

United States Department
of Agriculture



Forest Service

Bitterroot National Forest

May 2003

CANYON LAKE DAM AND WYANT LAKE DAM PROJECT

Final Environmental Impact Statement



Canyon Lake Dam

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

BITTERROOT NATIONAL FOREST

Final Environmental Impact Statement

Canyon Lake Dam and Wyant Lake Dam Project

Ravalli County, Montana

Responsible Agency

USDA Forest Service

For Further Information Contact

Elizabeth Ballard
Bitterroot National Forest
Stevensville Ranger District Office
Stevensville, Montana 59870
(406) 777-5461

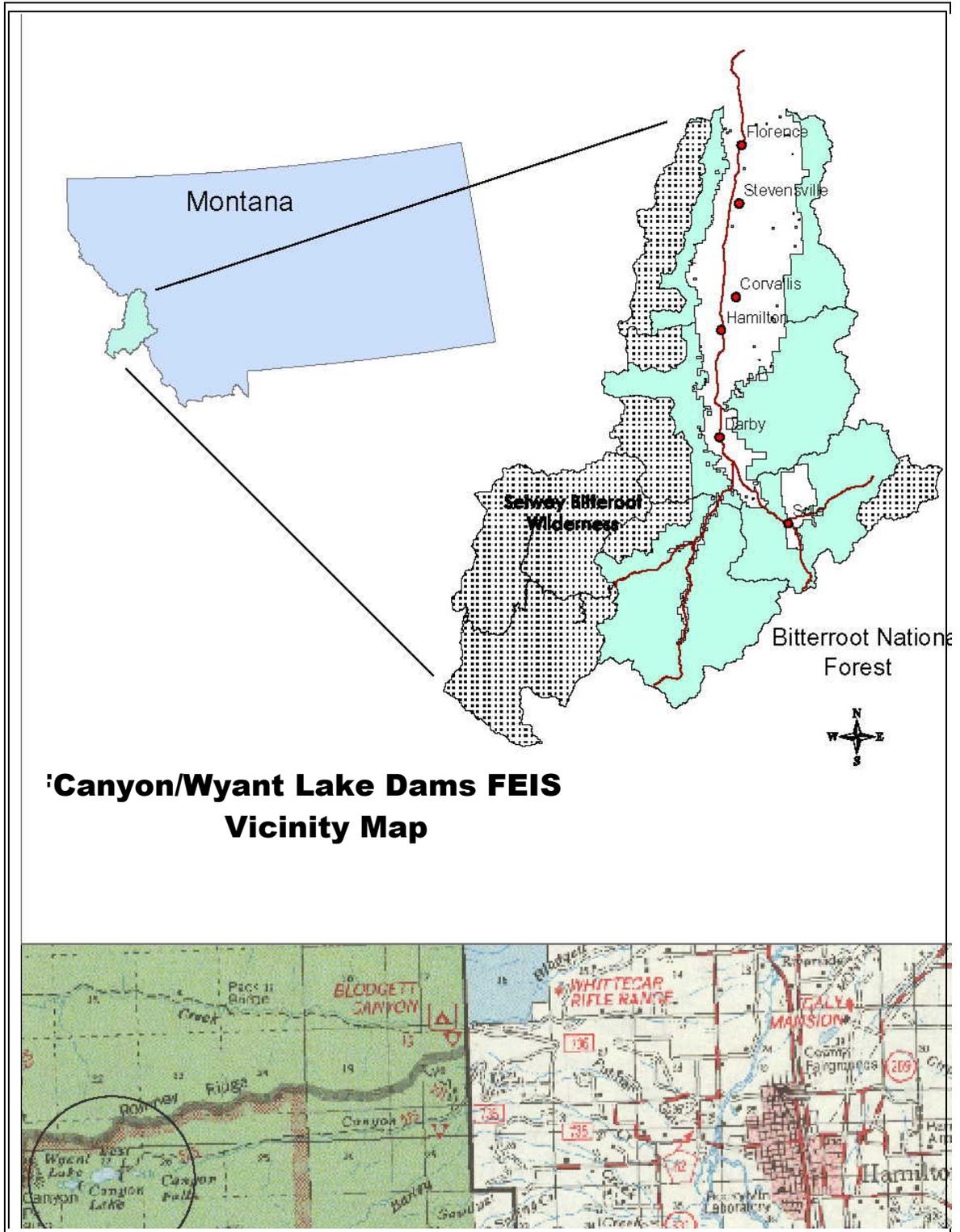
Abstract

The Forest Service proposes to authorize Canyon Creek Irrigation District (CCID) access to their easements at Canyon Lake Dam and Wyant Lake Dam, with certain terms and conditions, so that CCID may make these facilities safe and consistent with their responsibilities under the current federal dam safety laws and regulations, and consistent with their rights and responsibilities under the terms of their easements. Canyon Creek and Wyant Lake Dams are located in Section 27, T6N R22W, P.M.MT, which is approximately 8 miles west of Hamilton, Montana and entirely within the Bitterroot National Forest and the Selway Bitterroot Wilderness. Both Canyon Lake Dam and Wyant Lake Dam are classified as high hazard dams and have structural deficiencies that are in urgent need of repair.

This Final Environmental Impact Statement (FEIS) discloses and compares in detail the environmental effects of the proposal as well as two alternatives to the proposal. "Alternative 2" is the proposed action, wherein the Forest Service would authorize CCID sufficient helicopter access to allow for the necessary work to be completed at the dams. This alternative would also prescribe specific terms and conditions on that access and work to protect National Forest resources. Alternative 1 is the "No Action" alternative, wherein access would not be authorized. This alternative is beyond the statutory authority of the agency to select, but is considered and compared in the FEIS as required by law. Alternative 3 would authorize helicopter transport only for equipment and materials too heavy or awkward to transport safely with stock. Canyon Creek trail would be reconstructed to safely accommodate pack stock and a new trail would be constructed between Canyon and Wyant dams. Alternative 3 would also prescribe specific terms and conditions on that access and work to protect National Forest resources.

Copies of this FEIS are available in paper format from the Bitterroot National Forest Supervisors Office in Hamilton, Montana or may be viewed or downloaded in electronic format from the Internet at <http://www.fs.fed.us/r1/bitterroot/planning/decisiondocs/decisiondocs.html>.

Map 1



SUMMARY OF CHANGES MADE BETWEEN THE DRAFT AND FINAL EIS

Changes have been made to this EIS based on information provided by CCID, and review of the DEIS by both the public and within the agency. The following are the substantive changes that were made in response to comments received on the Draft Environmental Impact Statement (DEIS).

Supplement, Improve or Modify Analysis**Development and Analysis of a New Option D.**

Appendix A has been updated to include details of Option D. Option D has been included in the specialist's analysis of effects.

Mitigation Measures have been Modified

Many mitigation measures were updated, and some were added. P. 2-7 to10.

Summary of Minimum Requirements Process

Appendix F has been added, to include a summary of the minimum requirements analysis process

Throughout the document edits have been made to more accurately reflect the purpose and need, issues, alternatives analyzed and effects analysis.

Required Permits

Required permits have been added. P. 3-27.

Public Comments:

In the Final EIS, Chapter 6 documents responses to comments made by the public and other agencies after their review of the DEIS.

FINAL ENVIRONMENTAL IMPACT STATEMENT
BITTERROOT NATIONAL FOREST
CANYON LAKE DAM AND WYANT LAKE DAM PROJECT

TABLE OF CONTENTS

| | <u>Page</u> |
|---|-------------|
| ABSTRACT | |
| MAP 1 | M-1 |
| SUMMARY OF CHANGES BETWEEN DEIS AND FEIS | SC-1 |
| CHAPTER 1: PURPOSE AND NEED | 1-1 |
| Introduction | 1-1 |
| Purpose and Need | 1-2 |
| Proposed Action | 1-5 |
| Scope of the Decision and Decision to be Made | 1-5 |
| MAP 2 | M-2 |
| CHAPTER 2: ISSUES AND ALTERNATIVES | 2-1 |
| Introduction | 2-1 |
| Scoping and Public Involvement | 2-2 |
| Comments on the DEIS | 2-2 |
| Issues | 2-2 |
| Key Issues | 2-3 |
| Development of Alternatives | 2-4 |
| Alternatives Considered in Detail | 2-4 |
| Mitigation Measures, Terms and Conditions, and Permits | 2-6 |
| Environmental Monitoring | 2-11 |
| Alternatives Considered But Not Given Detailed Study | 2-12 |
| Comparison of the Effects of the Alternatives | 2-14 |
| CHAPTER 3: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES | 3-1 |
| Introduction | 3-1 |
| Human and Wilderness Environment | 3-1 |
| Dams and Dam Safety | 3-1 |
| Wilderness, Trails and Recreation | 3-7 |
| Heritage Resources | 3-18 |
| Economics | 3-20 |
| Physical Environment | 3-23 |
| Water Resources | 3-23 |

| | |
|--|------|
| Biological Environment | 3-39 |
| Fisheries | 3-39 |
| Sensitive Plants and Noxious Weeds | 3-50 |
| Wildlife | 3-56 |
| | |
| CHAPTER 4: CONSULTATION, COORDINATION, AND PREPARATION | 4-1 |
| Public Participation Summary | 4-1 |
| Public Participation Implementation | 4-1 |
| Criteria and Methods by which Public Input is Evaluated | 4-3 |
| Consultation with Others | 4-3 |
| List of Preparers and Reviewers | 4-3 |
| | |
| CHAPTER 5: REFERENCES | 5-1 |
| | |
| CHAPTER 6: RESPONSE TO COMMENTS ON THE DEIS | 6-1 |
| | |
| APPENDIXES | |
| Appendix A: Condition of Canyon and Wyant Lake Dams and Canyon Creek Irrigation District's Proposed Work to Address Dam Safety Requirements | |
| Appendix B: History of Canyon and Wyant Lake Dams | |
| Appendix C: Authority to Regulate Dams on National Forest System Lands | |
| Appendix D: Canyon Lake Dam site plan, Exhibit A, Montana Renewable Resource Grant and Loan Program Application for the Canyon Lake Dam Rehabilitation, May, 2000, prepared by Canyon Creek Irrigation District, c/o DJ Engineering | |
| Appendix E: Wyant Lake Dam site plan, Exhibit A, Montana Renewable Resource Grant and Loan Program Application for the Wyant Lake Dam Rehabilitation, May, 2000, prepared by Canyon Creek Irrigation District, c/o DJ Engineering | |
| Appendix F: Minimum Requirements Process Summary | |

CHAPTER 1

PURPOSE AND NEED

INTRODUCTION

Overview

The Forest Service proposes to authorize Canyon Creek Irrigation District (CCID) access to their easements at Canyon Lake Dam and Wyant Lake Dam, with certain terms and conditions, so that CCID may make these facilities safe and consistent with their responsibilities under federal dam safety laws and regulations, and consistent with their rights and responsibilities under terms of their easements.¹ This final environmental impact statement (FEIS) considers the effects of this and alternative authorizations.

The purpose and need for the project stems from Canyon Creek Irrigation District's existing rights and obligations to maintain Canyon and Wyant Dams consistent with federal dam safety standards and other pertinent laws and regulations which also govern CCID's use of their easements and the protection of National Forest System lands. Appendix C lists the authorities through which the Forest Service regulates dams on National Forest lands.

Canyon and Wyant Lake Dams are owned and operated by Canyon Creek Irrigation District (CCID). CCID has requested access to their easements at Canyon Lake and Wyant Lake Dams on the Bitterroot National Forest, Darby Ranger District. The irrigation district is authorized to maintain and operate these dams under valid pre-Forest easements recognized under the Act of 1866 and the Act of 1891 granted by the Secretary of the General Land Office/ Department of Interior. (Project File (PF) 1.1). Both easements are entirely within the National Forest boundary as well as within the Selway Bitterroot Wilderness.

Both Canyon Lake Dam and Wyant Lake Dam are classified as high hazard dams. This classification is based on the potential consequences if the structure(s) fails, based on risks to downstream life and property. Failure of either structure would "likely result in loss of human life or excessive economic loss", FSM 7511.2. Because of the progressive deterioration of both dams, there is a sense of urgency to complete the work in an efficient manner as soon as possible to ensure protection of wilderness resources and public safety.

As the dam owner, CCID is responsible for repair and maintenance of Canyon and Wyant Lake dams. Both dams currently have structural and design deficiencies that the CCID must correct to comply with the dam safety laws and regulations. Please refer to Appendix A for a description of the condition of Canyon and Wyant Lake dams and CCID's proposed work on those dams.

¹ Refer to Appendix C for a list of the authorities through which the U.S. Forest Service regulates dams on National Forest lands.

Background

Canyon Creek and Wyant Lake Dams are located in Section 27, T6N R22W, P.M. Mt., which is approximately 8 miles west of Hamilton, Montana. Both dams lie just inside the Selway-Bitterroot Wilderness boundary at the head of Canyon Creek. Canyon Lake Dam is approximately 5 miles from the Canyon Creek Trailhead. Wyant Lake Dam is located less than one mile upstream of Canyon Lake Dam (Map 1 and Map 2). Canyon Lake Dam is currently approximately 21.5 feet high and 430 feet long, and stores between 420 and 450 acre-ft of water. Wyant Lake Dam is approximately 18 feet high and stores about 54 acre-feet.

Public access to Canyon Lake is currently by Trail #525, which ascends over 2400 feet in 5 miles to the cirque where Canyon Lake is located. This steep trail, which crosses over boulder talus below the lake, has been administered for non-motorized access since the establishment of the Selway-Bitterroot Wilderness in 1964. This trail is not recommended for stock use. Reconstruction would be needed to make it safe for stock. There is no maintained trail to Wyant Lake.

PURPOSE AND NEED:

The purpose of this proposal is to authorize CCID adequate access² to their facilities and to prescribe terms and conditions related to this access and their subsequent work on the facilities as necessary to protect the National Forest.

The Forest Service is required by both the Wilderness Act³ and the Alaska National Interest Lands Conservation Act⁴ (ANILCA) to authorize access to valid occupancies such as these easements held by the CCID. Therefore, the authorization of adequate access to CCID for the valid use of its easements is non-discretionary.

In this case, the Wilderness Act also requires the Forest Service to “prescribe the routes of travel to and from the surrounded occupancies, the mode of travel, and other conditions reasonably necessary to preserve the National Forest Wilderness”. As such, the Forest Service has the responsibility to set reasonable terms and conditions on that access as necessary for protection of the National Forest.⁵

These acts prescribe a narrow scope to the Agency’s discretion, balanced between requirements to allow for the proponent’s rights and responsibilities pertaining to the use

² Defined at FSM 2320.5.15 as “The combination of routes and modes of travel that the Forest Service has determined will have the least-lasting impact on the wilderness resource and, at the same time, will serve the reasonable purposes for which State or private land or right is held or used.”

³ Wilderness Act, Sec. 5(b); codified at 16 U.S.C § 1134; and the implementing regulations at 36 CFR 293.13 Access to Valid Occupancies.

⁴ ANILCA, Pub. L. 96-487, title XIII, Sec. 1323; codified at U.S.C. § 3210

⁵ Concomitantly, the Forest Service also has authority under its general grant from Congress to protect the National Forests (16 U.S.C. § 551) to regulate reasonably the easement in order to achieve the purposes for which the national forests were reserved, and the Selway-Bitterroot Wilderness was designated.

of their easement and the Agency's responsibility to provide protections for National Forest and Wilderness values.

A number of factors help define and narrow the Agency's discretion in this case, and therefore they also define the scope and purpose of this proposal and are discussed further below.

Both Canyon and Wyant Dams have structural and design deficiencies that the CCID must correct to comply with the requirements of dam safety laws and regulations. The nature of known deficiencies, the downstream risks, and uncertainties associated with the internal structure and integrity of these older dams increase the urgency that known deficiencies be corrected as soon as possible. See Appendix A for a discussion of known deficiencies in Canyon and Wyant Lake Dams.

At the end of each field season, it is important that any corrective measures, including erosion control and armoring of the embankment, be completed to the extent that the dam can withstand the following winter conditions and spring runoff or precipitation events.

CCID has requested access to their Canyon Lake and Wyant Lake facilities so they may perform work necessary to meet the requirements of federal dam safety standards. They intend to permanently breach the Wyant Lake dam. CCID has decided to partially breach its Canyon Lake facility in 2003 and reconstruct the facility in 2004.⁶ Both courses of action could meet CCID's responsibilities under dam safety laws and regulations.

The Forest Service has reviewed the CCID's preliminary technical proposal and request for access and has determined that:

1. The CCID's proposed use is consistent with the purpose, terms and limits of the easement. Act of 1866, Section 9 states: "And be it further enacted, that whenever, by priority of possession, rights to use of water for mining, agricultural, manufacturing, or other purposes, have vested and accrued, and the same are recognized and acknowledged by the local customs, laws, and decisions of the courts, the possessors and owners of such vested rights shall be maintained and protected in the same; and the right of way for the construction of ditches and canals for the purposes aforesaid is hereby acknowledged and confirmed." The Act of March 3, 1891 (26 Stat. 1101, as amended; 43 U.S.C. 946-949 states: "to the extent of the ground occupied by the water of any reservoir and of any canals, and laterals and fifty feet on each side of the marginal limits thereof, and, upon presentation of satisfactory showing by the applicant, such additional right-of-way as the Secretary of Interior may deem necessary for the proper operation and maintenance of said reservoirs, canals, and laterals; also the right to take from the

⁶ See Appendix A for detailed description of CCID's intended work. The decision to repair or breach the dams is solely within the discretion of CCID. The Forest Service can only require that the facilities be consistent with safety standards. In this case, CCID has proposed to meet those standards on the Wyant facility by breaching instead of repair. This would ultimately lead to CCID relinquishing their easement for the Wyant facility.

- public lands adjacent to the line of the canal or ditch, material, earth, and stone necessary for the construction of such canal or ditch:”.
2. Review of the preliminary technical plans indicates the final plans could meet requirements under dam safety laws and regulations.⁷
 3. Based on preliminary environmental review by the interdisciplinary team, it appears the irrigation district’s proposed plans are, or could be made consistent with environmental laws.⁸ The interdisciplinary team developed the proposed terms and conditions based on this preliminary environmental review (p.2-6 to 2-10).
 4. A minimum requirements process was used to assist with the analysis of CCID’s request.⁹ The process indicates the proposal would meet Region 1 requirements for authorization to use mechanized transport and/or motorized tools within wilderness¹⁰ (PF 1.2 and Appendix F- Summary of the minimum requirements process).

⁷ The Forest Service is the agency responsible for regulating these two dams under the current dam safety laws and regulations. In this role, the agency reviews and approves (or disapproves) the irrigation districts engineering plans. The plans must meet strict dam engineering standards, considering, amongst other things, design, choice of materials, methods of placing materials, and the risks and uncertainties inherent in the existing structure. It is the irrigation district’s responsibility to develop the engineering plans.

⁸ These include the Clean Air Act, Clean Water Act, Endangered Species Act, Historic Preservation Act, National Forest Management Act, etc.

⁹ The Minimum Requirement Decision Process was developed by federal agencies to help provide consistency to the way project proposals in wilderness are evaluated. This decision guide is a means to document the analysis process.

¹⁰ Regional Forest Service Manual Supplement 2300-98-1 requires proposals for use of mechanized transport to be evaluated based on the “minimum tool” necessary to accomplish the project and that one or more of the following conditions be met in order to approve requests for use of motorized transport or mechanized tools in association with wilderness dams:

1. Emergencies (Immediate threat to life and property)
2. Where impacts to wilderness/resources would be greater using non-motorized/non-mechanical methods
3. Where physically infeasible to use non-motorized methods
4. When costs make the use of primitive tools infeasible.

PROPOSED ACTION

The U.S. Forest Service proposes to authorize the Canyon Creek Irrigation District access to their facilities with the terms and conditions described in further detail as Alternative 2. The Forest Service would authorize sufficient helicopter access to allow for the work to be done at Canyon and Wyant Lake Dams.

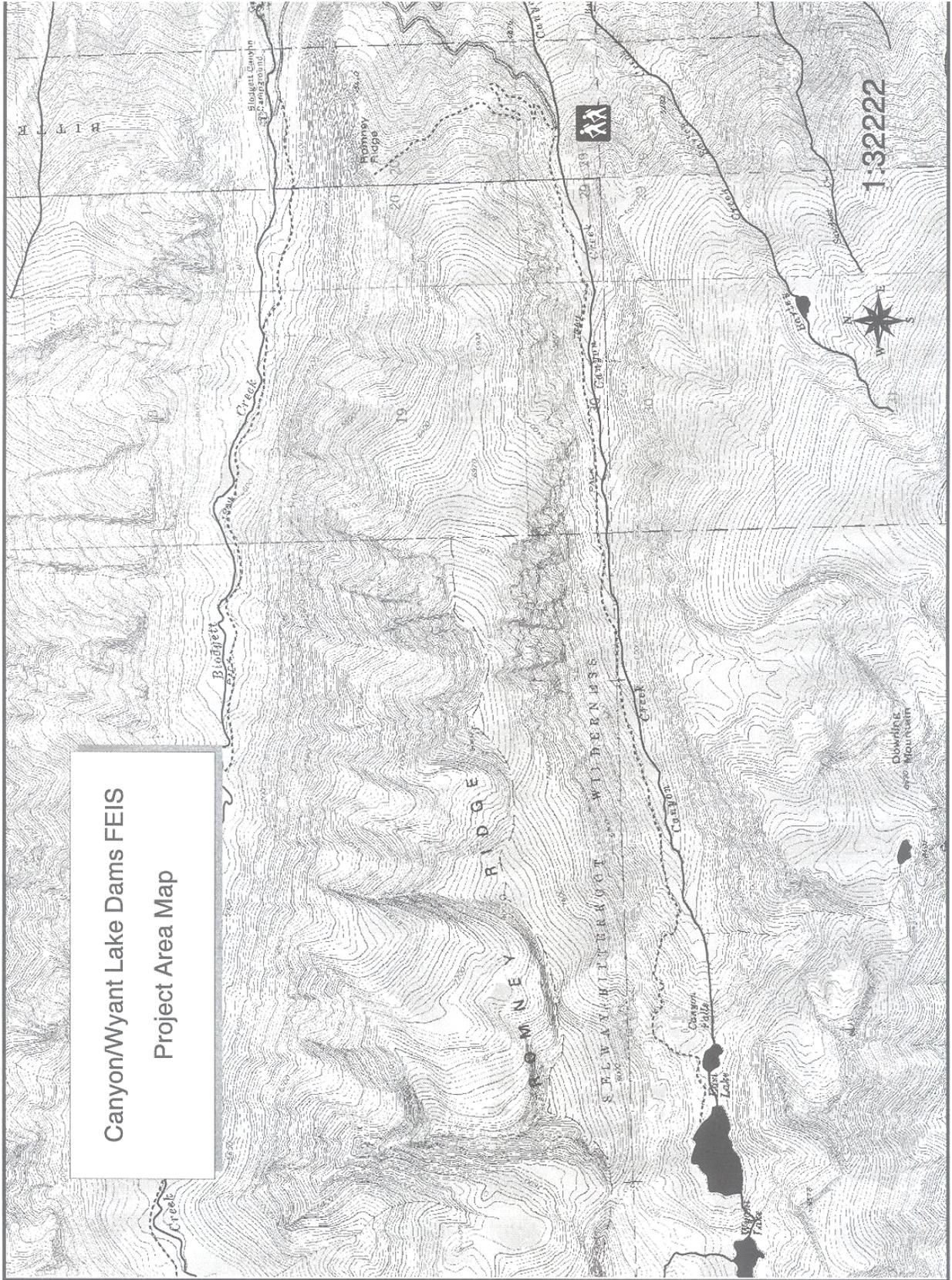
The Forest Service also proposes to require conditions be met during the irrigation district's repair, maintenance, and breach activities within the Wilderness and National Forest boundaries. These conditions address resource concerns such as sedimentation, safety and wilderness. They are listed in Chapter 2 as mitigation measures, terms and conditions and permits required for Alternative 2.

