11514. The preferred alternative incorporates best management practices to minimize impacts to water quality and aquatic resources, as well as mitigation for cultural resource impacts.

7.2 PUBLIC INVOLVEMENT AND AGENCY AND TRIBAL COORDINATION

7.2.1 2010 Scoping Meeting

To announce the start of the feasibility phase, a public notice was issued to residents; Federal, state, and local agencies; and other interested parties. Recipients were invited to a scoping meeting, or workshop, hosted by the NFS on September 23, 2010. The intent of the scoping workshop was to present study information to interested parties and ask for their input and ideas regarding the scope of the study, to identify problems and opportunities, to brainstorm about possible alternatives for reconstructing the Gooding Canal, and any other issues that should be addressed or discussed.

Following is a summary of issues and concerns discussed:

- Ensuring the channel has capacity to contain a 1 percent AEP flood (100-year flood event).
- Widening or lengthening the bridges for unrestricted flow.
- Sloping channel walls and removing the flood wall.
- Potential work-in-kind to reduce NFS costs.
- Reducing maintenance costs to free up more of the city budget. Provide credit for work-in-kind to reduce the NFS's cost to complete the decision document.
- Reduce ice jams.
- Reduce flood insurance costs.
- Recreational opportunities:
    - Provide interpretive and educational amenities along the Gooding Canal.
    - Provide walking/bike path with benches along the channel.
    - Provide fishing access points/platforms.
    - Provide access and exit points for floating the river.
    - Provide additional pedestrian bridges for recreational purposes. Use historic rock in the design of recreation features for cultural preservation.

The scoping process resulted in the identification of some issues which were and are currently outside of the study authorization and therefore are not addressed in this project. The scoping process did not identify areas of high risk or controversy.

7.2.2 Past Document Reviews

In September 2016, USACE completed the *Draft Gooding Flood Control Project Little Wood River Integrated Rehabilitation Letter Report and Environmental Assessment* (Report/EA) and associated Draft Finding of No Significant Impact (FONSI) and released them for a 15-day public review. Two comment letters were received and addressed. However, USACE did not finalize the 2016 Report/EA, but upon receiving

additional authority in accordance with Section 8335 of WRDA of 2022, which provides for additional Federal funding and directed that the previously authorized project includes the removal of the five vehicle bridges, USACE revised and updated the documents (2023) in accordance with that authority. Therefore, the revised and updated FONSI, this ILR/EA along with all supporting appendices, was released on November 6, 2023, for a 15-day Federal, Tribal, state, public, and agency review and comment period. The documents were made available on the USACE Walla Walla District website, www.nww.usace.army.mil. One comment letter was received that requested consideration of updated cultural resource impact mitigation, which is incorporated in Appendix L, and asked that consideration for pedestrian access on vehicular bridges be considered. Such access will be considered in the planning, engineering, and design phase of the project implementation.

7.2.3 Agency and Tribal Coordination

This study was coordinated with the USFWS, in accordance with the Fish and Wildlife Coordination Act (FWCA), as well as with Idaho Department of Fish and Game (IDFG). The USFWS declined to participate formally in FWCA with USACE, either through a Planning Aid Letter or a Coordination Act Report (see Appendix H). Documentation of IDFG concerns is contained in the Biological Evaluation (see Appendix G). An environmental stipulation related to dewatering is included in Section 6.11.

In December 2021, USACE and the Idaho SHPO signed a Memorandum of Agreement (MOA) providing for stipulations designed to mitigate for the adverse effect to the Gooding Canal created by the proposed project. Currently, consultation with the Idaho SHPO is ongoing and an amended MOA to address potential project effects has been developed (see Appendix L). Specific stipulations are included in the MOA and have been incorporated into the Recommended Plan (see Section 6.11).

USACE did invite the participation of the Shoshone-Bannock Tribes of the Fort Hall Reservation in the development of the December 2021 MOA, and to sign the MOA as invited signatories, however the Shoshone-Bannock Tribes of the Fort Hall Reservation did not respond to that request.

As part of the current study process, the November 2023 Draft ILR/EA and associated documents will be made available to the Shoshone-Bannock Tribes of the Fort Hall Reservation on or about November 6, 2023, for a 15-day review and comment period. Previous comment periods included opportunities for tribal contribution; however, no input was received.