SCOPE OF THE PROPOSAL AND DECISION TO BE MADE

The Canyon Creek Irrigation District has requested authorization for access to their easements at Canyon and Wyant dams. CCID requests this authorization so they may perform work necessary to correct deficiencies that could potentially negatively affect public safety and the environment, consistent with their responsibilities under dam safety laws and regulations and their existing rights and responsibilities under their easement. This Forest Service proposal is limited to authorizing adequate modes and routes of access necessary for CCID to perform their specified work and any reasonable conditions of access and operations necessary to protect the National Forest (see Appendix A for further descriptions of their proposed work).

It should be noted, in anticipation of these questions, that the Forest Service cannot decide for or direct CCID to permanently breach either of these dams. That decision lies solely with CCID, as that decision affects their basic rights under the easements.

Based on the environmental analysis in this Final Environmental Impact Statement and after considering public and agency's comments, the Forest Service will decide which modes and routes of access to authorize CCID. The agency will also decide which, if any, terms and conditions on CCID's access and proposed work are necessary to protect the National Forest.



CHAPTER 2

ISSUES AND ALTERNATIVES

INTRODUCTION

Chapter 2 outlines the public scoping process that led to the identification of environmental issues around which alternatives were developed. Key issues raised by the public or Forest Service personnel led to the consideration of design requirements, mitigation measures, and alternatives to the proposed action. Alternatives that were considered and dismissed are explained later in this chapter. Chapter 2 describes the alternatives considered in detail.

Chapter 4 discusses public participation process in further detail.

SCOPING AND PUBLIC INVOLVEMENT

The National Environmental Policy Act (40 CFR 1501.7), hereafter referred to as NEPA, identifies scoping as an integral part of the alternative development process. Scoping is the process used to identify specific issues of concern that will be addressed during detailed environmental analysis of the proposed action. The Forest Service appointed an Interdisciplinary Team (IDT) to coordinate the scoping process within the Forest Service, to request public involvement in the scoping process, and to later develop alternative actions keyed to the final list of issues.

Scoping for the Environmental Impact Statement incorporates all public contacts made during 2001 and 2002. Abbreviated versions of the mailing list for the Bitterroot National Forest was used for government agencies, individuals interested in Forest activities, and the media. The following letters and news releases were sent, and notices published in newspapers:

Notice of Intent to Federal Register

Notice of intent to prepare an environmental impact statement was listed in the Federal Register on June 18, 2001.

News releases and Mailings

Letters to interested individuals, groups and government agencies:

1. A public scoping letter was mailed to approximately 119 individuals, organizations and agencies on June 12, 2001. This list was compiled from those who have expressed interest in this type of project in the past. Thirty days were provided for public comment.
2. A legal advertisement for scoping was placed in the Ravalli Republic, the newspaper of record for the Bitterroot National Forest. Legal notices were also placed in the Bitterroot Star and the Missoulian newspapers, which was published June 18, 2001.

3. The DEIS was made available for public review after a notice of availability was published in the Federal Register on January 17, 2003. The notice initiated a 45-day comment period (which closed on March 3, 2003). A notice of availability of the DEIS and request for comments was mailed to all individuals on the mailing list and posted on the Bitterroot National Forest's webpage on January 7, 2003. A legal notice, request for comment on the DEIS, was posted in the Ravalli Republic newsletter on January 9, 2003.

Internal and External Agency Involvement

Internal scoping involved meetings with key people on the Darby/Sula Ranger District, the Supervisor's Office and the North Zone Interdisciplinary Team.

A field review of the proposed action was held on August 7, 2001, at Canyon Lake Dam and Wyant Lake Dam. Interdisciplinary Team members, representatives from the Regional Office, and the CCID engineer were present.

As required by the National Historic Preservation Act, the National Environmental Policy Act, and the American Indian Religious Freedom Act, consultation with Native Americans was conducted. The Flathead Culture Committee, who represent the Confederated Salish and Kootenai Tribes, were consulted.

The Fish and Wildlife Service has been contacted concerning Threatened and Endangered species.

The Montana Natural Heritage Program was contacted concerning species of special concern.

COMMENTS ON THE DEIS

25 letters, or phone calls were received as comment on the DEIS. Chapter 6 of the FEIS contains the letters and USFS responses. These comments were used to supplement, improve or modify the analysis or to make factual corrections.

ISSUES

Both the public and personnel from the Forest Service and other agencies raise issues about proposed activities. Some of these issues drive the development of other alternatives to the proposed action. Other issues are related to specific resources that are protected by state or federal laws. Measures to protect these resources, including Best Management Practices (BMPs), are normally already in forest plan standards and guidelines and would be met by all action alternatives to reduce or eliminate effects on the resource. Therefore, net effects on the resource would be limited and may be relatively the same for all alternatives. Effects of the alternatives relative to these issues may be discussed in Chapter 3, although typically not in as much detail as more significant issues.

Other issues may be outside the scope of the proposed action. They are either irrelevant to the decision, already decided by the forest plan, beyond the geographic influence of the proposal, or have nothing to do with the proposal. These issues are dropped from further analysis.

Some issues arise where there may be varying effects on resources. These effects may not necessarily be significant enough to design an alternative to address the issue. These issues are addressed in the environmental effects in Chapter 3 and may be pertinent to the decision. As an example, water resource impacts were not considered a key environmental issue because the analysis suggests effects would be successfully mitigated during implementation. However, water resource effects and mitigation discussion is included due to overall public interest in water quality.

Issues that are controversial or represent unresolved conflicts are evaluated in detail. They may be used to identify alternatives to the project or specific components. These issues are called key issues.

Issues arising from Scoping and Analysis

Persons, agencies or groups who commented during scoping included: Doris Milner, Tom Ruffatto, John Grove, Montana Fish, Wildlife and Parks, Missoula, Kentucky Wolf Information Center, and USEPA, Region 8, Helena.

Certain issues became evident during the course of the analysis.

See project file (PF 2.1) for summary of preliminary issues raised during the scoping process and the disposition of these issues.

KEY ISSUES

Issues that the IDT believed to be key environmental issues and that were used to influence design considerations and mitigation for the proposed action and/or develop alternatives to the proposed action are presented below.

Access

The Canyon Creek Irrigation District (CCID) has requested helicopter access to their easements at the Canyon Lake Dam and Wyant Lake Dam on the Bitterroot National Forest. The CCID requires the access so they may rehabilitate the Canyon Lake Dam and so they may breach the Wyant Lake Dam.

Authorization of adequate access to CCID for the valid use of its easement is non-discretionary under the Wilderness Act and the Alaska National Interest Lands Conservation Act.

Some groups questioned whether helicopter access is consistent with management directions for wilderness. Other people supported helicopter use.

Wilderness Character

CCID has the right pursuant to its easement to utilize National Forest system lands for its dams and reservoirs, and the responsibility to maintain and operate the dams in accordance with the federal dam safety laws and regulations. The Forest Service has the responsibility and authority to regulate the use of that easement so as to protect the national forest.

Some groups wrote that: “where a choice must be made between wilderness values and any other activity, preserving the wilderness resource is the overriding value.”

DEVELOPMENT OF ALTERNATIVES

The interdisciplinary team reviewed comments received during scoping for the proposed action. Each comment was examined carefully by the IDT in an effort to better define the scope of analysis, the level of analysis that would be sufficient to address the concerns, and to develop a range of alternatives that is reasonable and responsive to the key issues. The alternatives that were developed are also responsive to CCID’s request to access their easements at Canyon Lake Dam and Wyant Lake Dam, so that they may make these facilities safe, consistent with their responsibilities under dam safety laws and regulations. Option D is new for the FEIS. It was proposed by CCID on February 13, 2003, after considering information from engineers, irrigation district and other publics.

Alternatives 2 and 3 each allow for CCID’s Options A, B, C and D. Alternatives 2 and 3, Options A, B, C were considered in the DEIS and are retained for consistency and disclosure. Reference Appendix A for detailed discussion of these options.

Option A, Repair Critical Deficiencies of Canyon Lake Dam.

Option B, Major Rehabilitation of Canyon Lake Dam.

Option C, Breach of Canyon Lake Dam.

Option D, Partial Breach of Canyon Lake Dam in 2003 (Phase I), Major Rehabilitation of Canyon Lake Dam in 2004 (Phase II).

All options include breaching Wyant Lake Dam.

ALTERNATIVES CONSIDERED IN DETAIL**ALTERNATIVE 1 – NO ACTION**

The No Action alternative is required by the National Environmental Protection Act (NEPA) and will serve as a baseline condition with which to compare other alternatives.

Under this alternative CCID would not be authorized access to repair their facilities. Similarly, no additional terms or conditions would be placed on their use of this easement. Routine maintenance would be allowed to continue under the existing easement.

This alternative would result in both Canyon and Wyant Lake Dams remaining in their present deteriorated condition. The condition of the dams would deteriorate to an unacceptable level. The dams would continue to be out of compliance with federal dam safety laws and regulations. The deficiencies for both dams are described in detail in Appendix A.

ALTERNATIVE 2 – PROPOSED ACTION

This alternative was developed to address the purpose and need for action.

This alternative was developed to authorize adequate access to Canyon Lake Dam and Wyant Lake Dam. It responds to CCID's plans to perform work at Canyon and Wyant Lake Dams, while limiting effects to wilderness and other resources.

The Bitterroot National Forest proposes to authorize the Canyon Creek Irrigation District access to their facilities. The Forest Service would authorize sufficient helicopter trips to allow for the work to be done at Canyon and Wyant Lake Dams (see the description of CCID's planned work in Appendix A).

In addition, in order to protect national forest values, the terms, conditions, and mitigation measures specified on pages 2-6 to 2-10 would be required during access and work periods authorized under this alternative.

Some minor maintenance could be done on Canyon Creek Trail #525 to accommodate minimal stock transport.

ALTERNATIVE 3 – PROPOSED ACTION WITH MODIFIED ACCESS

This alternative was developed to address the purpose and need for action and also address the issues of access and wilderness character.

Access would be modified as compared to Alternative 2. Helicopter transport would be authorized only for heavy equipment or materials too heavy or awkward to transport safely with stock. All other equipment, materials and supplies would be transported with stock. Most workers would hike or ride stock to the work site.

In 2003, trail work would be completed to accommodate stock access to Canyon and Wyant Dams. Canyon trail and trailhead would be reconstructed to safely accommodate this increased use. A new trail would be constructed from Canyon to Wyant Dam.

In late 2003, and in 2004 or 2005, the CCID would be authorized to use the fewest number of helicopter flights necessary to transport equipment and materials too heavy for stock. CCID would then be authorized to transport the remaining materials by stock on these trails(see the description of CCID's planned work in Appendix A). In addition, in order to protect National Forest values, the terms, conditions, and mitigation measures specified on pages 2-6 to 2-10 would be required during access and work periods authorized under this alternative.

MITIGATION MEASURES, TERMS AND CONDITIONS, MONITORING REQUIREMENTS AND PERMITS REQUIRED FOR ACTION ALTERNATIVES

Mitigation measures are those controls or guidelines that reduce or eliminate adverse effects of management activities. Monitoring is the gathering of information and observation of management activities to provide a basis for confirming that work is accomplished as designed and that mitigation measures are effective.

The original grant application to the State of Montana includes mitigation measures that were developed by the Canyon Creek Irrigation District's engineer. Most of these measures are incorporated into the following discussions.

In addition to Forest Service policy and Forest Plan requirements, the Interdisciplinary Team identified project-specific mitigation measures and other plans and specifications that would be required under each alternative. The Environmental Consequences of Alternatives discussion in Chapter 3 is based on implementation of the listed mitigation measures. Terms and conditions describe mitigation and monitoring items that will be required of CCID.

The terms and conditions and mitigation measures required for the action alternatives 2 and 3 are displayed on the following Tables 2.1 to 2.5.

The CCID options referred to in these tables are:

Option A, Repair Critical Deficiencies of Canyon Lake Dam,

Option B, Major Rehabilitation of Canyon Lake Dam,

Option C, Breach of Canyon Lake Dam,

Option D, Partial Breach of Canyon Lake Dam in 2003 (Phase I), Major Rehabilitation of Canyon Lake Dam in 2004 (Phase II).

All options include breaching Wyant Lake Dam.

The following items are CCID’s Responsibility:

Table 2.1 Terms and Conditions (CCID)

| Measure | Alt.2 CCID Options | Alt.3 CCID Options |
|--|--------------------------|--------------------------|
| Dam Safety | | |
| 1. A flood routing study will be completed on Canyon Dam to ensure that the partial breach or full breach (Options C & D), which will function as the principal spillway, will be sized to safely pass the required inflow design flood without overtopping the dam. The flood routing study for repairing Canyon Dam (Options A and B) would be required to size the existing Canyon Dam spillway to safely accommodate the required design flood. (The required inflow design flood for Canyon Dam is the Probable Maximum Flood because of the dam’s high hazard classification). A second flood routing study will also be required to ensure that Canyon Dam can safely route a Wyant Dam failure without overtopping Canyon Dam (All options). | A, B, C, D | A, B, C, D |
| 2. At the end of each field season, it is important that any corrective measures, including erosion control and armoring of the embankment, be completed to the extent that the dam can withstand the following winter conditions and spring runoff or precipitation events. Project work plans will include some room for contingencies because of the limited field season in which to accomplish the work. | A,B,C,D | A,B,C,D |
| 3. The dam owners are responsible to provide their own radio or telephone communications. | A, B, C, D | A, B, C, D |
| 4. During the construction period of the partial breach with minimal mechanized tools, CCID and their engineering representative will have an emergency plan in place to deal with flooding from a major storm event. Components of the plan will include the availability of onsite sand bags to armor the partially constructed breach, the backup availability of flying in heavy equipment, and establishing safety and emergency procedures to minimize risk to construction crew and downstream residents. | Phase 1 of D | Phase 1 of D |

| Measure | Alt.2 CCID Options | Alt.3 CCID Options |
|---|--------------------------|--------------------------|
| Wilderness Resource and Recreation | | |
| 5. Airlift flights in the valley will be routed to minimize noise near residences. Where feasible and safe to do so, helicopters will avoid flying over mountain goats. When possible helicopters will avoid flying directly over trails. | A, B, C, D | A, B, C, D |
| 6. Quiet low velocity blasting such as a boulder buster will be used as much as reasonable for rock excavation and quarrying. | A, B, C, D | A, B, C, D |
| 7. All solid wastes/refuse will be properly stored. | A, B, C, D | A, B, C, D |
| 8. All solid wastes will be removed from National Forest lands, except for burnable kitchen wastes. | A, B, C, D | A, B, C, D |
| 9. In Alternative 2 &3, Options A, B & C all human waste will be removed from National Forest lands. In Alternative 2 & 3, Option D, if mechanized transport is not needed for heavy equipment, latrines will be located 200' from water and filled in between and after Phases 1 & 2. If mechanized transport is needed for heavy equipment, all human waste will be removed form National Forest lands. | | |
| 10. Latrines will be used for human wastes and kitchen wastewater. | A, B, C, D | A, B, C, D |
| 11. All fuel shall be stored in an approved spill containment structure that shall be of sufficient capacity to contain all the fuel stored in the structure. The basic containment structure shall include an HDPE-lined basin and berm to contain spills or leaks. Fuel will be stored more than 100 feet from the surface water. All hazardous material will be removed from the site by the end of the operating season. A hazardous spill kit will be on site. | A, B, C, D | A, B, C, D |
| 12. Soil borrow areas, rock quarry for riprap, staging and stockpiling areas, fuel storage and containment area, and camping site for Canyon Lake Dam are shown on the "Canyon Lake Dam Site Plan" in Appendix D. | A, B, C, D | A, B, C, D |
| 13. Public notice of closures will be done by the CCID. | A, B, C, D | A, B, C, D |
| Water and Fisheries (if not specified, these apply to both dams) | | |
| 14. If possible, all work will be accomplished outside of the standing water. This is to be accomplished by the use of cofferdams around the work area on Canyon and Wyant dams. Pumps will be used to control seepage through cofferdams. Seepage will be pumped into the reservoir so sediments settle. | A, B, C, D | A, B, C, D |
| 15. Seepage and grout wash water will be pumped onto the reservoir shoreline to reduce suspended sediments. | A, B, C, D | A, B, C, D |
| 16. Water that flows into the reservoir during construction will be pumped over the dam and onto sites that can handle the water without eroding (consistent with mitigation #10 of irrigation district's loan application, May 2000). | A, B, C, D | A, B, C, D |
| 17. Weed free straw bales, silt fence or wattles, to capture sediment from construction operations shall be installed below disturbed areas. Three or more structures in succession may be required in cases where sediment is entering or will enter Canyon Creek. | A, B, C, D | A, B, C, D |
| 18. Disturbed areas, including soil borrow areas, as much as is practical, shall be confined to within the high water mark of the existing lake. Borrowed rock will be from the reservoir or from historical quarries near the high water mark. If suitable, these areas shall be rehabilitated, or re-contoured, at the end of the project. These areas shall be confined to the least amount of surface area. These areas shall have a Forest Service approved reclamation plan and be reclaimed to those specifications by the end of the project. | A, B, C, D | A, B, C, D |
| 19. In-channel sediment traps would be required below both dams during construction. At the Wyant breach site sediment traps could be located downstream in a location that is not dominated by boulders, but needs to be above the spawning area upstream of Canyon Lake. Forest fishery or hydrology personnel would help locate and design the traps. | A, B, C, D | A, B, C, D |

| Measure | Alt.2 CCID Options | Alt.3 CCID Options |
|--|-----------------------------------|-----------------------------------|
| 20. Breach options at Canyon Lake would include constructing a boulder cascade or a set of small falls and plunge pools (similar to Rosgen A2 channel type) to reduce velocity and energy between the breach and the wet meadow area below the dam. A Forest fisheries biologist and hydrologist will be notified when the stream reconstruction phase of the project would begin so they have the opportunity to be onsite if they determine it is necessary. | C, D | C, D |
| Heritage Resource | | |
| 21. A cultural site in the Canyon Lake reservoir soil borrow area will be avoided as a staging area, borrow site, or by compacting activities. | A, B, C, D | A, B, C, D |
| Revegetation and Reclamation | | |
| 22. Two historical borrow areas will be further reclaimed. Revegetation will be required on all construction-disturbed ground to forestall weedy invasion and to promote natural rehabilitation by local native plant sources. All revegetation activities will require the use of genetically local native plant material to the extent possible. These activities include construction sites associated with dam maintenance or repair, use of borrow areas, etc. (As directed by the Selway-Bitterroot Wilderness Vegetation Management- Forest Plan Amendment 12). | A, B, C, D | A, B, C, D |
| 23. All ground disturbing activities occurring outside the high water mark (such as at the campsite) will be reclaimed to a natural appearance using genetically local seed sources, if necessary | A, B, C, D | A, B, C, D |
| 24. CCID will submit a revegetation plan to the Forest Service for review, to ensure consistency with Wilderness values and direction provided for in the Selway-Bitterroot Wilderness Vegetation Management-Forest Plan Amendment 12). Goals for Revegetation are provided in Chapter 2. Revegetation recommendations can be found in the Revegetation Plan in the Project File | A, B, C, D | A, B, C, D |
| 25. All equipment used in repair or construction activities will be cleaned prior to use in the project area. All mud, dirt, and plant parts will be removed from all equipment before moving to the project area. Cleaning must occur off National Forest Lands. | A, B, C, D | A, B, C, D |
| 26. All borrow areas will be inspected prior to use or material transport. Sites occupied by noxious weed species will not be used. | A, B, C, D | A, B, C, D |
| 27. If straw bales or straw wattles are used in reclamation activities, they must be certified noxious weed free or noxious weed-seed free by the State of Montana. | A, B, C, D | A, B, C, D |

| Measure | Alt.2 CCID Options | Alt.3 CCID Options |
|---|--------------------------|--------------------------|
| Trail Reconstruction and Construction | | |
| 28. If the Canyon Trail is reconstructed, covering the previous trail tread with slash to obstruct access at either end of the trail will be done to discourage use. Water bars will be installed as necessary to prevent further erosion. | | A, B, C, D |
| 29. If a new trail is constructed to access Wyant Lake from Canyon Lake the amount of tread construction should be minimized in order to save as much native vegetation as possible. | | A, B, C, D |
| 30. Weed prevention practices for trail construction will be followed. (PF 2.2) | | A, B, C, D |
| 31. Any blasting (such as might be required for trail maintenance in Alternative 3, or rock crushing operations), will meet the requirements in the Programmatic Biological Assessment for Trail Maintenance (Western Montana Bull Trout Level I Team 1999 – PF 2.3) | A, B, C, D | A, B, C, D |
| 32. CCID would be responsible for contracting and cost of trail construction, reconstruction and maintenance as necessary for project work. | | A, B, C, D |
| Permits and Plans | | |
| 33. CCID will provide plans and specifications for the work to be done at the dams | A, B, C, D | A, B, C, D |
| 34. CCID would be responsible for obtaining the required state or federal permits. This would include: State of Montana, Department of Natural Resources 310 permit and Army Corps of Engineers 404 permit. A 318 authorization may be required from the Department of Environmental Quality | A, B, C, D | A, B, C, D |
| 35. Air Operations, Safety, Camp Management, Materials Handling and Spill Plan, Sediment Monitoring, Communications, Reclamation and Revegetation Plans will be required as a condition for the construction work and will be developed by CCID prior to construction and approved by the Forest Service. | A, B, C, D | A, B, C, D |
| 36. A contingency plan and response guide for spill emergencies, including onsite and during transport, shall be submitted and approved by the Forest Service prior to onsite fuel storage. | A, B, C, D | A, B, C, D |

The following items are Forest Service (FS) Responsibility:

Table 2.2 Mitigation Measures (FS)

| Measure | Alt. 2 CCID Options | Alt. 3 CCID Options |
|---|---------------------------|---------------------------|
| 37. A Forest Service wilderness ranger will discuss resource protection standards with workers. | A, B, C, D | A, B, C, D |
| 38. Wilderness visitor safety will be insured by temporary closures during work and helicopter operations. | A, B, C, D | A, B, C, D |
| 39. Where cultural resources or human remains are encountered during project implementation, the Forest has the authority to modify or halt project activities. | A, B, C, D | A, B, C, D |
| 40. Prehistoric site 24RA541, in the Canyon Lake Basin, will be evaluated to have its eligibility status formally determined during the summer of 2003. | A, B, C, D | A, B, C, D |
| 41. Forest Service Botanist will assist with seed collection and transplanting of vegetation. | A, B, C, D | A, B, C, D |
| 42. The Forest Service, prior to commencement of work, will approve all specifications and plans prepared by CCID. | A, B, C, D | A, B, C, D |
| 43. The Forest Service engineer is responsible to approve any work from a technical standpoint and assure that the work meets dam safety laws and regulations. | A, B, C, D | A, B, C, D |

ENVIRONMENTAL MONITORING

Monitoring and Inspection that is CCID's Responsibility:

CCID will provide a qualified engineer for site monitoring and quality control of work.

CCID will develop and implement a sediment monitoring plan and an erosion control plan, in conjunction with the terms and conditions on P. 2-8 and 2-9, and the 310 and 404 permits to ensure that environmental protection and mitigation measures are effective. This will include items such as checking sediment traps to see that they are functioning and to clean them out as needed.

Follow-up inspections of the dam after the first filling of water will be required in order to provide monitoring of the effectiveness of the repair work for safety and engineering standards.

Monitoring that is Forest Service Responsibility:

Monitoring specific to All Alternatives

A Forest Service engineer will periodically monitor the work performed at the dams. On-site routine monitoring by USFS engineering personnel will ensure engineering standards are being met. USFS engineer will monitor the rock borrow area to ensure these areas are confined to the least amount of surface area.

A Forest Service wilderness ranger will provide additional on-site monitoring during project work to ensure wilderness and resource protection standards are met at dam sites and within the access corridor. The wilderness ranger will provide feedback to ensure access and project work meet mitigation and protection standards.

Monitoring specific to Alternative 3

A Forest Service trails specialist will provide additional on-site monitoring during construction/reconstruction of trails to ensure wilderness and resource protection standards are met within the access corridor. The trails specialist will use specifications in all construction/reconstruction plans and mitigation measures to ensure work is meeting the mitigation and protection.

Annual follow-up inspections, for a period up to 5 years, of the trail will provide monitoring of the effectiveness of the trail repair work for safety and engineering standards, wilderness and recreation objectives, trail rehabilitation and drainage improvements.

ALTERNATIVES CONSIDERED BUT NOT GIVEN DETAILED STUDY

1. Mechanized transport would not be authorized. All equipment, materials, supplies and people would be transported with stock. The only motorized types of equipment that would be authorized would be those that can be transported with stock (compactors, generators, pumps).

In 2003, trail work would be completed to accommodate stock access to Canyon and Wyant Dams. Canyon trail and trailhead would be reconstructed. A new trail would be constructed from Canyon to Wyant Dam. In 2004, CCID would begin work to repair, rehabilitate or breach Canyon Lake Dam and to breach Wyant Lake Dam. Stock would be used to transport all equipment, materials, supplies and laborers. The CCID would use a combination of traditional tools and motorized equipment.

Three or four years would be required to complete all work on both of the dams. The dams would continue to deteriorate, and may not be operable during this period. Financial costs to the CCID in this alternative would likely be unreasonable and timing constraints may cause existing grants and conservation project loans to be unavailable. The risks of leaving work unfinished over multiple winters would be that the dams could be in a unsafe condition during the following spring runoff and snowmelt season. Due to the deteriorated condition of the dam, this alternative poses unacceptable risk to public safety and the environment.

Refer to 3, below, for additional information regarding multi-year implementation schedule for rehabilitation of Canyon Lake Dam.

2. No mechanized transport or motorized equipment would be authorized. All equipment, materials, supplies and people would be transported with stock.

In 2003, trail work would be completed to accommodate stock access to Canyon and Wyant Lake Dams. Canyon trail and trailhead would be reconstructed. A new trail would be constructed from Canyon to Wyant Lake Dam. In 2004, CCID would begin work to repair, rehabilitate or breach Canyon Lake Dam and to breach Wyant Lake Dam. It is estimated that more than 120 stock trips (each with 20 stock) would be used to transport all equipment, materials, supplies and laborers. The CCID would use traditional tools.

Six or seven years would be required to complete all work. The dams would continue to deteriorate, and may not be operable during this period. Financial costs to the CCID in this alternative would likely be unreasonable and timing constraints may cause existing grants and conservation project loans to be unavailable. The risks of leaving work unfinished over multiple winters would be that the dams could be in a unsafe condition during the following spring runoff and snowmelt season.

Due to the deteriorated condition of the dam, this alternative poses unacceptable risk to public safety and the environment.

Refer to 3, below, for additional information regarding multi-year implementation schedule for rehabilitation of Canyon Lake Dam.

3. Rehabilitation of Canyon Dam Using Multi-Year Implementation Schedule.

Consideration was given to conditioning the project to proceed over a number of years with minimal tools and non-mechanized means. Several factors influence the feasibility of this approach. Because the partial breach is limited in the scope and amount of time and effort necessary to complete this phase, an initial plan utilizing minimal tools was incorporated into the Final EIS. A backup plan utilizing mechanized equipment is also included because of the time constraints, which ultimately affects the safety of the dam. These time constraints are restrictive because the required work must be completed to a degree that leaves the dam in a safe condition. For example, at the end of each field season, it is important that any corrective measures, including erosion control and armoring of the embankment, be completed to the extent that the dam can withstand the following winter conditions and spring runoff or precipitation events.

The partial breach, because of its limited scope of work and amount of effort necessary to complete, may be feasible with the phased approach. However, a major reconstruction of the dam embankment, which will likely involve removing the rock shell if an impermeable liner is installed, would present critical timing and dam safety issues. Removing the rock in the proposed breach area versus removing the rock on the entire upstream embankment involves two significantly different magnitudes of work effort. Not only must the rock be temporarily removed, but also the bedding material, the liner, and then the protective cover must be installed over the liner to protect it - especially through the following winter and spring runoff conditions. This larger scope of work may present the Canyon Creek Irrigation District and their engineering representatives with liability issues that they would be unwilling to accept in regards to a long-term construction project lasting several years.

The major rehabilitation of the dam includes other factors that the dam owner should consider, such as: 1) contractor qualifications, past performance and ability to complete the work within the required timeframe, 2) costs and reasonableness of mobilizing equipment over a period of several years, rather than a single year, 3) utilization of construction methods which meet today's quality control requirements.

Quality of construction is also critical to dam safety. Deficiencies in materials or poor construction practices can affect the long-term performance of dam. Therefore, it is important to utilize construction methods that comply with today's dam safety standards and construction quality control requirements, such as materials processing (for filter rock), compaction, grouting and pipe welding standards.

4. Rehabilitating Wyant Lake Dam

The decision to rehabilitate Wyant Lake dam is not a Forest Service decision. CCID has not indicated desire to rehabilitate Wyant Lake dam.

5. Building a 5-foot wide trail bed to accommodate mechanized transport.

This alternative would have permanent impacts on the wilderness resource, would greatly increase the potential for motorized trespass in the wilderness, would add several months and add to the cost of the project.

COMPARISON OF THE EFFECTS OF THE ALTERNATIVES

The following tables and sections compare the effects of the alternatives by key issues, purpose and need, and other resources.

Key Issue: Access**Table 2.3: Access Comparison of Effects**

| Alternative 1 | Alternative 2 | Alternative 3 |
|--|--|--|
| No action does not meet need to access dams. | Access would be provided to the easement by helicopter. This would meet the need to access the dams. In Option D, Phase 1, some equipment could be packed in by stock and work crews would hike to Canyon Lake Dam | Access would be modified. Helicopter and stock access would be used. This could meet the need to access the dams but would extend the project duration and increase costs. |

Key Issue: Wilderness Character including Wilderness Resource and Legal Settings**Table 2.4: Wilderness Character Comparison of Effects**

| Alternative 1 | Alternative 2 | Alternative 3 |
|---|---|--|
| <p>In Alternative 1, there would be no work at either Canyon or Wyant Lakes and therefore no direct effect to the wilderness resource. An indirect effect of not making the dams safe (dam failure) would be irreparable harm to Canyon Creek's natural integrity through massive erosion of the stream channel and introduction of noxious weeds. Another indirect effect of repeated heavy maintenance requests to provide temporary fixes to dams safety problems would take place and there would be frequent requests to use mechanized transport or motorized equipment. If the dam failed as a result of not being made safe, worker and public safety would be compromised.</p> | <p>In Alternative 2, the work in Options A, B, or C would be accomplished during a one-year period and in Option D during a two-year period. Most work would occur in previously disturbed areas. Indirect effects would be minimal. The lake basin's problem area status would not be affected because existing campsites would be used and there would be no stock containment.</p> | <p>In Alternative 3, work would be accomplished during a two or three-year period. A new trail would be built between Canyon and Wyant Lake to accommodate stock transport. Indirect effects of a new trail to Wyant Lake would be loss of natural integrity (through introduction of noxious weeds) and increased campsite impacts (ease of access by both foot and stock users would add new campsites and degrade existing campsites). An indirect effect of reconstructing/constructing the trail system to accommodate stock use would be a reduction in requests to use helicopters for access. The lake basin's problem area status would be affected by increased use and impacts at existing campsites (work camps and stock containment) and new campsites at Wyant Lake (created because of easier access). Increased use in the Canyon drainage would at least temporarily relieve recreational pressure in nearby drainages that do not meet Forest Plan standards, but would not reduce overall problem status in those areas.</p> |

| Alternative 1 | Alternative 2 | Alternative 3 |
|-----------------------|---|---|
| | <p>In both action alternatives, the actual work, presence of workers and transportation of workers/equipment would affect visitor’s sense of remoteness and solitude through the duration of work. Sights and sounds of helicopter transport and mechanized equipment would be apparent on trails and throughout the lake basin. These sights and sounds would be intrusions on visitor’s sense of remoteness and solitude. Effects to apparent naturalness would be greater with reconstruction at Canyon Dam in Options A, B and D than with a breach, Option C. New areas would be used for fill material sources and there would be visible additions to the dam’s structure (trash racks, rock work, additional spillway capacity, etc.). In both action alternatives, a breach would improve the natural integrity of the Canyon Creek stream channel. A breach would also indirectly benefit visitor solitude. Since there would be no vegetation to screen campers near the original shoreline, use would probably continue at existing campsites. This would maintain use about 200’ from water and reduce social encounters around the lakes. Work needed to make both dams safe would indirectly benefit the wilderness legal setting by reducing or eliminating (depending on reconstruction or breach) the number of requests in the future for heavy maintenance to provide for temporary fixes to dam safety problems and associated requests to use mechanized transport or motorized equipment. Worker safety would be improved if maintenance needs are reduced and greatly improved if maintenance needs are eliminated.</p> | |
| No Cumulative Effects | <p>In both action alternatives, use of mechanized transport and motorized equipment authorized on this and other wilderness dams would have a cumulative effect on the wilderness resource.</p> | |
| | | <p>Alternative 3 would have additional cumulative effects to the wilderness resource. Increased foot and stock use would degrade the Canyon/Wyant lake problem area status, requiring management action that might result in restrictions to visitor use.</p> |

Purpose and Need: Dam Safety

Table 2.5 Dam Safety Comparison of Effects

| Alternative 1 | Alternative 2 | Alternative 3 |
|---|---|--|
| No action, does not meet dam safety requirements. | This alternative meets dam safety requirements. | This alternative meets dam safety requirements, with conditions on the timeliness of the trail construction. |

Other Effects by Resource

Table 2.6 – Comparison of Effects on Trails and General Recreation

| Alternative 1 | Alternative 2 | Alternative 3 |
|--|--|--|
| <p>In Alternative 1, there would be no work at either Canyon or Wyant Dams and therefore no additional use at the parking area or on the trail. There would be no area closures. The indirect effect of not making the dams safe (dam failure) would be damage to Canyon Trail #525 at numerous locations along the creek. Trail damage would temporarily limit visitor access and be costly to repair.</p> | <p>There would be no direct or indirect effects to Canyon Trail #525 since primary access for workers and equipment would be by helicopter.</p> <p>Work would affect visitor experience during a one-year field construction period for Option A, B or C. Work would affect visitor experience during a two-year field construction period for Option D (see Effects Common to Action Alternatives).</p> | <p>In Alternative 3, reconstruction of Canyon Trail #525, construction of a new trail to Wyant Lake and improvement of the trailhead to accommodate stock transport would occur. There would be no restrictions on the trail during approximately 20 days of stock transport but visitors would be inconvenienced (at the parking area and by encounters with stock along the trail). An indirect effect of improving the trail and parking area to accommodate stock use and of building a trail between Canyon and Wyant Lakes would be ease of access for both foot and stock users. Increased stock use would require increased trail maintenance.</p> <p>Work would affect visitor experience during a two-year field construction period or longer for Option A, B or C. Work would affect visitor experience during a two or three year field construction period for Option D (see Effects Common to Action Alternatives).</p> |
| <p>In both action alternatives, recreational restrictions in the vicinity of work at Canyon and Wyant Lakes would depend on the location/timing of work and on safety considerations. The need for area closures during work would affect visitor access at Canyon and Wyant Dams during the entire work project and on the trail when helicopters were used for transport. Areas not directly involved in work projects would remain open to use. In both action alternatives, a breach at Canyon Lake (Option C) would reduce lake capacity and leave the existing shoreline exposed and degrade visitor experience. This effect would gradually diminish (over approximately 20 years) as vegetation/trees naturalize the area between the existing and original shorelines. Recreational fishing opportunities would be affected by the smaller lake capacity and its reduced ability to support fish over the winter.</p> | | |
| <p>It is unlikely that any of the alternatives would have cumulative effects on either the Canyon Trail #525 or general recreation.</p> | | |

Heritage Resources

Table 2.7 Heritage Resources Comparison of Effects

| Alternative 1 | Alternative 2 | Alternative 3 |
|------------------|---|--|
| <p>No effect</p> | <p>Canyon Lake Dam is Not Eligible for the National Register, therefore, repairs, maintenance or reconstruction to the dam itself will have no effect on cultural resource values.</p> <p>A prehistoric site 24RA541 will not be affected by the proposed action, provided that all project-associated activities such as</p> | <p>Canyon Lake Dam is Not Eligible for the National Register, therefore, repairs, maintenance or reconstruction to the dam itself will have no effect on cultural resource values.</p> <p>A prehistoric site 24RA541 will not be affected by the proposed action, provided that all project-associated activities such as stock confinement or</p> |

| Alternative 1 | Alternative 2 | Alternative 3 |
|---------------|--|--|
| | stock confinement or grazing, camping and latrine areas, borrow sites, etc. avoid the 24RA541 location. | grazing, camping and latrine areas, borrow sites, etc. avoid the 24RA541 location. |
| No effect | The Montana State Historic Preservation Officer determined Wyant Lake Dam (24RA0549) Eligible for the National Register of Historic Places on February 3, 2003. On the same date, Montana SHPO concurred that the proposed breaching via deepening of the existing spillway (previously enlarged in 1971) and the opening of the outlet gate would constitute No Adverse Effect to the Wyant Dam historic property.. Although the dam itself was resurveyed on August 7, 2001, the area (basin) surrounding Wyant Lake has not yet received a cultural resource inventory. | The Montana State Historic Preservation Officer determined Wyant Lake Dam (24RA0549) Eligible for the National Register of Historic Places on February 3, 2003. On the same date, Montana SHPO concurred that the proposed breaching via deepening of the existing spillway (previously enlarged in 1971) and the opening of the outlet gate would constitute No Adverse Effect to the Wyant Dam historic property.. Although the dam itself was resurveyed on August 7, 2001, the area (basin) surrounding Wyant Lake has not yet received a cultural resource inventory. |

Economics

The following Table 3.1, displays estimated selected costs to CCID to implement the alternatives. These costs are only relative values, and may be used only to compare alternatives. These costs for dam rehabilitation and breach are estimated at \pm \$150,000. Costs are listed per option and alternative. Revegetation costs would be included in the costs of the rehabilitation or breaching the dams.

Table 2.8 Estimated costs to CCID for Alternatives

| Alternative | Option | Cost for Work Related to Dams and Trail Work | Comments |
|----------------|---|---|--|
| Alternative 1 | | No direct costs identified for No Action Alternative. | Catastrophic failure would result in resource and human damages. |
| Alternative 2 | Option A Canyon Lake Dam repair and breach Wyant Lake Dam | \$538,000 | Project cost for work at Canyon Lake Dam is offset additionally by grant and loan funding. |
| | Option B Canyon Lake Dam rehabilitation and breach Wyant Lake Dam | \$1,100,000 | |
| | Option C Breach Canyon Lake Dam and breach Wyant Lake Dam | \$301,000 | No grant or loan funding would be available. |
| | Option D Partial Breach of Canyon Lake Dam in 2003, Major Rehabilitation of Canyon Lake Dam in 2004 | \$880,000 to \$1,200,000 | Project cost for work at Canyon Lake Dam is offset additionally by grant and loan funding |
| Alternative 3- | Option A Canyon Lake Dam repair and breach Wyant Lake Dam | \$638,000 | Project cost for work at Canyon Lake Dam is offset additionally by grant and loan |

| Alternative | Option | Cost for Work Related to Dams and Trail Work | Comments |
|-------------|---|--|---|
| | Option B Canyon Lake Dam rehabilitation and breach Wyant Lake Dam | \$1,200,000 | funding. Estimated costs for trail construction and reconstruction work of \$100,000 is added to costs to rehabilitate and breach dams. The cost for trail work would not be covered by grant funding). |
| | Option C Breach Canyon Lake Dam and breach Wyant Lake Dam | \$401,000 | Estimated costs for trail construction and reconstruction work is added to costs to rehabilitate and breach dams. No grant or loan funding would be available. |
| | Option D Partial Breach of Canyon Lake Dam in 2003, Major Rehabilitation of Canyon Lake Dam in 2004 | \$980, 000 to \$1,300,00) | Project cost for work at Canyon Lake Dam is offset additionally by grant and loan funding |

Estimated Costs to Forest Service

Alternative 1

Routine engineering dam monitoring and inspection costs could increase by \$750 annually.

Alternative 2

Cost to the Forest Service of monitoring dam project work at Canyon and Wyant Lake Dams is estimated at \$8,400 for Options A, B, C and \$13,450 for Option D.

Alternative 3

In addition to the monitoring costs in Alternative 2, costs of monitoring trail project work is estimated at \$4,000. Total cost to the Forest Service for monitoring would be estimated at \$12,400 for Options A, B, C and \$17,450 for Option D

Table 2.9 Comparison of Effects on Wildlife

| Wildlife Resource | Alternative 1 | Alternative 2 | Alternative 3 |
|--|---------------|--|---|
| Management Indicator Species (MIS) - Elk | No Effect | No Effect to elk habitat. Minor disturbance to elk from construction and helicopter flights. | No Effect to elk habitat. Minor disturbance to elk from construction, helicopter flights and people traveling on trail. Trail improvement and construction has potential to cause longer lasting more severe disturbance to elk in the area. The proposed trail improvement and construction would likely lead to increased recreational use of the trail and the |

| Wildlife Resource | Alternative 1 | Alternative 2 | Alternative 3 |
|---------------------------|---------------|--|---|
| | | | <p>areas around Canyon and Wyant Lakes. This increased use could result in minor additional disturbance effects to elk in the future.</p> |
| MIS- Pine Marten | No effect | No effect on marten habitat. No lasting adverse effects to marten. | <p>No effect on marten habitat. Trail improvement and construction has the potential to cause some disturbance to marten in the area. The proposed trail improvement and construction would likely lead to increased recreational use of the trail and the areas around Canyon and Wyant Lakes. This increased use could result in minor additional disturbance effects to marten in the future.</p> |
| MIS – Pileated Woodpecker | No effect | <p>No effect on pileated woodpecker habitat. No effect from construction activities. Helicopter flights could disturb pileated woodpeckers to a minor degree. No lasting adverse effects from workers on trail.</p> | <p>No effect on pileated woodpecker habitat. No effect from construction activities. Helicopter flights could disturb pileated woodpeckers to a minor degree. No lasting adverse effects from workers on trail. Trail improvement and construction has the potential to cause some disturbance to pileated woodpeckers in the area. The proposed trail improvement and construction would likely lead to increased recreational use of the trail and the areas around Canyon and Wyant Lakes. Increased use of the trail to Canyon Lake could result in minor additional disturbance effects to pileated woodpeckers in the future. Increased recreational use around the lakes would not affect this species because there is no suitable habitat in the immediate area.</p> |
| Threatened status-Lynx | No effect | <p>No effect on lynx habitat. Helicopter flights could disturb lynx to a minor degree. Construction activities could disturb individual lynx, but would not effect lynx populations. The project is not likely to jeopardize the</p> | <p>No effect on lynx habitat. Helicopter flights could disturb lynx to a minor degree. Construction activities could disturb individual lynx, but would not effect lynx populations. Trail improvement and construction has the potential to</p> |

| Wildlife Resource | Alternative 1 | Alternative 2 | Alternative 3 |
|--------------------------------------|---------------|---|---|
| | | continued existence of the Canada lynx. No critical habitat has been designated for this species, therefore, none will be affected. Effects stemming from implementation of the proposed action are likely insignificant or discountable. | cause some disturbance to Lynx if in the area. The project is not likely to jeopardize the continued existence of the Canada lynx. No critical habitat has been designated for this species, therefore, none will be affected. Effects stemming from implementation of the proposed action are likely insignificant or discountable. The proposed trail improvement and construction would likely lead to increased recreational use of the trail and the areas around Canyon and Wyant Lakes. This increased use could result in minor additional disturbance effects to lynx in the future. |
| Threatened status – Bald Eagle | No effect | No effect | No effect |
| Endangered Status- Gray Wolf | No effect | No effect on wolf habitat. Chance of disturbance from construction activities and/or helicopter flights. | No effect on wolf habitat. Chance of disturbance from construction activities and/or helicopter flights. Trail improvement and construction has the potential to cause some disturbance to wolves if in the area. The proposed trail improvement and construction would likely lead to increased recreational use of the trail and the areas around Canyon and Wyant Lakes. This increased use could result in minor additional disturbance effects to wolves in the future. |
| Threatened status – Grizzly Bear | No effect | No effect on grizzly bear habitat or population. | No effect on grizzly bear habitat or population. |
| Sensitive Species – Peregrine Falcon | No effect | No effect on peregrine habitat. Explosives could disturb nesting peregrine, but this is unlikely due to late season construction period and no known eyries. | No effect on peregrine habitat. Explosives could disturb nesting peregrine, but this is unlikely due to late season construction period and no known eyries. Increased recreational use caused by trail improvement and construction would be inconsequential to peregrine falcons. |
| Sensitive Species – Flammulated owl | No effect | No or little effect | Minor effect to habitat if trail improvements required felling of potential owl nest snags. The |