7.2.4 Local and Regional Interest

Reconstructing the Little Wood River Canal through Gooding is of high concern to the local population. Regionally, the major interest and/or concern revolves around irrigation supply and flood risk. The Little Wood River is an important source of irrigation water for the agriculturally based region. The Recommended Plan should not impact the current irrigation system or water rights holders. Although flood risk education outside the city of

Gooding has been the source of many studies in the area, regional flood risk reduction is outside the scope of this particular project.

7.2.5 Study Team

The Gooding Canal study team consisted of both local and Federal members and included representatives from the City of Gooding; Gooding County; the Region IV Development Association (a not-for-profit corporation whose mission is to encourage development and economic diversification in rural south-central Idaho); and USACE. Meetings were hosted by the NFS to facilitate communication between various groups. This diverse group and their involvement led to support for implementation of the Recommended Plan.

SECTION 8 - DISTRICT ENGINEER RECOMMENDATION

I have considered the environmental, social, and economic effects; the engineering feasibility; and the comments from other Federal and state resource agencies, Tribes, local governments, and the public contained in this Little Wood River, Gooding, Idaho, Integrated Letter Report and Environmental Assessment. I propose the Recommended Plan be implemented as a Federal project, under the authority of Section 3057 of WRDA 2007, as amended by Section 8335 of the WRDA of 2022. The Recommended Plan presented in this report is in the overall public interest, technically sound, environmentally acceptable, and the most cost-effective solution.

I have reviewed the anticipated benefits from implementation of the least-cost alternative plan to rehabilitate the Gooding Canal for purposes of flood risk reduction; and have considered the operation and maintenance determination, plan formulation, impacts identified, and overall scope. In my judgment, this project, as proposed, justifies expenditure of Federal funds. The estimated total project first cost of the Recommended Plan is $36.8 million (FY24 price level). This cost includes construction of the project features, planning and engineering design, and construction management. It is the responsibility of the NFS to provide all of the LERRDs necessary for construction, as well as OMRR&R, upon completion and turnover of the project.

The recommendations contained herein reflect the information available at this time, as well as current USACE policies governing formulation of individual projects. They do not reflect program and budgeting priorities inherent in the formulation of the national Civil Works construction program nor the perspective of higher review levels within the Executive Branch.

KINGSLACK.SHAILIN.YNACAY.1241230283
2023.12.15 17:08:14 -08'00'

SHAILIN KINGSLACK
Lieutenant Colonel, EN
Commanding

SECTION 9 - REFERENCES

CEQ (Council on Environmental Quality). (1997). Considering Cumulative Effects Under the National Environmental Policy Act.

EPA (Environmental Protection Agency) 1999. Consideration of Cumulative Impacts in EPA Review of NEPA Documents. U.S. Environmental Protection Agency, Office of Federal Actives.

FEMA (Federal Emergency Management Agency). (1985). Flood Insurance Study, Gooding County, Idaho, Unincorporated Areas.

IDEQ (Idaho Department of Environmental Quality). (2005). Little Wood River Subbasin Assessment and Total Maximum Daily Load. Twin Falls.

USACE (U.S. Army Corps of Engineers). (1965). Small Flood Control Project, Big Wood and Little Wood Rivers, Richfield-Gooding, Idaho - Reconnaissance Report. Walla Walla: USACE.

USACE. (1976). Big Wood River and Tributaries, Idaho - Feasibility Report for Flood Damage Reduction in the Vicinity of Gooding-Shoshone. USACE.

USACE. (1996, November). Planning Manual. Institute of Water Resources Report 96-R-21. USACE.

USACE. (1999). Engineer Regulation 1165-2-501, Civil Works Ecosystem Restoration Policy. USACE.

USACE. (2000(b)). Project Study Plan for Feasibility Phase Study of Little Wood River, Gooding, Idaho, under Section 416 authority. Walla Walla: USACE.

USFWS (U.S. Fish and Wildlife Service). (2012, February). Personal Communication with R. Kibler. USFWS.

USGS (U.S. Geological Survey). 1981. Guidelines for Determining Flood Flow Frequency, Bulletin #17B of the Hydrology Subcommittee. Edited March 1982.