| Wildlife Resource | Alternative 1 | Alternative 2 | Alternative 3 |
|--|------------------|--|--|
| | | | <p>proposed trail improvement and construction would likely lead to increased recreational use of the trail and the areas around Canyon and Wyant Lakes. Increased use of the trail to Canyon Lake could result in minor additional disturbance effects to flammulated owls in the future. Increased recreational use around the lakes would not affect this species because there is no suitable habitat in the immediate area.</p> |
| <p>Sensitive Species – Black-backed woodpecker</p> | <p>No effect</p> | <p>No or little effect</p> | <p>No or little effect during construction activities. The proposed trail improvement and construction would likely lead to increased recreational use of the trail and the areas around Canyon and Wyant Lakes. This increased use could result in minor additional disturbance effects to black-backed woodpeckers in the future.</p> |
| <p>Sensitive Species- Fisher</p> | <p>No effect</p> | <p>No or little effect</p> | <p>Trail improvement and construction has the potential to cause some disturbance to fisher in the area. The proposed trail improvement and construction would likely lead to increased recreational use of the trail and the areas around Canyon and Wyant Lakes. This increased use could result in minor additional disturbance effects to fisher in the future.</p> |
| <p>Sensitive Species- Wolverine</p> | <p>No effect</p> | <p>No effect to wolverine habitat. Small chance of disturbance from construction activities.</p> | <p>No effect to wolverine habitat. Small chance of disturbance from construction activities. Trail improvement and construction has the potential to cause some disturbance to wolverines in the area. The proposed trail improvement and construction would likely lead to increased recreational use of the trail and the areas around Canyon and Wyant Lakes. This increased use could result in minor additional disturbance effects to wolverine in the future.</p> |

| Wildlife Resource | Alternative 1 | Alternative 2 | Alternative 3 |
|--|---------------|--|--|
| Sensitive Species- Coeur d'Alene salamander | No effect | Could affect habitat during construction. No lasting adverse effects. | Could affect habitat during construction. No lasting adverse effects. |
| Sensitive Species - Goshawk | No effects | No effect to habitat. No or minor effects from hikers on trail. | No effect to habitat. Could potentially cause disturbance to goshawk resulting in abandoned nest if trail work in the lower few miles of trail, were concentrated near a nest in April, May or June. The proposed trail improvement and construction would likely lead to increased recreational use of the trail and the areas around Canyon and Wyant Lakes. Increased use of the trail to Canyon Lake could result in minor additional disturbance effects to goshawks in the future. Increased recreational use around the lakes would not affect this species because there is no suitable habitat in the immediate area. |
| Sensitive Species – Boreal (or Western) Toad | No effect | Could effect boreal toad habitat with minor temporary changes to water flows. Limited potential to affect individual toads. | Similar to 2, but trail reconstruction activities have some potential to have a minor effect on individual toads. The proposed trail improvement and construction would likely lead to increased recreational use of the trail and the areas around Canyon and Wyant Lakes. This increased use could result in minor additional disturbance effects to toads in the future. |
| Other wildlife species – Mountain Goat | No effect | No effect to goat habitat. Helicopter flights could potentially cause severe disturbance to goats, if the helicopter passed low over the goats. Minor disturbance to goats could occur as a result of construction activities. | Similar to 2, but trail reconstruction activities have some potential to cause longer lasting, more severe disturbance to goats. Goats most likely would respond by moving away from the disturbance. No long lasting adverse effects to goats. The proposed trail improvement and construction would likely lead to increased recreational use of the trail and the areas around Canyon and Wyant Lakes. This increased use could result in minor additional disturbance effects to goats in the future. |

| Wildlife Resource | Alternative 1 | Alternative 2 | Alternative 3 |
|-------------------|---------------|---------------|---------------|
| | | | |

Table 2.10 Comparison of Effects on Fish and Water

| Fisheries and Water Resources | Alternative 1 | Alternative 2 | Alternative 3 |
|---------------------------------|---|--|---|
| Fish Habitat | Potential to severely degrade habitat | Short term and negligible changes in fish habitat | |
| Fish Individuals or Populations | Potential to kill fish and other aquatic animals. Recovery time would be more than a decade | Short term and negligible changes in fish populations | Short term and negligible changes in fish populations Blasting for trail work may impact fish within the shock zone. |
| Sediment: Canyon Lake Dam | Potential dams failure would likely result in high flows, a large sediment release and extensive scouring throughout the canyon. | Small potential to produce short-term sediment, due to mitigation measures, project design, and natural sediment trapping ability of the reservoir. Only the areas adjacent to the dam outlet could produce sediment in Canyon Creek, and these contributions would be minimized through the erosion control plan. Options C & D may cause channel adjustment in the small wet meadow below the breach, and contribute a limited amount of sediment to downstream reaches. No long-term effects predicted. | |
| Sediment: Wyant Lake Dam | Potential dams failure would likely result in high flows, a large sediment release and extensive scouring throughout the canyon. | Sediment leaving the reservoir will likely be quite limited, due to mitigation measures and project design. Canyon Reservoir would retain any sediment passing the proposed in-stream sediment traps to limit effects to the reach of stream between the two reservoirs. The reach of stream between the two reservoirs is most likely to be affected by sediment from Wyant Reservoir. Canyon Lake's non-native trout use this section of stream for spawning. The fine sediments exposed by the lowering of the water level have the potential to create and support high-quality alpine wetlands, similar to those created in beaver pond complexes when those areas are abandoned. Channel adjustment in the former reservoir bed has the potential to last two to three flow seasons, until the new stream banks have adjusted and vegetated. No long-term effects predicted. | |
| Riparian and Wetland Areas | Potential dams failure would likely result in high flows, a possible flash flood and extensive scouring throughout the canyon. Streamside riparian areas could be severely damaged or eroded away completely. | Riparian areas are very limited around the proposed construction sites. Riparian impacts would be extremely limited by mitigation measures and project design. Options C & D may cause channel adjustment in the small wet meadow below the breach, reducing the size of this riparian area by a small amount. All options are likely to increase stable wetlands in the former Wyant reservoir bed. No net loss of riparian or wetland area predicted. | |
| Water Effects from Excavation | No effect. | No negative environmental effects are expected from the spreading of excavated rock on the reservoir floor. Excavation seepage and grouting washwater would be pumped and discharged at the reservoir shoreline for settling or | No negative environmental effects are expected from the spreading of excavated rock on the reservoir floor. Excavation seepage and grouting washwater would be pumped and discharged at the reservoir shoreline for settling or filtration of sediment. |

| Fisheries and Water Resources | Alternative 1 | Alternative 2 | Alternative 3 |
|-------------------------------|---------------|--|---|
| | | filtration of sediment. Reservoir outflow would be diverted away from the excavation site and pumped over the dam crest or spillway. | Reservoir outflow would be diverted away from the excavation site and pumped over the dam crest or spillway. |
| Water Effects from Trail work | No effect | Little to no impact is expected from the trail maintenance work. | Very little impact is expected from the construction or reconstruction of this foot/stock trail. A very small amount of sediment may be contributed to water bodies or wetlands through the points where the trail crosses or runs immediately adjacent to the stream or its tributaries. No long-term effects predicted. |

Table 2.11 Canyon Lake Dam**Comparison of Effects on Sensitive Plants**

| Species | Alternative 1 | Alternative 2 | Alternative 3 |
|--|---------------|---------------|---------------|
| Bitterroot bladderpod (<i>Lesquerella humilis</i>) | NI | MIH | MIH |
| Storm saxifrage (<i>Saxifraga temestiva</i>) | NI | MIH | MIH |
| Western boneset (<i>Eupatorium occidentale</i>) | NI | MIH | MIH |
| Rough fleabane (<i>Erigeron asperugineus</i>) | NI | MIH | MIH |
| Idaho douglasia (<i>Douglasia idahoensis</i>) | NI | MIH | MIH |
| Candystick (<i>Allotropa virgata</i>) | NI | NI | NI |
| Sandweed (<i>Athysanus pusillus</i>) | NI | NI | NI |
| Scalepod (<i>Idaho scapigera</i>) | NI | NI | NI |

Table 2.12 Wyant Lake Dam**Comparison of Effects on Sensitive Plants**

| Species | Alternative 1 | Alternative 2 | Alternative 3 |
|--|---------------|---------------|---------------|
| Bitterroot bladderpod (<i>Lesquerella humilis</i>) | NI | MIH | MIH |
| Storm saxifrage (<i>Saxifraga temestiva</i>) | NI | MIH | MIH |
| Western boneset (<i>Eupatorium occidentale</i>) | NI | MIH | MIH |
| Rough fleabane (<i>Erigeron asperugineus</i>) | NI | MIH | MIH |
| Idaho douglasia (<i>Douglasia idahoensis</i>) | NI | MIH | MIH |
| Candystick (<i>Allotropa virgata</i>) | NI | NI | NI |
| Sandweed (<i>Athysanus pusillus</i>) | NI | NI | MIH |
| Scalepod (<i>Idaho scapigera</i>) | NI | NI | MIH |

NI = No Impact

MIH = May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing Or Loss of Viability To The Population Or Species.

WIFV*= Will Impact Individuals Or Habitat With A Consequence That The Action May Contribute To A Trend Towards Federal Listing Or Cause A Loss Of Viability To The Population Or Species (*trigger for significant action)

BI= Beneficial Impact

CHAPTER 3

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter discusses the existing conditions of the resources, the anticipated effects of each of the alternatives and consistency with Forest Plan and other direction.

For each resource addressed in this chapter, past, present and reasonably foreseeable future activities were analyzed along with proposed activities to determine effects of access and the work on the dams.

Generally, the affected area for this proposed project is within the Canyon Creek drainage. However, the analysis area for this project may vary by resource, and changes to the analysis area will be noted in the resource discussion.

HUMAN AND WILDERNESS ENVIRONMENT

DAMS AND DAM SAFETY

Existing Condition/Affected Environment

General Description

Location and Access

Canyon Lake Dam and Wyant Lake Dam are located just inside the boundary of the Selway-Bitterroot Wilderness. Canyon Creek Trail begins at the mouth of Canyon Creek and accesses both dams. The trail is approximately 5 miles to the first dam, Canyon Dam. Within the last mile east of Canyon Dam, the trail crosses a steep, rocky slope. This section of trail presents unsafe travel conditions for stock use. The access from Canyon Lake Dam to Wyant Lake Dam follows the north shore of Canyon Lake on user created trails, then traverses a steep rock face. This section is less than one mile and also presents a significant hazard to stock use.

Canyon Lake Dam

Canyon Lake Dam was originally constructed at the outlet of a natural cirque lake. The lake elevation is approximately 7,300 feet. The foundation of the dam is bedrock “which consists primarily of granite, granitic gneiss, and gneissic quartz monzonite. The hard massive foundation bedrock has a few random joints/seams” (Dam Safety Inspection Report Canyon Lake Dam, David Jones, P.E., January 27, 2000, PF 3.2).

Canyon Lake Dam is a rock fill dam with a soil core. Crest repairs after an overtopping event in 1996 confirmed that a soft soil cement core wall (18 to 24 inches wide) exists approximately 5 feet below the dam crest. According to the Dam Safety Inspection Report, prepared by David

Jones, Jan 2000, PF 3.2): “Each side of the soil cement wall has a 2 foot wide zone of a silt-sand soil. From the limited exposure, the outside slopes of the soil zones appear near vertical. The soil zones are covered with rock shells. The upstream slope rock varies in size up to 18 inches in diameter. The downstream slope rock is generally in large sizes up to 5 feet in diameter. There are no transition zones between the soil and the large voids at the shell rock/soil interface.”

In a recent geotechnical investigation of Canyon Dam conducted in September 2002, (“Canyon Lake Dam Improvements Project, Geotechnical Investigation,” Hydrometrics, Inc., Oct. 2002, PF 3.3), data was gathered to evaluate potential seepage and instability problems within the existing embankment. The geotechnical investigation included the completion of five exploratory holes using a 6-inch hollow stem auger. Standard penetration tests (SPT) were conducted during the drilling operations. The Hydrometrics report characterizes the existing dam embankment as follows:

“The laboratory testing indicates that the embankment core is made up of fine, silty sand. The upper 6 feet of the embankment has a silt content of about 30%. In the center section of the dam there is lime or cement mixed with this silty sand below 4 feet, raising its fine content to about 40%. Below 6 feet, the silty sand contains significantly more small gravel for a foot or two, and below 8 feet the silty sand is nearly 50% fines. In all bore holes, large rock was encountered at a depth of about 12 feet, and wood was encountered in one, suggesting that a large rock crib forms the bottom portion of the dam core. The extremely high water content (70% - 90%) of the soil just above the rock crib suggests that the fine silty soil may have been hydraulically washed into the voids of the rock crib.”

The feasibility study, completed earlier by David Jones, DJ Engineering (May 2000, PF 3.4), addressed the more immediate dam safety concerns, which includes an inadequate spillway capacity, an uneven dam crest and a failing outlet works at Canyon Dam. A slide gate located on the upstream side of the dam controls irrigation releases. A log catwalk provides access to the gate operator. The outlet works is a 55-foot long masonry conduit, and the deteriorated condition of this conduit has been described in Appendix A. The spillway, located at the left abutment, was excavated in a rock channel that discharges safely away from the toe of the embankment. A logboom spans across the entrance to the spillway channel. Based on a hydrologic study (Canyon and Wyant Lakes Hydrologic Evaluation, Joe VanMullen, P.E., April 3, 2000, PF 3.1), the capacity of the spillway was determined to be inadequate to pass the Probable Maximum Flood (PMF) without overtopping the dam. The inadequacy of the spillway has been confirmed by past overtopping events. The existing condition and deficiencies affecting the safety of Canyon Dam are described in more detail in Appendix A.

The deteriorated condition of Canyon Dam is the driving force behind the work proposed by Canyon Creek Irrigation District. Options A, B, C and D were developed to address both immediate repair and long-term reconstruction needs by engineering representatives for the Canyon Creek Irrigation District.

Wyant Lake Dam

Wyant Lake Dam was also originally constructed at the outlet of a natural cirque lake. The dam is an earth embankment dam constructed in two sections. The main embankment near the right abutment was constructed from rock placed by hand, stacked and mortared almost vertically from the streambed to the crest. Downstream of the mortared wall is a berm of hand-placed rubble rock while the upstream portion is rock filled timber cribs. The left side of the dam, or “saddle dam section”, was constructed between the left abutment of the main embankment and a rock outcropping on the right side of the spillway. This is the primary section of concern because of the rotting timber cribs and sloughing embankment towards the reservoir.

A slide gate, located on the upstream side of the dam controls flows through the 60-foot long, rectangular rock masonry conduit. Interior photos of the conduit indicate that it “appears to be in surprisingly good condition considering nearly 100 years of service. The only evidence of roof distress was a fractured and slight slump of a roof slab rock” (Dam Safety Inspection Report, Wyant Lake Dam, David Jones, P.E., Jan. 2000, PF 3.5).

Dam Safety Concerns

Refer to Appendix A for a detailed description of the condition of Canyon and Wyant Lake dams and Canyon Creek Irrigation District’s proposed work to be performed.

Regulatory Framework

Refer to Appendix C for a discussion of authorities to regulate dams on National Forest System Lands.

Environmental Consequences

Alternative 1 -No Action

Direct and Indirect Effects

This alternative would not meet the Purpose and Need for Action, because no access would occur to Canyon and Wyant Lake dams in order to allow the dams to be improved to a condition that would meet the required safety standards.

If the No Action Alternative is pursued and Canyon Lake Dam is not rehabilitated, the outlet works conduit would continue to deteriorate and potentially block any flow through the outlet works. The existing spillway is currently undersized and there is not adequate freeboard to protect the dam embankment from wave action and an overtopping event.

Not only could the dam fail because of high runoff conditions leading to an overtopping event, but also from the progressive collapse of the masonry roof structure in the outlet conduit, which supports the overlying material in the embankment. The movement of this material into the conduit could induce piping of material through the outlet works, and, eventually result in loss of

integrity and failure of the structure. This type of failure is insidious because it could occur when it is least expected - under clear and sunny skies, or “clear weather breach” conditions.

The deterioration on Wyant Lake Dam is also progressively getting worse. If the No Action Alternative is pursued, and Wyant Lake Dam is not breached, the likely consequences will be an uncontrolled failure of the embankment and a failure of the dam.

Dam failure at either Canyon or Wyant Lake Dams could result in loss of life and damage to the environment, based on the results of a breach analysis for Canyon Lake Dam (PF 3.6). A failure at Wyant Lake Dam could also overtop and potentially fail Canyon Lake Dam (See Appendix A for more details). The inundation area includes a section of the West Side Road and a residence located next to the West Side Road where it crosses Canyon Creek. The results of the breach analysis indicates that the West Side Road would be overtopped approximately 3 feet, which would then potentially fail the fill slope of the road.

Alternative 2 - Proposed Action

The proposed action, Alternative 2, was developed after numerous meetings with the Canyon Creek Irrigation District, CCID engineers and Forest Service ID Team specialists. Careful consideration was given to methods acceptable to wilderness values in the Minimum Requirements Decision Process (PF 1.2). It is critical that sound, practical engineering principles are used in the final design and implementation of the project. Difficult constraints, including remote access, limited construction season, and protection of downstream water quality, may result in less efficient and unconventional alternatives to implement the project.

The work proposed to be done at the dams is required in order to meet federal dam safety laws and regulations.

Option A and B

The primary objective of the proposed action is to comply with federal dam safety requirements and to prevent sudden failure resulting in loss of life or extensive damage to property or the environment. The area of direct effects of the proposed action will be contained within the existing easement for both dams, which is within 50 feet of the high water mark.

Option A, includes the less intrusive method to rehabilitate the outlet works for Canyon Lake Dam, which is to bore a new outlet conduit. If fractured rock is found, and boring is not possible, Option B will occur. The boring of a new outlet works, or Option A, presents some uncertainty as a feasible option because of unknown foundation characteristics.

In Option B, for Canyon Lake Dam rehabilitation (proposed work is described in Appendix A) the embankment would be excavated down to the existing outlet works in a cut and cover action. This is the more invasive option to the dam embankment because of the amount of material that would need to be temporarily moved and stockpiled according to function, such as embankment material and riprap. Potential sediment deposits will be used to reclaim historical borrow areas. The majority of this material would be placed back into the rehabilitated structure in engineered

lifts or placed back onto the embankment to provide riprap protection. However, this alternative presents the less impactful environmental consequences - when compared to the No Action Alternative and sudden dam failure potentially resulting in loss of life and scouring and debris flows in the downstream channel.

There will be additional borrow material required to increase the embankment height to meet the required spillway capacity. These details are discussed in Appendix A. The borrow material will come from the west side of the lake below the high water mark. After the project is completed, this area will be reclaimed to natural contours. Excavation work affecting the embankment will be accomplished after the water level of the reservoir has been drawn down.

Both Options A and B would include modifications to increase the Canyon Dam spillway capacity to route the Probable Maximum Flood, or PMF. This work may include the addition of an auxiliary spillway to accommodate this design flood. The Canyon Dam spillway would also be sized to route a Wyant Dam failure.

Helicopter access would allow for timely completion of project work. Timeliness is essential – not only from a dam safety perspective because of the deteriorated condition of the dams, but also from a resource protection perspective. All repairs should be planned for completion in one operating season, typically within a 90-day window between mid-July and mid-October. It is essential that all equipment shall be of sufficient capacity to reasonably accomplish all tasks in one operating season and allow some room for contingencies. Unnecessary risk of failure and severe damage to natural resources would result if repairs are not completed during the field season, particularly during the potential cut and cover repair work. Risks of resource damage are increased during the winter and subsequent snowmelt and spring runoff if repairs are left in an “open”, or exposed embankment condition without any armoring.

If the process is delayed, then the risks are great. A failure at either dam could be catastrophic to both interests – loss of life and property facing the shareholders of the Canyon Creek Irrigation District, and the scour and release of sediment into the downstream channel impacting other resources.

Option C

Alternative 2, Option C which considers the breach of Canyon Dam essentially presents the same environmental consequences as the first stage of a cut and cover operation. The initial stage of a cut and cover or a dam breach is to excavate down to the level of the natural ground at the natural stream channel.

Reference Appendix A for detailed description of effects. If internal piping or plugging of the Wyant Lake Dam conduit ultimately lead to a breach of the main embankment at Wyant, then Canyon Dam, after breaching, would be able to adequately accommodate this event without overtopping Canyon Dam.

The existing Canyon Lake surface is approximately 40 acres as compared to the original natural lake, which was approximately 12 acres in size. The dam breach will result in a temporary mud flat.

Option D

Phase 1

The primary hazard to downstream life and property shall be addressed within the next field season, or the summer of 2003. This will be accomplished by a partial breach, or modification to the dam embankment that restricts the storage capacity of the reservoir to that which no longer presents a risk of loss of life in the event of dam failure. The reduction in hydraulic height, from over 20 feet down to 7 feet (preliminary estimate), represents a reduction of over two-thirds in hydraulic height. Therefore, the basic design criteria for the modified structure is the reduction in hazard classification from a high hazard classification to a moderate or low hazard classification (FSM 7511.2). In the case of Canyon Dam, the reservoir level will be restricted to a level that no longer presents a risk to overtopping the Westside Road and inundating a residence downstream of this road.

The basic plan is separated into three parts:

1. The rock shell must first be removed from the embankment in the area of the proposed breach area, located over the existing outlet works.
2. Remove material to the required elevation (preliminary estimate is 200 to 400 cubic yards material, including rock and soil).
3. Armor the breach with rock removed from the embankment and temporarily stockpiled.

A combination of rock drills and explosives, or Boulder BusterTM, may be necessary to break up the larger rock located on the embankment which cannot be moved by manual labor. (The outer protective shell consists of rock that varies in diameter - up to 18 inches on the upstream side and up to 3 to 5 feet on the downstream side of the embankment). The rock will be temporarily stockpiled, then re-used and placed back onto the embankment to armor the breach after excavation is completed to the required level. The use of explosives will be controlled by smaller, more frequent shots to minimize impacts to fisheries and prevent scattering material all over the landscape.

Two plans to accomplish this work are described in detail in Appendix A— an initial plan utilizing manual labor crews and minimal mechanized tools, and a backup plan utilizing traditional excavation equipment if manual labor and minimal tools are not adequate to complete the required work.

Phase 2

Canyon Lake Dam

Canyon Dam would be reconstructed during the summer field season of 2004 to maintain reservoir capacity for irrigation uses in the future.

The purpose of the long-term reconstruction is to rehabilitate Canyon Dam to meet federal dam safety standards and correct the deficiencies noted in past engineering inspections by DJ Engineering, and the recent geotechnical investigation of the embankment by Hydrometrics, Inc. (October 2002).

Wyant Lake Dam

Wyant Lake Dam would have the existing, primary spillway crest lowered approximately 12 feet and construct a small weir to retain lake sediments and direct low flows to the existing outlet works conduit. Therefore, base creek flows will continue to flow in the historic channel below the dam.

The Wyant Lake Dam structure shall be left in a condition where dam failure would not likely result in loss of human life. The hazard assessment will determine the level to which the dam shall be breached. If unforeseen problems are encountered at the principal spillway location, such as extensive rock that interferes with the constructability of the breach, then another location may be selected. The alternative breach location would most likely be in the vicinity of the outlet works near the natural stream channel. The breach of Wyant Dam is planned for year 2004.

Alternative 3

Alternative 3 would require an additional season in order to reconstruct the Canyon trail and construct new trail between Canyon Lake and Wyant Lake Dams. Actual work on the dam would then be done the next field season. This could affect the ability to accomplish needed work within limited timeframes.

Use of pack stock to transport supplies where feasible would be done in conjunction with helicopter transport and would not significantly affect timeframes of necessary work.

WILDERNESS, TRAILS AND RECREATION

Existing Condition/Affected Environment

The affected environment for the proposed project is in the Canyon Creek drainage, including Forest Road # 735 leading to the trailhead, Trail #101, (Blodgett Overlook), Trail #525 (Canyon Creek Trail), and the basin surrounding Canyon and Wyant Dams. Portions lie both inside and outside of the Selway-Bitterroot Wilderness.

Wilderness

The Selway-Bitterroot Wilderness lies within the Bitterroot, Nez Perce, Clearwater and Lolo National Forests. General management direction is contained in a document incorporated by reference in all four Forest Plans during 1992. The Selway-Bitterroot Wilderness, third largest wilderness in the lower 48 states, totals 1.3 million acres and the Bitterroot National Forest contains 508,000 acres of this total.

A unique characteristic of this wilderness is the presence of sixteen irrigation dams all established before the 1964 Wilderness Act and some established before designation of the Bitterroot National Forest.

General wilderness characteristics of this drainage are summarized in five categories:

1. Natural integrity refers to the extent long-term processes are intact and operating, and is measured by the presence and magnitude of human induced change. The impacts of human activity are generally light, with the exception of the Canyon and Wyant Dams, Trail #525 and campsites.
2. Apparent naturalness is indicated by how the environment looks to most people using the area. Human activities are primarily confined to the narrow trail corridor and the area immediately adjacent to the dams and reservoir. The remainder of the area is topographically extreme and discourages human activity. Humans have had a minor impact in these areas through the suppression of fires.
3. Remoteness is a perceived condition of being secluded, inaccessible and out of the way. The presence of humans is apparent in the trail corridor and immediate lake area. Any remoteness is experienced due to the topographic relief and vegetation screening.
4. Solitude is a personal, subjective value defined as isolation from the sight, sound and presence of others and the developments of humans. The feeling of solitude in its purest sense is not available within the trail corridor or lake basin. Encounters are frequent in the trail corridor and lake basin. The tight topography of the lake basin allows sounds of visitors to carry easily.
5. Special features are those unique geological, ecological, cultural or scenic features that may be located in wilderness. Notable features include spectacular scenery, air quality, wildlife and opportunities for wilderness related activities.

The wilderness is divided into four Opportunity Classes (OC) developed to allow for and provide a range of wilderness experience, from the most pristine Opportunity Class 1 to most heavily used Opportunity Class 4. Characteristics are based on standards as described in the Forest Plan. The affected environment is in Opportunity Class 4. Although the natural environment is generally unmodified, there are many locations substantially affected by the actions of users. Canyon and Wyant Lakes are located in a square mile classified as a Problem Area, defined as “locations within the Selway-Bitterroot Wilderness where conditions do not meet one or more specified standards.” Impacts are evaluated using standardized procedures that measure various impacts, including vegetation loss, soil disturbance, damage to trees, development, cleanliness, etc. This area has ten campsites (four lightly impacted, three moderately impacted and three heavily impacted). Standards limit the number of campsites to four (and impacts to one light, two moderate and one heavy or extreme). The area is high elevation and the fragile vegetation is vulnerable to stock damage.

Recreation

The Recreation Opportunity Spectrum (ROS) ranges from Roaded Natural at the Canyon Creek trailhead to Primitive within the Selway-Bitterroot Wilderness.

Canyon Creek's proximity to Hamilton makes it a popular day and overnight use area during the snow-free season. Visitors have diverse recreational opportunities, including hiking, horseback riding, hunting, fishing, berry picking, rock climbing, and photography.

Trails

Visitor use on Canyon Trail #525 is primarily hiking, most often as day use in the first 2-3 miles. The trail is constructed to Canyon Lake and is maintained annually to accommodate heavy foot traffic during the summer use season. The trailhead does not have a stock ramp and has limited turning space or parking for stock trailers. The trail climbs through a rough boulder area below Canyon Lake, including two short stretches that are hazardous to stock. Few users are willing to negotiate these sections with stock. There is no trail to Wyant Lake.

Regulatory Framework and Forest Plan Consistency

The Wilderness Act of 1964 does not specifically address the method of access to wilderness dams. In Section 5(b) it states "In any case where valid mining claims or other valid occupancies are wholly within a designated forest wilderness area, the Secretary of Agriculture shall, by reasonable regulations consistent with the preservation of the area as wilderness, permit ingress and egress to such surrounding areas by means which have been or are being customarily enjoyed with respect to such other areas similarly situated."

The project is located in the Forest Plan Management Area 7c. The goals for Management Area 7c are to "manage in accordance with the Wilderness Act of 1964... to ensure an enduring system of high quality Wilderness..."

Direction for Bitterroot National Forest management of the wilderness portion of the affected area is contained in the Selway-Bitterroot Wilderness General Forest Plan Management Direction (Forest Plan Amendment #7, 1992) (PF 3.7). This amendment established the following goals for the Selway-Bitterroot Wilderness.

- Preserve the integrity of the Selway-Bitterroot Wilderness resource to meet the purposes described in the Wilderness Act; to protect and preserve natural conditions so that the wilderness generally appears to have been affected primarily by the forces of nature, with the imprint of human work substantially unnoticeable, and has outstanding opportunities for solitude or primitive and unconfined recreation.
- Provide for limiting and distributing visitor use of specific portions in accordance with periodic estimates of the maximum levels of use that allow natural processes to operate freely and that do not impair the values for which wildernesses were created.

- Apply a Prevention of Significant Deterioration (PSD) approach to prevent a net degradation of the wilderness resource while acknowledging that wilderness, and the impacts caused therein, is dynamic.

The Bitterroot National Forest Plan notes in Amendment #7, page M-1 (PF 3.7) that many special use dams exist in the Wilderness, that they need to be maintained to a safe condition, and may need mechanical access and motorized equipment to maintain at least some of them.

The Bitterroot National Forest Plan specifies in Amendment #7, Section II, M-2 (PF 3.7): Environmental assessments or environmental statements will be prepared for all reconstruction and heavy maintenance work on reservoirs within the wilderness. These reports will include analysis of non-motorized vs. motorized means of doing work. Motorized equipment or other non-conforming activities will be authorized when it can be demonstrated that:

- It is the only feasible means of accomplishing the necessary maintenance.
- The continued existence of the reservoir is more in the public interest than it's breaching.

Feasibility for the use of primitive equipment will be based on the technical requirements of the project. While a part of this analysis will include economic considerations, economics is not an overriding factor in the justification for the use of motorized equipment.

Section II, A-3 specifies: "The minimum tool principle will be applied to the management of all resources within the Selway-Bitterroot Wilderness. This means that the minimum management actions necessary to correct a given problem will be identified. These will be implemented using the methods and equipment that accomplish the objective with the least impact on the physical, biological and social characteristics of wilderness."

A Minimum Requirements Decision Process was used to evaluate the minimum tool necessary to accomplish proposed work and methods of access. This process is documented in PF 1.2 and summarized in Appendix F.

Environmental Consequences

Introduction

This section will discuss and disclose the environmental effects of this project on the wilderness, trails and recreation resources of the Canyon Creek drainage from its headwaters at Romney Ridge to the wilderness boundary (approximately 3.5 miles) and also from the wilderness boundary to the Canyon Creek trailhead (approximately 1.5 miles).

Effects are measured using parameters determined through public scoping and by using criteria in the Forest Plan (1987) and in the Selway-Bitterroot Wilderness General Forest Plan Management Direction (Amendment #7). These documents disclose standards and management direction for the Selway-Bitterroot Wilderness, trails and recreation.

The environmental consequences of each alternative will be discussed and evaluated within the context of three settings: the wilderness resource setting (natural integrity, apparent naturalness, remoteness, solitude and special features); the trails and general recreation setting; and the wilderness regulatory setting (applicable laws, regulations and policies that effect activities related to wilderness and worker safety).

Effects Common to All Alternatives

Direct Effects

Wilderness Resource Setting

In all alternatives, the presence of Canyon and Wyant Lake Dams affect the wilderness resource. The natural integrity of water flows is restricted by the storage and release of water from the reservoir (reference sections on Water Resources under Physical Environment and Fisheries under Biological Environment for further descriptions). Apparent naturalness and visitor's sense of remoteness are affected by visual evidence of human structure. These effects are considered acceptable within the parameters of the Wilderness Act and subsequent legislation.

Cumulative Effects

Wilderness Resource Setting

In all alternatives, it is unlikely there would be cumulative effects to the wilderness resource.

Effects Common to Action Alternatives

Direct Effects

Wilderness Resource Setting

In both action alternatives, a breach would improve the natural integrity of the Canyon Creek watershed by allowing natural lake levels, run-off and stream flows. The actual work, presence of workers and transportation of workers/equipment would affect visitor's sense of remoteness and solitude through the duration of work. Sights and sounds of helicopter transport and mechanized equipment would be apparent on trails and throughout the lake basin. These sights and sounds would be intrusions on visitor's sense of remoteness and solitude. Effects would be greater with Options B and D (major rehabilitation) than with Option A (boring), or Option C (breach), because of the increased time required to complete work. Special features would not be affected by any of the action alternatives.

Trails and General Recreation Setting

In both action alternatives, some minor reconstruction would be done on Canyon Creek Trail #525 during Phase 1, Option D to accommodate minimal stock transport. Recreational restrictions in the vicinity of work at Canyon and Wyant Lakes would depend on the location and

timing of work and on safety considerations. The need for area closures during work would affect visitor access, at Canyon and Wyant Dams during the entire work project and on the trail when helicopters were used for transport. Areas not directly involved in work projects would remain open to use. For instance, visitors would be allowed access to Wyant Lake if no work is occurring or to the west end of Canyon Lake throughout work. These effects would be greater with Options B and D (major rehabilitation), than with Option A (bore), or Option C (breach) because of the increased time required to complete work. In both action alternatives, visitor enjoyment would be affected by trail restrictions during helicopter operations less than if Canyon Dam were breached.

Indirect Effects

Wilderness Resource Setting

In both action alternatives, reconstruction would have more effect to apparent naturalness than a breach, since new areas would be used for fill material sources and there would be visible additions to the dam's structure (trash racks, rock work, an additional spillway, etc.). Options B and D (major rehabilitation) would have more effect than Option A (bore), or Option C (breach), because they would have the greatest disturbance to surrounding vegetation and soils and result in the longest re-vegetation period. After this recovery period natural integrity, apparent naturalness and solitude (isolation from the developments of humans) would be positively affected. A breach would have an additional benefit to visitor solitude. Since there would be no vegetation to screen campers near the original shoreline, use would probably continue at existing campsites. This would maintain use about 200 feet from water and reduce social encounters around the lakes.

Trails and General Recreation

In both action alternatives, a breach at Canyon Lake would reduce lake capacity and leave the existing shoreline exposed (comparable to the way it looks in the fall after the lake's drawn down by irrigators), and would degrade visitor experience. This effect would gradually diminish (over approximately 20 years) as vegetation/trees naturalize the area between the existing and original shorelines. Recreational fishing opportunities would be affected by the smaller lake capacity and its' reduced ability to support fish over the winter. A breach at Wyant Dam would have minimal effects to recreational use since it would be a partial breach (leaving less visual effects or changes to water levels) and since few visitors access Wyant for fishing.

Wilderness Regulatory Setting

In both action alternatives, work to make both dams safe would benefit the wilderness regulatory setting by reducing or eliminating the number of requests in the future for heavy maintenance to provide for temporary fixes to dam safety problems and associated requests to use mechanized transport or motorized equipment. Worker safety would be improved if heavy maintenance needs are reduced and greatly improved to the extent heavy maintenance needs are eliminated.

This project is in compliance with Forest Plan standards for Management Area 7c, the SBW General Management Direction, and the Wilderness Act.

Alternative 1

Direct Effects

Wilderness Resource Setting

There would be no work at either Canyon or Wyant Dams and therefore no immediate disturbance to existing natural integrity, apparent naturalness, visitor's sense of remoteness and solitude, or special features.

Trails and General Recreation Setting

There would be no additional use of the trail structure. There would be no additional use at the parking area or on the trail and no area closures.

Wilderness Regulatory Setting

There would be no use of mechanized or motorized equipment. There would be no increase of use at campsites and therefore no change in the lake basin's problem area status. There would be no effects to worker safety.

This alternative is beyond the Forest Service legal discretion, because the agency cannot deny the CCID reasonable access for the valid use of their easement. (see p. 1.2)

Indirect Effects

Wilderness Resource Setting

The wilderness resource would be affected if the dam fails as a result of not being made safe (through reconstruction or breach). There would be severe soil movement, drainage scouring and vegetation damage that would be an irreversible consequence of human activity. This soil movement has the potential for effects to natural integrity (changing stream channels and opening areas to noxious weeds), apparent naturalness (as a result of trail or watershed repairs) and special features (especially in areas between Canyon Lake and the falls).

Trails and General Recreation Setting

The dam could fail sometime in the future as a result of not being made safe through reconstruction or breach. This would result in severe erosion of the Canyon Trail #525 in numerous locations close to the creek. This trail damage would temporarily limit visitor access and be costly to repair.

Wilderness Regulatory Setting

Repeated heavy maintenance requests to provide temporary fixes to dams safety problems would take place and there would be frequent requests to use mechanized transport or motorized equipment. If the dam fails as a result of not being made safe through reconstruction or breach, worker safety would be compromised.

Cumulative Effects**Wilderness Resource, Trails and General Recreation, Wilderness Regulatory Settings**

It is unlikely that there would be any cumulative effects or connected actions associated with this alternative. There are no other connected or anticipated activities in this part of the Selway-Bitterroot Wilderness. There are no additional planned activities in the drainage area, except for routine trail and/or dam maintenance. There would be no impacts to existing campsites from workers use and no worsening of the lake basin's problem area status.

Alternative 2**Direct Effects****Wilderness Resource Setting**

Work would be accomplished over a one-year-field-construction season in Options A, B, or C. Work would be accomplished over a two-year-field-construction season in Option D. Most work would occur in previously disturbed areas. Special features would not be directly affected.

Trails and General Recreation Setting

There would be minimal effects to Canyon Trail #525 since primary access for workers and equipment would be by helicopter or foot. In Option D, approximately 4 to 5 stock trips, each with 10 head of stock, would be required to transport equipment and supplies to Canyon Dam. Work would affect visitor experience during a one-year field construction period for Option A, B or C. Work would affect visitor experience during a two-year field construction period for Option D (see Effects Common to Action Alternatives).

Wilderness Regulatory Setting

A Minimum Requirements Decision Process (PF 1.2) has determined that this alternative meets Forest Plan direction to employ methods and equipment that are the minimum management actions necessary to accomplish the purpose and need for action and to accomplish the objectives of each alternative with the least impact on the physical, biological, and social characteristics of wilderness (Selway-Bitterroot Wilderness, General Management Direction, 1992, page A-1. (PF 3.7). The lake basin's problem area status would probably not be affected, because existing campsites would be used and there would be minimal stock containment. Worker safety would

be affected by hazards associated with helicopter transport and actual work at the dams during a one-year period for Options A, B or C or a two-year period for Option D.

Indirect Effects

Wilderness Resource Setting

See Effects Common to Action Alternatives.

Trails and General Recreation Setting

See Effects Common to Action Alternatives.

Regulatory Setting

The lake basin's problem area status would not be affected.

Cumulative Effects

Wilderness Resource, Trails and General Recreation, Wilderness Regulatory Settings

It is unlikely that there would be any cumulative effects or connected actions associated with this alternative. There are no other connected or anticipated activities in this part of the Selway-Bitterroot Wilderness. There are no additional planned activities in the drainage area, except for routine trail and/or dam maintenance. There would probably not be impacts to existing campsites from workers use over one season and no worsening of the lake basin's problem area status.

Alternative 3

Direct Effects

Wilderness Resource Setting

Work would be accomplished during a two-year or longer period. In option A, B or C the first year would be spent reconstructing the Canyon Trail #525 and construction on trail between Canyon and Wyant Lakes to accommodate stock transport. For Option D, During Phase 1, major trail reconstruction/construction needs would be evaluated. It is possible that some trail reconstruction/ construction would begin the same year. Preceding and concurrent with Phase 2, major reconstruction would continue or occur on Canyon Trail #525 and construction would continue or occur on a trail between Canyon and Wyant Lakes. If Canyon Dam were reconstructed, existing natural integrity would be affected by construction of the new trail to Wyant Lake and associated impacts to wildlife habitat. Visitor sense of remoteness and solitude would be affected along the trail while workers and equipment are transported, both by the sight and sound of helicopters (considered an intrusion to wilderness) and by stock transport (considered a traditional wilderness method of transport, but one not commonly used in the Canyon Creek drainage). The sense of remoteness and solitude would also be affected by

improved access to Wyant Lake that would result in increased visitation. Apparent naturalness would be affected by the visual impacts associated with a new trail to Wyant Lake (vegetation damage and exposed cut banks). Special features would not be directly affected.

Trails and General Recreation Setting

Reconstruction of Canyon Creek Trail #525 would be required on approximately one half mile (numerous steep or boggy sections and on ¼ mile of talus slope). New construction would be required on approximately one mile between Canyon and Wyant Lakes. Parking facilities would be expanded to accommodate stock trailers and trailer turn-around areas. Costs of major trail reconstruction/construction would add to the cost of the project. There would be no restrictions on the trail during stock transport but visitors would be inconvenienced (at the parking area and by encounters with stock along the trail). Visitor encounters with stock would occur during two years of both trail construction/reconstruction and materials transport to the dams. Between 60 and 100 stock trips, each with 20 head of stock, would be required to transport materials if Canyon Dam is reconstructed and Wyant is breached. Approximately 20 to 30 stock trips would be required if both dams were breached. Stock transport of material for work at the dams would result in damage to tread and drainage structures, requiring follow-up reconstruction.

Wilderness Regulatory Setting

The lake basin's problem area status would be affected by increased impacts at existing campsites, by both trail crew and dam work camps, by stock use and containment. Additional campsites at Wyant Lake would be created if access were made easier by a new trail. Worker safety would be affected by hazards associated with helicopter and stock transport, actual work at the dams, and trail work during a two-year period.

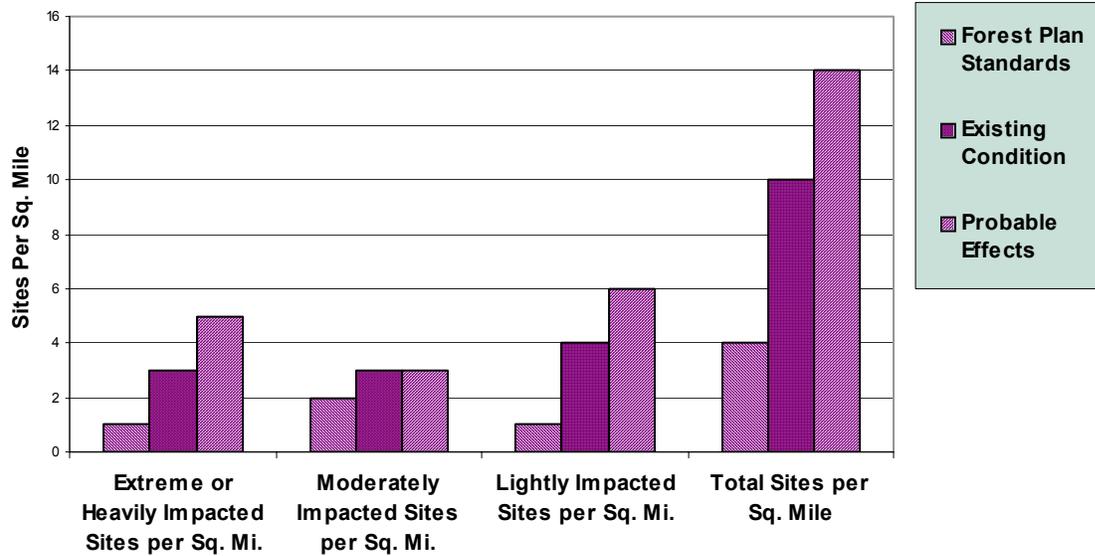
Indirect Effects

Wilderness Resource Setting

Natural integrity would be affected by the introduction of non-native and noxious weeds that would occur if a new trail is constructed to Wyant Lake (reference section on Sensitive Plants and Noxious Weeds under Biological Environment for further descriptions). Visitor's sense of remoteness and solitude would be affected by an increase of use associated with improved ease of access. This increased use (especially of stock) would result in added impacts to campsites in the drainage (see chart 3.1).

Chart 3.1:

Wilderness Forest Plan Standards - Probable Effects of Alternative 3



Trails and General Recreation Setting

There would be increased stock use on Trail #525 and the new trail between Canyon and Wyant Lake. The additional effects to trail tread and drainage structures would result in additional maintenance requirements. A trail to Wyant Lake and a larger parking area at the trailhead would provide easier access for backpackers and stock users to the lake basin.

Wilderness Regulatory Setting

Reconstructing/constructing the trail system to accommodate stock use would reduce need to use helicopters for access but would result in added impacts to campsites and the lake basin’s problem area status.

Cumulative Effects

Wilderness Resource, Trails and General Recreation Setting

It is unlikely that there would be any cumulative effects or connected actions associated with this alternative. There are no other connected or anticipated activities in this part of the Selway-Bitterroot Wilderness. There are no additional planned activities in the drainage area, except for routine trail and/or dam maintenance

Wilderness Regulatory Setting

Increased foot and stock use to Canyon and Wyant Lakes as a result of new and reconstructed trails would degrade the lake basin's problem area status. Management action connected to this problem area and other high elevation lakes vulnerable to stock damage may necessitate restrictions to visitor use.

HERITAGE RESOURCES

Existing Condition/Affected Environment

Wyant Lake Dam (24RA549) was constructed between 1902 and 1909 to provide late summer irrigation water for farmers, ranchers and other property owners west of Hamilton. It was operated by the Canyon Creek Irrigation District under a special use permit after 1909. In 1995, a pre-Forest easement was recognized for both Canyon and Wyant Lake Dams. No major reconstructions or alterations have occurred at the dam, so it retains its historic appearance and design and will almost certainly be determined eligible for the National Register of Historic Places.

Canyon Lake Dam (24RA550) was built in 1891, and underwent reconstructions in 1972 and again in 1996. These reconstructions substantially altered the dam's original design, and it was determined 'Not Eligible' for the National Register in 1997.

See Appendix B for summary of Canyon and Wyant Lake Dams history.

Much of the area surrounding Canyon and Wyant Lakes fall into a moderate-to-high probability category for occurrence of cultural resources. The entire Canyon Lake basin has received previous cultural resource survey (1996 and 2001), while only the dam itself has received survey in the Wyant Lake basin (2001). Two previously recorded sites exist within the proposed project areas.

Canyon Lake Dam (24RA550) was determined 'Not Eligible' for the National Register of Historic Places on June 6, 1997. There are no cultural resource concerns pertaining to maintenance, repairs, reconstruction or breaching of the dam itself. A prehistoric site, 24RA541, may be eligible for the National Register. Because it has received no formal evaluation, it must be managed as an Eligible Property. It is located within the Canyon Lake basin, but well outside the area of potential effect (APE) for the proposed project. 24RA541 will not be affected by the proposed action, provided that all project-associated activities such as stock confinement or grazing, camping and latrine areas, borrow sites, etc. avoid the 24RA541 location. Prehistoric site 24RA541, in the Canyon Lake Basin, will be evaluated to have its eligibility status formally determined during the summer of 2003. Site 24RA541 is an unevaluated site and needs to be evaluated from a heritage resource management perspective.

The Montana State Historic Preservation Officer determined Wyant Lake Dam (24RA0549) Eligible for the National Register of Historic Places on February 3, 2003. On the same date, Montana SHPO concurred that the proposed breaching via deepening of the existing spillway

(previously enlarged in 1971) and the opening of the outlet gate would constitute No Adverse Effect to the Wyant Dam historic property. It is clearly eligible, based on its integrity of setting, location, design, materials, workmanship, association, and feeling; and on its significance for its association with the agricultural/irrigation history of the Bitterroot Valley and its exemplification of high elevation dam structures in the Mountain West. Although the dam itself was resurveyed on August 7, 2001, the area (basin) surrounding Wyant Lake has received a cultural resource inventory in the fall of 2002. No other sites were found to be present in the Wyant Lake basin.

The Confederated Salish and Kootenai Tribes of the Flathead Reservation regard the entire Bitterroot Forest as an area of concern, and are consulted on all projects occurring within the Forest. Tribal consultation has been completed regarding this project, with no cultural concerns identified other than the need to complete the survey of the area surrounding Wyant Lake.

Environmental Consequences

Alternative 1

The no action alternative would have no effect on Wyant Lake Dam. The no action alternative would have no effect on any of the other sites in the area of potential effect.

All action Alternatives

Direct Effects

As described, the proposed action involves no activities that would affect Prehistoric site 24RA541 in the Canyon Lake Basin. No additional cultural resource work is needed regarding Canyon Lake Dam (24RA550), which has been determined 'Not Eligible' for the National Register of Historic Places. Rehabilitation or breaching of the Canyon Lake Dam will not affect a significant historic property. The other known cultural site at Canyon Lake, 24RA541, is well outside the area of potential effect (APE) for rehabilitation or breaching of the dam and will not be affected by activities associated with this proposed action. However, 24RA541 should be evaluated by Bitterroot Forest Heritage specialists during the summer of 2003, in order to have its eligibility status formally determined.

The Montana State Historic Preservation Officer determined Wyant Lake Dam (24RA0549) Eligible for the National Register of Historic Places on February 3, 2003. On the same date, Montana SHPO concurred that the proposed breaching via deepening of the existing spillway (previously enlarged in 1971) and the opening of the outlet gate would constitute No Adverse Effect to the Wyant Dam historic property.

Regulatory Framework

The primary legislation governing modern heritage resource management is the National Historic Preservation Act (NHPA) of 1966 (amended in 1976, 1980, and 1992). All other heritage resource management laws and regulations support, clarify, or expand on the National Historic Preservation Act. Federal Regulations 36 CFR 800 (Protection of Historic Properties), 36CFR 63 (Determination of Eligibility to the National Register of Historic Places), 36 CFR 296 (Protection of Archaeological Resources) and Forest Service Manual 2360 (FSM2360) provide

the basis of specific Forest Service heritage resource management practices. These laws and regulations guide the Forest Service in identifying, evaluating, and protecting heritage resources on National Forest system lands. The Forest Service is required to consider the effects of agency actions on heritage resources that are determined eligible for the National Register of Historic Places (NRHP) or on heritage resources not yet evaluated for eligibility. Eligible Heritage Guidelines for Archaeology and Historic Preservation are also an important element of federal agencies' management of cultural resources on public lands.

Several other laws address various aspects of heritage resource management on the National Forests, including the National Environmental Policy Act of 1969 (NEPA), the National Forest Management Act of 1976 (NFMA), the Antiquities Act of 1906, the Historic Sites Act of 1935, and the Archaeological Resource Protection Act of 1979, as amended in 1988 (ARPA). ARPA and two other regulatory acts describe the role of Tribes in the federal decision-making process, including heritage management. ARPA requires Tribal notification and consultation regarding permitted removal of artifacts from federal lands. The Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) recognizes Tribal control of human remains and certain cultural objects on public lands and requires consultation prior to their removal. The American Indian Religious Freedom Act of 1978 (AIRFA) requires federal agencies to consider the impact of their actions on traditional Tribal cultural sites. The National Historic Preservation Act (NHPA) also specifically calls for Tribal participation in the NHPA Section 106 consultation process.

ECONOMICS

Existing Condition/Affected Environment

CCID owns the Canyon and Wyant Lake Dams and is responsible for the operation and safety of Canyon Lake Dam and Wyant Lake Dam. CCID is responsible to pay for the rehabilitation or breaching of these dams. The following costs are listed only for comparison purposes. The costs are based on those in David Jones memo to CCID on July 11, 2002 (PF 3.8).

The CCID has obtained approximately \$500,000 in available state grants and conservation project loans. Funding from the State of Montana DNRC (Department of Natural Resources and Conservation) was awarded to the Canyon Creek Irrigation District for the purpose of conserving water resources. A \$200,000 grant and \$300,000 low interest loan is available to the district only if the major water supply (Canyon Dam) is rehabilitated. This money can only be applied to dam repair work and not to breaching of dams. Any additional costs will be assessed to the 262 members of the District based on the number of acres owned (ranging from 2 to 400). Many members are situated on sub-divided property that no longer has access to or use for irrigation water. Members are very concerned about costs associated with proposed work.

Environmental Consequences

Effects of Alternatives

Alternative 2, Option A and Option B

The Canyon Creek Irrigation District has limited funds provided by shareholder's tax assessments. Canyon Lake Dam currently stores between 420 and 450 acre-ft of water, and Wyant Lake Dam currently stores about 54 acre-feet.

The cost to rehabilitate Canyon Lake Dam and breach Wyant Lake dam, Alternative 2, Option A, is approximately \$538,000. (All figures are estimated - \pm \$150,000). The cost of Option B is estimated to be \$1,100,000.

The cost to rehabilitate Canyon Dam would be offset by a \$200,000 grant. A \$300,000 low interest loan would also be applied towards the cost of rehabilitating Canyon Lake dam.

Alternative 2, Option C

Neither the grant funding nor the loan funding are available for breaching Canyon Lake Dam or breaching Wyant Lake Dam, and the shareholders would be responsible for all breach costs. The cost to breach both dams is estimated to be \$301,000 (and no available grant or loan funding).

The Table 2.11, displays estimated selected costs to CCID to implement the alternatives. These costs are only relative values, and may be used only to compare alternatives. These costs for dam rehabilitation and breach are estimated at \pm \$150,000. Costs are listed per activity and alternative. Revegetation costs would be included in the costs of the rehabilitation or breaching the dams.

Alternative 2, Option D

The cost to rehabilitate Canyon Lake Dam and breach Wyant Lake dam, Alternative 2, Option D is estimated to be:

Phase 1, Part 1: \$80,000 to \$100,000;
if part 2 is necessary total cost of Phase 1 is estimated to be \$180,000 to \$200,00

Phase 2, \$800,000 to \$1,000,000

Total Cost of Option D is estimated to be from \$880,000 to \$1,200,000.

(All figures are estimated - \pm \$150,000)

The cost to rehabilitate Canyon Dam would be offset by a \$200,000 grant. A \$300,000 low interest loan would also be applied towards the cost of rehabilitating Canyon Lake dam.

Alternative 3, Option A and Option B

The Canyon Creek Irrigation District has limited funds provided by shareholder's tax assessments. Canyon Lake Dam currently stores between 420 and 450 acre-ft of water, and Wyant Lake Dam currently stores about 54 acre-feet.

The cost to rehabilitate Canyon Lake Dam and breach Wyant Lake dam, Alternative 2, Option A, is approximately \$638,000. (All figures are estimated - \pm \$150,000). The cost of Option B is estimated to be \$1,200,000. Estimated costs for trail construction and reconstruction work of \$100,000 is added to costs to rehabilitate and breach dams.

The cost to rehabilitate Canyon Dam would be offset by a \$200,000 grant. A \$300,000 low interest loan would also be applied towards the cost of rehabilitating Canyon Lake dam.

Alternative 3, Option C

Neither the grant funding nor the loan funding are available for breaching Canyon Lake Dam or breaching Wyant Lake Dam, and the shareholders would be responsible for all breach costs. The cost to breach both dams is estimated to be \$401,000 (and no available grant or loan funding). Estimated costs for trail construction and reconstruction work of \$100,000 is added to costs to rehabilitate and breach dams.

The Table 2.11, displays estimated selected costs to CCID to implement the alternatives. These costs are only relative values, and may be used only to compare alternatives. These costs for dam rehabilitation and breach are estimated at \pm \$150,000. Costs are listed per activity and alternative. Revegetation costs would be included in the costs of the rehabilitation or breaching the dams.

Alternative 3, Option D

The cost to rehabilitate Canyon Lake Dam and breach Wyant Lake dam, Alternative 2, Option D is estimated to be:

Phase 1, Part 1: \$80,000 to \$100,000;
if part 2 is necessary total cost of Phase 1 is estimated to be \$180,000 to \$200,00

Phase 2, \$800,000 to \$1,000,000

Total Cost of Option D is estimated to be from \$980,000 to \$1,300,000.
(All figures are estimated - \pm \$150,000)

Estimated costs for trail construction and reconstruction work of \$100,000 is added to costs to rehabilitate and breach dams. The cost to rehabilitate Canyon Dam would be offset by a \$200,000 grant. A \$300,000 low interest loan would also be applied towards the cost of rehabilitating Canyon Lake dam.

Costs to Forest Service

Alternative 1

Routine engineering dam monitoring and inspection costs could increase by \$750 annually.

Alternative 2

Cost to the Forest Service of monitoring dam project work at Canyon and Wyant Lake Dams is estimated for Option A, B or C to be \$8355 and for Option D to be \$13,470.

Alternative 3

In addition to the monitoring costs in Alternative 2, costs of monitoring trail project work is estimated at \$4000. Total estimated cost to the Forest Service for monitoring would be estimated for Option A, B or C to be \$12,355 and for Option D to be \$17,470.

PHYSICAL ENVIRONMENT

WATER RESOURCES

Existing Condition/Affected Environment

Introduction

This section details water resources that could potentially be affected by the Canyon – Wyant Reservoirs dam rehabilitation project. The existing and desired resource conditions are discussed.

Analysis Area

The water resources that may be affected by the alternatives are those downstream of the two dams and adjacent to and within the reservoirs. This would include the channel of Canyon Creek between Wyant and Canyon reservoirs, below Canyon reservoir, and their adjacent streamside or riparian areas. This includes the stream channel all the way to the Bitterroot River. Those riparian or wetland areas adjacent to Wyant and Canyon reservoirs may also be affected. Cumulative effects analysis is also limited to the Canyon Creek 6th level watershed.

Physical Description and Existing Condition

Canyon and Wyant Reservoirs are located on National Forest Lands in the Bitterroot Mountains almost due West of Hamilton, Montana. Both are within the upper reaches of the Canyon Creek drainage, from 7,000 to 7,500 feet elevation. Water stored in both reservoirs is used mainly for irrigation on private lands. Wyant, the uppermost reservoir, holds approximately 54 acre-feet of water, while Canyon Reservoir is listed as storing 420 to 450 acre-feet. Contributing area above the reservoirs is estimated at 900 acres.

Canyon Creek qualifies as a sixth-level watershed and is designated with the hydrologic unit code (HUC) of 170102051004. The Montana Rivers Information System considers it to have 8.6

miles of channel supporting perennial flow before it joins the main stem of the Bitterroot River near Hamilton. Total watershed area (all jurisdictions) is approximately 15,533 acres.

Most precipitation occurs as snowfall between October and April. Summer months bring cool to moderately warm, dry weather and occasional rainfall. Snow depths in the upper basin can reach as high as 20 feet, but 5 to 10 feet is more typical around the reservoirs. Average annual precipitation is about 70 inches at the lower reservoir (Canyon) and ranges up to about 100 inches at the upper watershed divide.

Flows in upper Canyon Creek follow typical snowmelt patterns. High flows occur during the snowmelt peak in May and June, and recede to low flows in late summer and fall. Low flows are maintained throughout the winter until the following spring melt. The reservoirs affect flow in the stream reaches below the dams. Generally, the storage of snowmelt water near the end of the spring melts, lowers peak flows in June and early July. Release of water beginning in late July increases the base flow level until the reservoirs are drained, usually in late September or early October. Lower in the canyon, drainage area that is not controlled by the dams dominates the flow regime and less reservoir effect is seen.

Canyon Creek is typical of streams flowing out of the West side of the Bitterroot basin. On National Forest Lands, its channel is a steep, boulder/cobble type with little fine sediment. The banks are well armored with large rock and thick vegetation appropriate for the spruce-fir forest type through which it flows. The channel is generally well confined by rocky banks and forest. Watershed geomorphic integrity in this canyon was rated as “good” before the 2000 fires. The watershed has mainly granitic geology and displays typical glacial effects of a u-shaped canyon and glacial outwash fans at the canyon mouth. The upper reaches (on National Forest) can be expected to transport water and sediment efficiently, with little impact to stream banks or channel bed. Lower reaches within the fans are somewhat more sensitive to high flow events, and some channel adjustments are to be expected.

The 2000 fires affected small areas within the Canyon Creek watershed, with most burned area being rated at “low” severity. Watershed ratings assigned before the fires are expected to still be applicable due to the small amount of burned area. Only 2% of the watershed area was rated as being “moderately or severely burned”, and only 3% was rated as low severity burn. As a result of the small areas burned, the potential for overland or “debris” flows is considered very low.

Water quality was rated as “high” before the 2000 fires and is expected to be similar afterwards due to the small areas burned and no significant changes in land use. No stream segments within the 6th-level watershed are listed on the MTDEQ 303(d) list of impaired water bodies, and water quality is considered sufficient to fulfill all pertinent beneficial uses.

Land uses in the basin are quite varied. A large portion of the watershed is located on the Bitterroot National Forest and is within the Selway Wilderness area. Management activities on-Forest in this basin has been essentially limited to trail building and maintenance, along with the private operation of the two dams. A road accessing the trailhead also extends onto National Forest Lands. Off the Bitterroot National Forest, land uses include agriculture, silviculture, ranching, residential, and municipal development.

Water rights are controlled by the State of Montana. The water storage and flow control aspects of the Canyon and Wyant Reservoirs are beyond the scope of this analysis and decision.

Wetlands

Jurisdictional wetlands within the Canyon Creek watershed are somewhat limited. Jurisdictional wetlands are those wet areas that are protected by law through Section 404 of the Clean Water Act. Most are linear features along the margins of the stream channel. Flood-prone areas along the stream, seeps, and springs are the main locations for riparian species within the canyon. Some water-loving or wetland species have utilized habitats made available by the construction and operation of the reservoirs. These areas are generally limited to seepage areas along the dam front. It can also be argued that use of the water impounded in these reservoirs creates some downstream riparian areas through agricultural irrigation.

Wilderness designation has maintained wetlands on the National Forest portion of the watershed in very good to excellent condition. Off-Forest, wetland condition is difficult to summarize. This is due to wetland losses from irrigation diversions, channelization, and hardening of stream banks, contrasting with increases in wetlands from flood irrigation.

Regulatory Framework

The Bitterroot National Forest Plan (USDA 1987) provides direction to protect and manage resources. Only direction pertaining to the water resources portion of the project is included here.

The Forest Plan forest-wide goal for soil and water resources is to:

- Maintain soil productivity, water quality, and water quantity (p. II-3).
- Manage riparian areas to prevent adverse effects on channel stability and fish habitat (p. II- 6).

Forest-wide Management Resource Standards provide further detail:

- Maintain the percentage of “hydrologically unrecovered” area permitted in a landscape within the guidelines of Table II-5 of the Forest Plan. (p. II-24)
- As part of project planning, site-specific water quality effects will be evaluated and control measures designed to ensure that the project would meet Forest water quality goals; projects that will not meet State water quality standards will be redesigned, rescheduled, or dropped. (p. II-24)
- Soil and water conservation practices will be a part of project design and implementation to ensure soil and water resource protection. (p. II-25).

The following Management Areas have further Management Goals and Management Standards that pertain to water resources. (Forest-wide Goals and Standards apply to all.)

MA1, 2, 3a, 3c, 8a: Management Standards:

- Utilize watershed rehabilitation projects such as stabilizing road cut or fill slope slumps to repair problems. (pp. III-6, 12, 18, 33, 59)

MA5: Management Standards:

- Management activities will be designed to protect the municipal watershed.
- Trail improvement or construction will be implemented with emphasis on soil stability and stream protection. (p. III-40)

Other regulatory or legal requirements that direct watershed management are:

- Section 208 of the 1972 amendments to the Federal Water Pollution Control Act (Public Law 92-500), which specifically mandates identification and control of non-point-source pollution resulting from silvicultural activities.
- Clean Water Act, Sections 303, 319, 404. Section 303(d) directs states to list water quality impaired streams (WQLS) and develop total daily maximum loads to control the non-point source pollutant causing loss of beneficial uses. Up until late March 2001, agencies were instructed to use the 1996 Montana 303d list of Water Quality Impaired Streams. The Environmental Protection Agency (EPA) approved the 2000 Montana 303d list in late March 2001. Because the 2000 list was approved late in this analysis, and a 2000 court order to the state to complete TMDL's (water quality standards and restoration plans) for all streams on the 1996 list, both lists are referenced in this report. TMDLs have not yet been developed for Bitterroot National Forest streams. Section 319 directs states to develop programs to control non-point source pollution, and includes federal funding of assessment, planning and implementation phases. At this time, no known Section 319 projects would be detrimentally affected by project activities. Section 404 controls the dredge and fill of material in waterbodies of the U.S.; proposed excavation and construction activities for Canyon and Wyant dams appear to need this federal
- Section 403 of Title IV of the Agricultural Credit Act of 1978 (16 U.S.C. 2201-2205) and Title 7, Code of Federal Regulations, Part 624 (7 CFR 624), the Emergency Watershed Protection Program. The objective of these emergency watershed protection and conservation programs is to assist in relieving imminent hazards to life and property from floods and the products of erosion created by natural disasters that cause a sudden impairment of a watershed.
- ARM 16.20.603 – Best management practices (BMPs) are the foundation of water quality standards for the State of Montana. The Forest Service has agreed to follow BMPs in a Memorandum of Understanding with the State of Montana. Many BMPs are applied directly as mitigations for this proposal. Implementation and effectiveness monitoring for BMPs would be routinely conducted by contract administrators, and during other implementation and annual monitoring events.
- ARM 17.30 Sub-chapter 6 details water quality standards for the State of Montana. The USFS has primary responsibility to maintain these standards on lands under their jurisdiction in the State of Montana.

Designated Beneficial Uses of Local Waters

The Montana Department of Environmental Quality has given all National Forest waters its B-1 classification (ARM 16.20.604). The associated beneficial uses of B-1 waters are drinking, culinary and food processing purposes (after conventional treatment); bathing, swimming and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply.

Water quality is currently maintained and improved through the application of Best Management Practices (BMPs) for controlling nonpoint sources of pollution to surface water. Use of BMPs is the foundation of water quality standards for the State of Montana.¹ In 2000, on Federal lands in Montana, BMP application was rated as 96 percent compliant, and 97 percent effective.

The proposed action has the potential to affect the physical and biological quality of the waters within the project area. The water quality criteria that could be affected are associated with turbidity, water temperature and sediment.²

Desired Condition and Regulatory Consistency

The desired condition for water resources is stated above in the Regulatory Framework section. The implied goal is to meet all regulatory standards for water quality pertinent to the Montana DEQ B-1 classification. Conditions in the Canyon Creek watershed currently meet all pertinent regulatory direction. Water resources are currently meeting the goals stated in the 1987 Bitterroot National Forest Plan (listed above). Water quality presently supports all State-assigned beneficial uses.

Summary

Water resource and watershed conditions in the Bitterroot National Forest portion of the Canyon Creek watershed are considered to be very good. The classified wilderness status of the upper watershed has protected water resources from most human impacts. Minor effects from trail maintenance and use have not degraded water quality or watershed function. Wyant and Canyon

¹ This is documented in ARM 16.20.603 and means “land and management activities must not generate pollutants in excess of those that are naturally occurring, regardless of the stream’s classification”. Naturally occurring as defined by ARM, is the water quality condition resulting from runoff or percolation over which man has no control or from developed lands where all ‘reasonable’ land, soil and where conservation practices (commonly called BMPs) have been applied. Effectiveness of these measures is rated through the State of Montana BMP audit process every other year on a mix of land ownerships where timber harvest has occurred. The results of these audits are published annually by the Department of Natural Resources and Conservation.

² No person may violate the following specific water quality standards for water classified B-1:

(d) The maximum allowable increase above naturally occurring turbidity is 5 nephelometric turbidity units except as permitted in ARM 16.20.633.

(e) A 1 degree F maximum increase above naturally occurring water temperature is allowed within the range of 32 to 66 degrees F;

(f) No increases are allowed above naturally occurring concentrations of sediment...which are likely to create a nuisance or render the waters harmful, detrimental, or injurious to public health, recreation, safety, welfare, livestock, wild animals, birds, fish or other wildlife (ARM 16.20.633).

Lake Dams do affect stream flows for an undetermined distance downstream of their locations, but the small percentage of watershed area they control and the timing of releases minimizes downstream impacts.

Environmental Consequences

Introduction

This section describes potential water resource impacts from the various alternatives for the Canyon and Wyant Lake Dams rehabilitation project.

There are three alternatives assessed for potential effects. Alternative 1 is the required no-action alternative; 2 and 3 are action alternatives differing in the type of access. For the two action alternatives, several options (a, b, c, and d) have been developed to give the irrigation district flexibility in meeting its responsibilities and needs. For simplification, the various alternatives and options are generally discussed using the alternative number and option letter designation (e.g., Alternative 2.a refers to Alternative 2, Option a, and so forth).

Required Permits

The operations proposed by the Canyon Creek Irrigation District (CCID) will require several state and federal permits. Required permits include:

- CWA s404 permit for dredge and fill in waterbodies of US from the US Army Corp of Engineers (mandatory),
- 310 permit (Montana Natural Streambed and Land Preservation Act) for operations near a stream or wetland, from local Conservation District (mandatory),
- 318 authorization for unavoidable short-term water quality violation of turbidity standard, from MTDEQ (Highly recommended),
- Stormwater discharge permit from MTDEQ (Highly recommended).

All permit application work is the responsibility of the CCID as project proponent.

Sensitive Areas

No areas in the Canyon Creek watershed were determined to be especially sensitive to the proposed activities. The Affected Environment – Water Resources report describes the wilderness nature of the streams and wetlands, and with the exception of the dams themselves, how little management has occurred. Stream channels are very durable cobble and boulder types, with dense riparian vegetation and the ability to handle high energy flows.

One area that has relatively high sensitivity is the stream channel immediately below the Canyon Reservoir Dam outlet works. This reach, estimated at less than 100 yards in length, has a low-gradient, sinuous channel in a riparian meadow setting. It is a small, seasonally flooded wetland with fine sediment banks densely covered with sedge and other herbaceous plants. Due to its proximity to the dam, the channel may adjust to changes in flow from the outlet works or breach.

Mitigation Measures

Mitigation measures and terms and conditions are those controls or guidelines that allow activities to proceed with minimized environmental impacts. Chapter 2 in the EIS lists the mitigation measures proposed for the action alternatives. These required measures are designed to eliminate or minimize water resource effects from erosion, sedimentation, human waste, fuel handling and fuel storage. The predicted consequences of alternatives discussion (below) is based on implementation using the listed mitigation measures and terms and conditions.

Environmental Consequences

Three basic alternatives have been developed, based on different types of access. Alternative 1 is the “No Action” Alternative required by NEPA. Alternative 2 is the Proposed Action, which would rehabilitate or breach Canyon Lake dam and breach Wyant Lake dam and associated structures using helicopter access. Alternative 3 would rehabilitate or breach Canyon dam and breach Wyant Lake dam using a combination of helicopter and ground access. Each alternative will have specific water resource effects.

Alternative 1 – No Action:

This alternative would leave Wyant and Canyon Reservoir dams in their present condition. No construction activity would occur, and no ground disturbance would take place. Direct and indirect construction effects would be eliminated, as no work would be done in the watershed. No cumulative effects would be realized for the same reason.

This alternative would result in an increased dam safety problem over time. If the reservoirs were either still in operation or simply abandoned, the risk of a dam or outlet failure would increase, along with the threat to human safety and water resources in the analysis area. Dam failure would likely result in high flows, a possible flash flood, large sediment release from the reservoir, and extensive scouring throughout the canyon. Streamside riparian areas could be severely damaged or eroded away completely.

Alternative 2 – Proposed Action: Canyon Reservoir Dam – Option A, B, C, and D

This alternative would allow CCID to rehabilitate the Canyon Reservoir dam using helicopter access. A choice of construction methods would be available to the Canyon Creek Irrigation District (CCID) with this alternative.

No ground disturbance or water resource effects would result from the helicopter transport of equipment and personnel to the work site. The construction activities themselves would be the sole cause of any potential water resource effects.

Construction of the new outlet for Canyon Reservoir Dam would be accomplished by one of two available means. The method used in Alternative 2, Option A, includes boring a new outlet conduit through bedrock below the dam and rebuilding several parts of the embankment. Solid, un-fractured rock is a requirement of this approach, but whether this exists or not must be

determined with exploratory drilling. If appropriate rock is found, the boring will continue; if fractured rock is found, a “backup” method will be used. This method (Alternative 2, Option B) is called a “cut and cover” operation, with excavation of the dam embankment to the proper elevation (the “cut”), installation of an outlet pipe, and finally, the rebuilding of the dam embankment over the pipe (the “cover”). Under this option, the dam embankment would be enlarged and restructured to appropriate dimensions. Material for this operation would come from several rock outcroppings within and immediately adjacent to the reservoir, and would be treated by an on-site mobile rock crusher.

If the CCID determines that neither Option A nor B provides an economical outcome, then it may decide to breach the Canyon Reservoir Dam. This would be Option C, and would require heavy earthwork to remove dam materials to form an appropriately sized “breach” in the embankment.

Direct and Indirect Effects Common to Options A, B and D

Option A and B share several common activities and associated effects. Both alternatives include raising the dam crest, adjusting the spillway, and installation of new gate controls.

Alternative 2 (Option A, B and D) would include raising the dam crest to provide a consistent elevation across the top of the dam and building a hardened, auxiliary spillway. Fill for this operation would come from the reservoir bottom or from historic quarries near the normal high water mark. Work would occur during low pool conditions and would not disturb any erosion-prone areas above the usual waterline. The rock crusher would deposit some rock dust and fine materials around its location. Significant sediment transfer to the outlet is not expected due to the near zero-velocity condition within the reservoir pool, but a low level of suspended sediment is likely to be released during the construction period. The low velocities in the reservoir would allow most disturbed sediments to settle on the reservoir bed. Some sediment may be eroded off the dam crest and embankments during the construction activities. Rock armoring of the structure is proposed to protect the finer core materials from erosion. The mandatory erosion control plan and mitigation measures would also act to minimize sediment delivery to Canyon Creek. These improvements, when finished, would lower the risk of erosion to the downstream side of the dam during a severe storm or flow event, and also lower the risk of associated environmental effects. Mitigation measures also require building a cascading channel between the breach and the natural stream channel below, to disperse energy and reduce velocity. This measure would reduce erosion risk to the sedge meadow reach just below the outlet works on Canyon Dam.

Alternative 2 (Option A, B and C and D) would change the existing spillway. These changes would include raising the dam spillway less than 1 foot to its historic elevation and also increasing its flow capacity. This would include the placement and cement grouting of large rock. Any material needed would come from either the reservoir floor or historical quarries near the high water mark. Work would proceed during low pool and reservoir outflow would be diverted away from the bore site and pumped over the dam crest to avoid sediment impacts. This activity is not expected to leave any material on the reservoir floor or create sediment in the outlet stream. Water resource impacts from raising the dam spillway would be extremely limited

due to the diversion of water away from the worksite, use of rock from existing quarries or the dam itself, and the limited associated ground disturbance.

During work activities in the reservoir bottom or embankment, late-season in-flow will be diverted with a cofferdam built somewhat “upstream” of the outlet in the lake bottom, from where it will be pumped over or through the dam to the existing normal outflow channel. Sediment export to the stream would be limited by a synthetic lining of the cofferdam sump, preventing “vacuuming” of the reservoir bottom. The exploratory drill hole will be small in size (less than six inches in diameter) and will be in the general vicinity of the present outlet. Material removed during drilling will be left within the reservoir side of the dam to prevent its release into the outlet stream. The rock fragments from the drill core would add minimal fine sediment into the system, and due to the still water within the reservoir, little of this would be transported downstream. Total volume from the drill core would be less than 3 cubic yards of mostly coarse rock fragments (6” diameter x 100 feet of length). These rock fragments would not create negative environmental effects due to their coarse nature and lack of fine sediment.

New gate controls would be installed under Alternative 2, Options A, B and D. This is closely associated with the placement of the new outlet pipe and effects are included in that discussion for both alternatives.

Direct and Indirect Effects unique to Alternative 2 (Option A)

If this option is chosen, the boring would be conducted with appropriate equipment during the low pool period and after the site had been dried by lowering the water level. A new pipe would be grouted with cement to prevent leakage. Reservoir outflow would be diverted away from the bore site and pumped over the dam crest or spillway during the installation. Minimal flow would pass through the bore site or the adjacent work area. Rock removed from the new conduit would be mostly coarse particles with some finer sizes. This excavated material would be left within the reservoir below the high pool water surface elevation. Its fate would be similar to the rock removed during exploration drilling; it would be unlikely to move due to extremely low water velocities within the reservoir. Total volume would be less than 50 cubic yards (24” diameter x 100 feet of length) of mostly coarse rock fragments. No negative environmental effects are expected from the spreading of excavated rock on the reservoir floor. Excavation seepage and grouting wash water would be pumped and discharged at the reservoir shoreline for settling or filtration of sediment.

There would be minor earthwork in several small areas of the dam embankment to reinforce or replace weak, saturated fill material from the original structure. Source areas for material are discussed in the “Direct and Indirect Effects unique to Alternative 2, Option B,” section (below).

Direct and Indirect Effects unique to Alternative 2 (Option B)

If Option B is chosen, Canyon Lake Dam will be removed above the present outlet pipe to facilitate its replacement with a similar structure. The new pipe would be grouted in place with cement to prevent leakage. Excavation would be done with appropriate heavy equipment and excavated material would be stockpiled on the reservoir floor between the high and low pool

elevations. This would be reused to rebuild the part of the dam that had been removed to place to new outlet pipe. Heavy earthwork would be needed to widen the dam crest and build flatter embankment slopes. Extra material would come mainly from a proposed source along the south shoreline near the right abutment and a rocky outcropping near the dam within the high water mark. Additional source areas along the north shore below the high water mark may also be utilized. A mobile crusher would be located within approximately 500 feet of the existing embankment, and below the high water mark. The reservoir pool would be lowered to provide a stable operating site. Some rock from the excavation and crushing would end up on the reservoir floor. This leftover rock would be unlikely to move due to extremely low water velocities within the reservoir. No negative environmental effects are expected from the quarrying or excavated rock remaining on the reservoir floor. Reservoir outflow would be diverted away from the excavation sites and pumped over the dam crest or spillway. The excavation sites are rocky outcrops with little soil or fine material.

Overall, Alternative 2, Option B, would produce very little water resource impact. The State of Montana requires Best Management Practices and planned mitigation measures through its permitting processes. Keeping streamflow away from worksites with cofferdams has been an effective mitigation measure when replacing culverts, bridge supports, and other structures in standing water. The amount of sediment transported downstream would be extremely small, of very short duration, and environmentally insignificant in the context of the watershed characteristics described in the Existing Condition Report. In-channel increases in fine sediment would be limited to the reaches immediately below the dams. This effect is expected during construction and 1-2 years after the project is complete, until the sediments are dispersed.

Direct and Indirect Effects unique to the Canyon Reservoir Breach Option – Alternative 2, Option C

Alternative 2, Option C, consists of permanently breaching the Canyon Reservoir Dam to the appropriate dam safety standards (see Appendix A for discussion of breach requirements). This action would include the opening of a gap in the dam to lower the water surface to that near the former lake level. Engineering specifications for the breach (see Appendix A) must comply with existing dam safety regulations to prevent plugging of the new or enlarged spillway with debris and potential dam failure. A large amount of soil and weir rock (up to 800 cubic yards) would be removed and placed on the upstream slope of the dam. Removing material from the current dam structure and placing large, stable rock in the created opening would create an enlarged, armored spillway at an appropriate elevation. Materials needed for armoring the breach channel would come from the dam itself, with little extra quarrying needed. The existing gate, catwalk and gate stem would be removed. Leaving part of the dam in place to act as a weir would help retain reservoir sediment, as will the remaining pool or lake. Sediments currently stored in the reservoir are minimal due to the seasonal draining of the pool through the existing outlet works, and therefore any release of stored sediment is not predicted to produce substantial short or long-term effects. This would likely be the case whether the sediment retention weir was implemented or if the lake was allowed to return to its natural, pre-dam levels, but the weir was proposed to offer increased protection against a one-time sediment release that could affect fisheries or stream health. This lake is predicted to be approximately 12 surface acres, similar in size to the historic lake before Canyon Reservoir Dam was created.

Stream channel adjustment is likely to occur in two places. In the upper end of the reservoir, between the former low water line and the water line created by the new weir elevation, channel adjustment would likely transport some sediment. With the new water surface elevation being slightly higher than the former low pool surface elevation, the inlet stream would not need to cut a new channel through the historic reservoir bed, and sediment would be limited. The pool would recapture most of these natural sediments, but some suspended sediment would be transported out of Canyon Reservoir during spring high flows. Sediment leaving the reservoir will be quite limited. This is due to the efficiency of the lake in retaining sediments and in the natural low levels of sedimentation in the high mountain cirques of the Bitterroot Range. This process has the potential to last two to three flow seasons, until the new stream banks have adjusted and vegetated. The fine sediments exposed by the lower water levels have the potential to create and support high-quality alpine wetlands, similar to those created in abandoned beaver pond complexes. The second predicted channel adjustment is just below the Canyon Dam outlet. This wet-sedge meadow has a channel adjusted to the flow volumes issuing from the outlet pipe; flow from the spillway currently bypasses this reach. The alternative 2.C breach design would transfer flow from the existing spillway to the new breach and the meadow stream reach. Sedges have extensive fine root systems and are relatively resistant to high stream flows, but some channel adjustment and sediment production is expected in this reach. Within a short distance, the channel type changes again to a steeper, cobble channel, which is unlikely to suffer long-term degradation from this upstream adjustment. Duration of the effect would be for the high-flow season (May through June), for 2-3 years as the channel comes to a new equilibrium.

Direct and Indirect Effects unique to Alternative 2, Option D

This option combines some of the activities in options B (excavate to the outlet works, replace the outlet works, and rebuild the overlying dam) and C (fully breach Canyon Dam and build a new spillway at the old outlet location to handle the probable maximum flood). It would be broken into 2 phases (breach in 2003, rebuild new outlet structure and dam in 2004) to address current safety concerns as soon as possible. Differences would lie in the elevation of the breach and resulting spillway, and in breaking the project into 2 work seasons. Also, the potential addition of a geotextile liner cloth to the upstream or “wet” side of the dam is included in the proposal. This liner would reduce saturation of the earthen dam, increasing its strength and stability. Materials needed for armoring the breach channel would come from the dam itself, with little extra quarrying needed.

Effects of this option would be similar to those discussed for option 2.B, with some exceptions. These exceptions include:

1. A breach elevation would be chosen to create a small reservoir (estimated at about 100 acre feet of useable storage above the minimum pool level), rather than stabilizing the lake level at the lower full breach elevation. This would result in a smaller water level fluctuation for the following season as the reservoir is filled and drained. This would be temporary and last approximately 1-2 irrigation seasons. Wetlands around the lake perimeter are minimal due to the past seasonal fluctuations of water, and no significant wetland losses are expected.

2. The site around the outlet works and proposed temporary breach would be disturbed twice, once for excavating and building the temporary breach channel, and once again for excavating and building the new outlet works, dam section, and possibly, the geotextile liner. This would increase the potential for sediment to be moved into the stream during rainstorms from one operating season to two. The actual effects are dependent on having intense rainstorms while the project area is in a disturbed or unfinished condition. With erosion control plans being implemented during both phases, the change in potential sediment is small, and no long-term water resource impacts are predicted. The material excavated for the breach would be re-used to build the final dam structure after the new outlet works is installed.
3. A hand crew may replace heavy machinery in the first phase of this proposal (creation of the temporary breach at the outlet works). This would reduce impacts from the use of heavy tracked equipment around the site. Differences to water resources would not be great, however, as the use of a tracked excavator within the reservoir water line is not expected to create substantial amounts of sediment or impact downstream.
4. The geotextile liner project would entail the creation of a suitable bed for the liner, placing the liner, and then installing a protective earthen layer over the liner to prevent damage. A gravel crusher would be used to prepare a suitable material for the liner bed and cover, and rock would be quarried from below the reservoir high water line as noted above. Effects from this part of the operation would be similar to that described in 2.b, above. CCID may also utilize lake-bottom sediments in building the bed or cover for the liner. This would be collected from between the low and high water lines during the late summer work period (low water). An s404 permit would be needed from the Army Corp of Engineers for this work, which would require a mitigation plan and consideration of environmental impacts during the application process.
5. Channel adjustment in the wet meadow reach below Canyon Dam would be limited to the high flow period for the year before the time the outlet works and dam are rebuilt (predicted to be in 2004). If this were delayed, channel adjustment would occur for up to 2-3 years, until a new equilibrium is reached.
6. No changes to water resources would occur from the difference in helicopter flights.

Wyant Reservoir Dam

Alternative 1 – No Action

This alternative would leave Wyant and Canyon Reservoir dams in their present condition. No construction activity would occur, and no ground disturbance would take place. Direct and indirect construction effects would be eliminated, as no work would be done in the watershed. No cumulative effects would be realized for the same reason.

This alternative would result in an increased dam safety problem over time. If the reservoirs were either still in operation or simply abandoned, the risk of a dam or outlet failure would increase, along with the threat to human safety and water resources in the analysis area. Dam failure would likely result in high flows, a possible flash flood, large sediment release from the reservoir, and extensive scouring throughout the canyon. Streamside riparian areas could be severely damaged or eroded away completely.

Direct and Indirect Effects of Alternative 2 (Options A through D)

All alternatives and options except the No-Action alternative propose a partial breaching this smaller dam at Wyant Lake upstream of Canyon Reservoir to appropriate dam safety standards (refer to Appendix A for discussion of dam safety requirements for breaching Wyant Lake Dam). This action would include the construction of a hardened opening in the dam to lower the water surface to an appropriate level. Engineering specifications for the breach (please see the engineering report for this project) must comply with existing dam safety regulations. An unspecified amount of embankment materials would be removed from a chosen breach location and placed on the upstream slope of the remaining dam. Removing this material and grouting large, stable rock in the new opening would create an enlarged spillway somewhere below its present elevation. The existing gate catwalk and gate stem would be removed, and the existing gate would be blocked open. Flow may occur in the present outlet, the breach, and the modified spillway, all in existing channels. Since the former outlet structure would not be maintained, there is a chance of this plugging over time. In this case all outflow would pass through the new spillway and breach opening. This situation is planned for in the breach design and will not reduce the safety level or change environmental impacts. Leaving part of the weir or dam in place would retain reservoir sediment.

Stream channel adjustment in the upper end of the reservoir, between the former low water line and the water line created by the new weir elevation, would likely transport some sediment. The remaining pool may recapture these natural sediments, but some sediment would be transported out of Wyant Reservoir during spring flows. Sediment leaving the reservoir will likely be quite limited due to the trapping effect of the remaining pool, reducing effects to the stream reach between the two reservoirs. This process has the potential to last two to three flow seasons, until the exposed sediments have adjusted and vegetated. The fine sediments exposed by the lowering of the water level have the potential to create and support high-quality alpine wetlands, similar to those created in beaver pond complexes.

No channel adjustment is expected for the outlet stream, since water will be routed through the existing pathways in the spillway and outlet pipe. No increase in flow would be seen in either channel with the proposed design.

Direct and Indirect Effects unique to Alternative 3 – Mixed Access (Applies to both Canyon and Wyant Reservoir Dams)

This alternative would use both helicopter and surface access. Motorized equipment and some supplies too heavy for pack stock would be flown in, but horse and foot transport would be used when possible. The trail below Canyon Reservoir would be improved to accommodate the pack stock safely, and a trail between Canyon and Wyant Reservoirs would be constructed for the same reason. Afterwards, the trail between Canyon and Wyant Reservoirs would be left for public use.

All construction activity on the two dams would be identical to Alternative 2. Alternative 3 would differ only in access. The “A”, “B”, “C” and “D” Options would still apply. Please see the discussion for Alternative 2 and its options for effects from these specific actions.

Trail construction effects would be associated with the improvement of the trail tread below Canyon Reservoir and the ¼ mile of new trail built between Canyon and Wyant Reservoirs. Very little impact is expected from the construction or reconstruction of this foot/stock trail. The existing trail has one small tributary stream crossing (stream width is approximately 1 foot at this crossing) and also runs through a spring/seep area for about 15-20 feet. A small amount of sediment may be contributed to water bodies or wetlands through these points, during construction and use (from 2 to 5 years). The time for completion would be longer than under Alternative 2 due to the trail construction work.

Wetlands

The proposed action alternatives would disturb small areas around the dams, outlet channels, and trail. Wetlands associated with the reservoir water lines, the stream channel between Wyant and Canyon Reservoirs, the Canyon Dam outlet, and within approximately 10-15 feet of the access trail need to be considered. The proposed management would not threaten other wetlands elsewhere in the watershed due to the distances involved and minor flow and sediment effects.

Changes in Canyon and Wyant Reservoir and dam operation may have some minor effects on wetlands associated with the reservoir pools. Traditionally, wetlands associated with reservoir water lines are limited in area and diversity by the seasonal changes in water surface elevation. The late summer draw-down generally leaves wetland vegetation perched too far above the water table to survive, although some plants will persist. Raising the spillway on Canyon Reservoir Dam may raise the high pool waterline up to a foot. This, in turn, may submerge some small seasonal wetland areas that have formed along the former high waterline. Loss of these wetlands would be counterbalanced by creation of new wetlands along the new high water line, although they may take several seasons to form.

If Wyant Reservoir Dam is breached, then wetlands may also be redistributed around this site. The lowering of the pool surface elevation from the former level may leave some small wetland areas without the water they need to survive. However, the breach process will likely lead to increased wetlands in the vicinity of the former reservoir pool due to the creation of wetland-compatible sites. Fine lake-bottom sediments along the inlet channels to the pool may foster the growth of wetlands, depending on the final soil-water characteristics. More importantly, the constant level of the pool remaining after the breach process will provide a more dependable water supply to wetland plants that establish themselves along the new shoreline. The likely results of breaching either dam and stabilizing its water surface elevation is to create and support more wetland area with higher diversity than existed before the action.

Wetlands along Canyon Creek below the Canyon Dam outlet may be affected by the change in flows as discussed above for Alternates 2, Option C and D (the “breach alternatives”). Some loss of sedge meadow may occur if the channel widens and adjusts to increased flows below the

proposed breach. This would be partially mitigated by building a cascade or step-pool channel between the breach and the wet meadow to reduce water velocity and erosive capability.

Streamside wetlands farther below the dam would not be threatened. Seasonal variation in stream flows would still exist to provide water to streamside riparian zones and hydrophilic vegetation.

Trail building associated with Alternative 3 would have little affect on wetlands. If the trail is upgraded to a higher standard than present, the widening process is likely to encroach slightly on wetland plants along the above-noted tributary crossing and the boggy spring/seep areas. This widening would be limited to an increase of 2-3 feet; this change would be insignificant at a site-specific or watershed context. Disturbance or sediment from the trail construction/reconstruction activity would have little chance of affecting wetlands along Canyon Creek. Only the trail at the small stream crossing lacks a vegetated buffer between it and flowing water to catch and stabilize soil lost off the trail surface. This small sediment contribution would have no significant effect on wetlands along the stream margins. Some livestock trampling of wetland plants around the one stream crossing and the boggy seep/spring area would be expected during the dam rehabilitation period. This would result in a slight increase in wetland effects above that from trail construction, but due to the extremely small area involved (less than 100 feet in length), it would have a negligible effect except at an extremely small scale.

Any trail obliteration or rehabilitation that followed completion of the dam rehabilitation would have similar minimal impact on wetlands or water quality as trail construction/reconstruction, for the same reasons.

Alternative 1 (the No Action Alternative) would not threaten any existing wetlands, unless a dam failure causes channel and streambank scouring. Reservoir operation would stay as it has been and preserve the status quo for wetlands in the analysis area. Risk of flash flood damage to streamside wetlands would increase over time with this alternative.

Floodplains

Action alternatives proposing rebuilding the dam may fill a small area of floodplain immediately below the dam. This area would be too small (estimated at 5-10 square yards) to affect downstream flood peaks. Some floodplain or streambank may be lost during channel adjustment below the Canyon Lake outlet if the dam is breached for a long enough period to cause this effect. This is also a very limited area and no downstream effect on flood peaks is expected. None of the alternatives would significantly modify floodplains downstream along Canyon Creek. However, Alternatives 2 and 3 would reduce the risk of catastrophic flooding from dam failure while retaining present flow regimes. Alternative 1 (No Action) would preserve the status quo, which is an increasing risk of a catastrophic event over time if the present operating plan is followed.

Cumulative Effects

The Canyon Creek watershed characteristics are described in the Affected Environment – Water Resources Report for the Canyon – Wyant Reservoirs Dam Rehabilitation Project. The

watershed boundary for Canyon Creek defines the cumulative impacts analysis area. The upper watershed is within the Selway-Bitterroot Wilderness and has experienced little human disturbance other than dam construction and maintenance. The reservoirs were constructed without substantial mechanized equipment. The effects of the original construction (mainly sediment from quarry sites and ground disturbance) have likely subsided to the point of non-existence, or were mitigated by storage in the reservoir pools. Reservoir and dam operations since that time have included the filling and draining of the pool, clearing of driftwood and occasional maintenance of the spillway and dam crest. Seasonal draining would change flow and sediment regimes somewhat from those existing before the dam. Flow regimes are discussed in the hydrology Existing Condition section. Sediment would tend to be transported as the reservoir reached its low pool in the fall, rather than during spring high flows. Consistent seasonal draining has prevented a large build-up or release of sediment and mitigated this effect of dam operations. Effects from maintenance and operation have been minimal, as evidenced by site conditions around the dam and good water quality in the creek. This maintenance is expected to continue in the future if Alternative 2 or 3 is chosen, with similar limited environmental effects. The Canyon Creek Irrigation District Technical Narrative for the dam rehabilitation project notes that the dam has been overtopped several times in its life span, with the most recent event in 1996. These events eroded parts of the dam and contributed sediments to Canyon Creek during high flows. Canyon Creek is a durable channel and has high sediment transport capability within the canyon; present day channel condition and water quality on the Bitterroot National Forest suggest that the local impacts from these events and activities have been either very small in magnitude or quite short in duration.

On private lands below the forest, development and irrigation diversion have created various impacts. While some flow from Canyon Creek is diverted for agricultural use, it generally maintains its hydrologic connection with the Bitterroot River throughout the year. Proposed alternatives and options that include breaching would provide for more natural flow regimes for the life of the breach. Those options that include dam reconstruction would maintain the status quo for flow regimes.

Canyon Creek has not been identified as a water quality-limited stream on the MTDEQ 303(d) list, which suggests that the present level of cumulative impacts is not limiting beneficial uses. It also suggests that Canyon Creek is not a major sediment contributor to the Bitterroot River. Only one developed road-crossing (the paved West Side Road) shows up on local and Forest maps, limiting sediment from road sources. Some sediment is likely from private home building, but the number of sites under construction that have hydrological connected disturbed areas at this time is unknown. The streamside areas along Canyon Creek below the Forest boundary are mostly in developed mixed rural and residential status and tend to be well vegetated, reducing potential sediment inputs.

To summarize cumulative effects, the action alternatives (Alternatives 2 and 3, with all options) have a small potential to produce sediment in Canyon Creek. Most of this potential can be eliminated through the mitigation measures (please see the Consequences of Alternatives discussions above), but a small potential for sediment production remains. This remaining risk is mainly associated with extremely large storm events during construction, which is very unlikely during the late summer construction period. This work period was chosen, in part, to reduce the

probability of this and other potential water resource impacts. Extending construction periods over several seasons for the action alternatives would increase the potential for water resource impacts. Trail construction/reconstruction (Alternative 3 only, including options) has the potential to contribute very small amounts of sediment in one tributary side channel. With very little existing human impact in the upper watershed, and little possibility of substantial effects from this project, loss of beneficial uses, water quality, or channel damage in Canyon Creek are unlikely to occur. On a smaller scale, activities may affect water resources as noted above in the effects discussions for each alternative. The probability of these small-scale impacts pushing cumulative effects in the watershed to any noticeable level is quite low.

Forest Plan Consistency

For both Canyon and Wyant Lake Dams, Alternatives 1, 2 and 3, implemented with the listed mitigation measures, would be fully consistent with the 1987 Bitterroot Forest Plan Standards and Guidelines (listed above). All other pertinent regulations pertinent to water resources would also be met, as long as proper permitting processes are followed.

Summary

For water resources, there is no substantial difference between Alternative 2 (Option A, B, C, and D) and Alternative 3 (Option A, B, C, and D). Dam rehabilitation or breaching effects would be the same for either type of access, and the trail impacts are negligible on both site and watershed scales. Water resource effects from either of these two alternatives (and the options contained therein) can be mitigated to minor levels. Mitigation measures would reduce the risk of construction impacts to negligible levels and address the few water resource issues that were brought up during NEPA scoping. Alternative 1 (No Action) has no work-related impacts but allows the substantial threat of dam failure to remain.

BIOLOGICAL ENVIRONMENT

FISHERIES

Existing Condition/Affected Environment

The analysis area for this project for fisheries includes the Canyon Creek drainage³. Canyon Creek is a perennial tributary to the Bitterroot River. Unlike many of the other tributaries to the Bitterroot River, it is not dewatered between the mouth of the stream and the Forest boundary (Chris Clancy, Montana Department of Fish, Wildlife and Parks, pers. Comm. 2001). The 10 square mile watershed has limited activities occurring in it on the Forest because of the steep terrain and the Wilderness designation in the upper 3.5 miles of the watershed. The primary disturbances on the Forest are: an irrigation water diversion near the Forest boundary (which takes about 5% of the mid-summer stream flow), a parking area at the trailhead, and small disturbed areas along trail #525 where people habitually use the streamside area. There are no obvious affects to fisheries or aquatic habitat from the disturbance created during the

³ NRCS Hydrologic Unit Code 170102051004.

construction of the dams. The dam and maintenance of it, do not appear to be resulting in channel instability or degraded aquatic habitat (USDA Forest Service 2001). The lower 3.5 miles of the approximately 9 mile-long stream is privately owned, and this portion of the watershed has been used for timber harvest and developed for home sites.

The project area is located near the headwaters of the sub-basin. Canyon Lake is upstream of a steep and tall bedrock chute, and it is eight miles upstream of the Bitterroot River. Wyant Lake is about ¼ mile upstream of Canyon Lake.

Canyon Creek is a steep stream consisting of high gradient riffles interspersed with pools formed by lots of large woody debris and scour around boulders. Late June discharge was approximately 20 cubic feet per second (cfs) near the Forest boundary in 2001. The substrate is primarily gravel and cobble. The width and depth of the stream are within the range observed in unaltered streams in the Bitterroot watershed. Temperatures were collected at two points with remote recorders in 2001. Daily maximum temperature in the stream near the Wilderness boundary reached 60° F on two occasions. The maximum 7-day moving average (used in INFISH 1995) was 59° F. Below the falls daily maximum temperature in the stream reached 64° F on five occasions. The maximum 7-day moving average was 63° F.

The only native trout (salmonids) observed in the drainage was the westslope cutthroat trout (*Oncorhynchus clarki lewisi*). The westslope cutthroat trout a sensitive species on the Bitterroot National Forest. Westslope cutthroat trout are common in Canyon Creek from the mouth (at the Bitterroot River) to the talus and bedrock falls downstream of Canyon Lake (Forest Service snorkeling surveys: 1994, 1995, 1998, and 2001). Cutthroat trout are also present upstream of the talus and bedrock falls, to the base of the dam, and in Canyon Lake. The fish in this uppermost section are probably escapees from the reservoir. Preliminary genetic analysis of cutthroat trout caught on the Forest was that this population is genetically pure westslope cutthroat trout. The population is also likely to be pure above the Forest boundary (Montana Fish, Wildlife and Parks 2000). However, prior to the historical fish stocking, the lake and the stream above the bedrock chute was probably fishless. Yellowstone cutthroat trout were stocked in the lake in the 1950's. and 1960's. Westslope cutthroat trout have been stocked since 1977 and were last stocked in Canyon Lake in 1990. Several age-classes of trout are in the lake, indicating that the lake population is self-sustaining. A 2002 survey identified two spawning locations of the lake-dwelling cutthroat trout: one is the primary inlet stream (from Wyant Lake), and the other is the outlet of Canyon Lake which goes dry before the eggs can hatch. The lake-dwelling cutthroat trout spawn in early July. Wyant Lake is fishless because it has no water in it during the late summer and fall.

Bull trout (*Salvelinus confluentus*), have not been observed in the drainage, and are thought to be absent. The reason for their absence is not clear, but it could be related to stream size, temperature, or other factors. Bull trout are present in the Bitterroot tributaries that lie immediately north (Blodgett Creek) and south (Sawtooth Creek) of Canyon Creek. Canyon Creek is distinctly smaller than Blodgett and Sawtooth creeks, and bull trout typically inhabit the larger streams in the Bitterroot sub-watershed. In contrast, cutthroat trout are common in large and small streams. Water temperatures often correlate with the presence of bull trout.

Temperatures in Canyon Creek appear to reach levels that may restrict bull trout activity, but the temperatures alone do not appear to explain the absence of bull trout.

Brook trout (*Salvelinus fontinalis*), an exotic species, are abundant in lower Canyon Creek. Brown trout (*Salmo trutta*) have been occasionally observed in lower Canyon Creek. Elevated water temperatures near the mouth of the stream have probably made this section of the stream uninhabitable for bull trout and increased the amount of habitat occupied by non-native brook trout. Brook and brown trout have a competitive advantage in streams with warmer temperatures. The loss of riparian shade and water diversions increases water temperatures of the stream.

Regulatory Framework

Bull trout are protected as a threatened species, under the Endangered Species Act. Critical habitat is being proposed at this time for bull trout in the Columbia River basin. The existing Federal listing, and the critical habitat designation if finalized, requires Federal agencies to review their activities to ensure they are not likely to jeopardize the continued existence of listed species or adversely modify a protected species' critical habitat. A biological assessment (BA) is used to evaluate potential effects of this project on bull trout within the Columbia River distinct population segment. The USDA Forest Service policy (FSM 2672.4) requires a biological evaluation (BE) to be completed to review activities in sufficient detail to determine how proposed action may affect sensitive species, such as westslope cutthroat trout. A BE and BA has been completed and was reviewed by the U. S. Fish and Wildlife Service. The U. S. Fish and Wildlife Service concurred with the determination of may affect, not likely to adversely affect bull trout and of no effect on proposed critical habitat.

Resource standards in the Forest Plan (USDA Forest Service 1987) state that cutthroat trout populations will be used as an indicator of fisheries habitat changes (II-20(7)); watershed project analysis will estimate the effects of sediment on fish habitat (II-20(8)); and that habitat needs of sensitive species will be considered in all project planning (II-20(16)). For projects in riparian areas (Management Area 3b) stream channel equilibrium and downstream fish habitat will be maintained (III-23(3)). The Forest Plan was amended by INFISH (1995). INFISH directs that projects should not retard the attainment of riparian management objectives (RMOs). The RMOs are set for water temperature (below 59° F for adult holding habitat and below 48° F in spawning and rearing habitats), pool frequency, large woody debris (greater than 20 pieces per mile) and width-depth ratio (less than 10).

Environmental Consequences

Introduction

This section describes potential impacts to the aquatic habitat and fish populations from the No Action Alternative, two action alternatives and four options that are considered within each action alternative.

Issues Related to Fisheries

This analyses, and the BE and BA consider the effect of No Action and the options on several fish population and habitat indicators. A few of these indicators have the potential to be affected and they are addressed below.

Fine sediment transport and accumulation

Fine sediment in streams can adversely affect trout by clogging gravels used as redds (nests). The redds need to have water flowing through them to keep eggs and developing larvae alive. Fine sediment can also fill pools and other spaces used by trout during various seasons (Hicks, et al. 1991; Castro and Reckendorf 1995). Fine sediments are likely to be suspended in the water column and redistributed downstream during construction activities. The magnitude of the effect would be limited by the mitigation measures implemented, as discussed below (and in Chapter 2).

In streams, sediments and organic debris travel downstream. Organic debris provides the basis for the biological productivity of a stream (Marcus et al. 1990). Reservoirs accumulate sediment and nutrients that would normally pass downstream and can change the productivity downstream of dams (Vannote 1980). This effect is minor in Canyon and Wyant reservoirs because of the scoured granitic nature of their watershed, and because the dams are high in the watershed.

Water temperature

Cool water temperatures are strongly correlated with native trout in western Montana, and warmer streams usually have non-native trout species present. The relatively shallow Canyon and Wyant reservoirs are believed to slightly increase water temperatures. This effect is a difference of a few degrees. (see p 3.37 for discussion regarding temperatures).

Spawning habitat for trout in Canyon Lake

Westslope cutthroat trout were last stocked in Canyon Lake in 1990. Spawning has been observed in the tributary that flows from Wyant to Canyon Lake, and in the primary spillway of Canyon Lake. It is also possible that some spawning occurs in the outlet of Canyon Lake, but it is not known if the fish in the outlet could return to the lake through the outlet (Watkins 2002). As evidenced by the assortment of age classes in the lake, the fish successfully reproduce at one or more sites.

Water rights are controlled by the State of Montana. The water storage and flow control of Canyon and Wyant Reservoirs are beyond the scope of this analysis and decision.

Direct and Indirect Effects of Alternatives

Two action alternatives with three options in each have been developed. The alternatives and options are compared below.

Effects of Alternative 1 – No Action

This alternative would result in an increased risk of dam failure. Dam failure would likely result in high flows, a large sediment release from the dam and reservoir, and extensive scouring throughout the canyon. This would kill fish and other aquatic animals, and severely degrade aquatic habitat in Canyon Creek. Recovery time for the habitat and aquatic biota would be more than a decade. Canyon Lake also provides a recreational fishery. A failure of Canyon Lake dam (without dam reconstruction) would reduce, but not eliminate the recreational fishery in the lake.

Failure of Wyant dam would impact the Canyon Lake recreational fishery by partially filling the Canyon Lake reservoir with sediment. To a lesser degree, No Action could impact the fishery below Canyon Lake because it would probably not retain all the fine sediment released during a Wyant Dam failure. The stream and aquatic habitat between the two reservoirs would also be degraded in the event of a Wyant Dam failure.

Effects of Alternative 2

Canyon Lake Dam

Option A and B would rehabilitate the Canyon Reservoir dam using heavy equipment transported by helicopter. Very minor ground disturbance (disturbance at a landing area) and water resource effects are expected to result from the helicopter transport of equipment and personnel to the work site. The risk of fuel spills would exist.

Options A and B options include:

- Raising the dam crest and adjusting the spillway,
- Installing a new outlet structure (conduit pipe and gate controls),
- Breaching Wyant Reservoir.

Raising the dam crest would provide a consistent elevation across the top of the dam. A hardened, auxiliary spillway would also protect the structure from failure. Fill for the dam crest would come from the reservoir bottom or from historic quarries near the normal high water mark. Work would occur during low pool conditions and would not disturb erosion-prone areas above the usual waterline. Where possible, sediment-laden water in work areas would be pumped and discharged at the reservoir shoreline for settling or filtration of sediment. This would reduce the amount of sediment expected to reach the stream below the outlet.

Some sediment may be eroded off the dam crest during the construction activities. The area immediately above the outlet stream would produce small amounts of sediment that would reach Canyon Creek. Material from any other area of the dam crest would be filtered by vegetation along the bottom of the dam before reaching the stream, substantially limiting the volume of sediment that would reach the stream. The dam crest is flat and would not be easily eroded by rain. These factors would result in minor amounts of sediment reaching the stream. Sediment traps constructed with silt fence straw bales, or other proven devices, would further reduce the potential amount of fine sediment that could reach the stream. It is realized that the spillway and

rocky areas may not be conducive to sediment traps because the water may flow through boulders and may carry some sediment to the stream.

Dam reconstruction would lower the risk of erosion to the dam during a severe storm and lower the risk of dam failure described in the No Action scenario above.

The trout in the lake are important as a self-sustaining recreational fishery, but are not a natural component of the lakes ecosystem. These previously stocked cutthroat trout in the lake spawn in the spillway, but the spillway dries each summer, usually by mid August (Ren Cleveland, pers. comm. July 10, 2002). Therefore, the fish that spawn in the spillway are not successfully reproducing, and changing the spillway will not alter the survival of these spawning fish. It is suspected that the successful reproduction of fish in the lake is occurring in the inlet stream, which comes from Wyant Lake. Construction at Canyon Dam, including re-establishing the historical the level of the lake by less than one foot is not expected to affect this spawning area.

Construction of the new outlet for Canyon Reservoir Dam would be accomplished by one of two means. Option A (boring a new outlet conduit would create minimal amounts of fine sediment and turbidity. The total volume of the bored material would be less than 50 cubic yards (24" diameter x 100 feet of length). Work at the reservoir outlet would take place after the water level had been sufficiently lowered to dry the work site. Water entering the reservoir would be diverted with a cofferdam built just "upstream" of the outlet in the lake bottom, from there it would be pumped over or through the dam to the normal outflow channel. Seepage into the work area would be pumped and discharged at the reservoir shoreline for settling of sediment. The boring procedures are expected to have negligible affect on downstream fisheries and aquatic habitats.

Option B includes substantially more excavation and placement of fill, but Option B would reduce the need for more reconstruction work in the future. The proposal includes the replacement of the outlet conduit and 1000 cubic yards of material to rebuild the dam. The material needed would come from either the reservoir floor or historical quarries near the high water mark. Water would be handled the same way as planned in the boring operation. Fish in the reservoir and downstream in Canyon Creek would experience temporary increases in turbidity and minor amounts of fine sediment deposition. The effects would be greatest in the reservoir and substantially less downstream. The reservoir has a slow rate of water movement through it, so most of the sediment that settles and highest concentration of suspended sediment would be in the reservoir. Turbidity may affect feeding behavior and indirectly growth of fishes. The sediments are not expected to be of the magnitude that would cause direct or indirect fish mortality.

Option C, breaching both dams using heavy equipment would have similar, but less impact than the Option B. The amount of new material needed for Option B creates more risk of fuel spill and longer duration of construction related sediment redistribution. No ground disturbance or water resource effects are expected to result from the helicopter transport of equipment and personnel to the work site. The risk of fuel spills would exist.

Option C includes:

- Removing dam materials near the existing spillway at Wyant, and near the outlet conduit for Canyon dam,
- Reconstruction of the stream channel in the breach area of Canyon Dam. The reconstructed portion of the stream would be a steep cascade or a set of small falls and plunge pools (Rosgen A2 channel type; Rosgen 1996) because it is expected to have a slope of approximately ten percent for its approximate 60-foot length.
- A Forest fisheries biologist and hydrologist would be notified when the stream reconstruction phase of the project would begin so they have the opportunity to be onsite if they determine it is necessary.

Waste material from the dam would be placed in the reservoir bed in an area where it would not impact the flood plain. Work would occur during low pool conditions and not disturb erosion-prone areas above the full-pool waterline. A cofferdam would be used to keep the work zone as dry as possible. Water leaking through the cofferdam would be pumped and discharged at the reservoir shoreline for settling or filtration of sediment. This sediment would not be expected to reach the outlet due to the lack of flow within the reservoir. Most suspended sediment would settle and remain on the reservoir bed. Water entering the reservoir area would be pumped over the dam and into the existing spillway channel.

Effects resulting from Options B and C are likely to last a few years. The biggest pulse of sediment is likely during construction activities and even this pulse of sediment is likely to be small. Over the next few years some soils may erode from the site and settle downstream. This effect to the stream is expected to be negligible. The breaching would be an improvement relative to the current situation (and the No Action Alternative) because it would eliminate the risk of dam failure.

An indirect effect of breaching Canyon Dam is the return of historical flow regimes. This is likely to benefit the endemic aquatic resources (endemic fisheries, aquatic insects, riparian associated plants and animals) because the native species are adapted to the range and timing of historical flow levels.

Option D:

The natural lake storage capacity is approximately 100 acre-feet, which would remain regardless of the presence of the dam. The partial breach would maintain an estimated 100 acre-feet of usable storage, in addition to the 100 acre-feet storage of the natural lake, which results in a total of 200 acre-feet of storage capacity at Canyon Dam after the partial breach is completed. The partial and temporary breach will function as the principal spillway. The spillway runs water during the spring and early summer snowmelt period. Therefore, channel stabilization and grade control will be necessary to safely conduct water through the breach and to reduce the potential for erosion from side slopes of the dam embankment and stream banks immediately downstream of this “new” spillway.

The proposal includes key steps that are evaluated in detail. The steps are:

- Partially breaching the Canyon Dam (phase 1),

- Raising the dam crest and spillway (phase 2),
- Installing a new outlet structure (conduit pipe and gate controls),
- Breaching Wyant Reservoir.

The short-term breach of the dam would begin in July 2003. The proposed hand labor could begin while the dam is relatively full without impacting the site.

During construction, water and sediment management would be the same as required in options A and B. For example, heavy equipment construction activities occurring within the reservoir area would occur during low pool and a cofferdam immediately upstream of the worksite would be used to keep the work zone as dry as possible. The amount of erosion and sedimentation resulting from construction would also be similar to option B. A difference in the effect of this option results from the spillway being temporarily moved to a point above the conduit outlet. Adjustment of the stream channel, especially in the meadow section approximately 50 feet downstream of the dam, is likely. The range in channel adjustment depends on the amount of water that would flow through the spillway during the time it is in use. The effect could range from no detectable channel adjustment to extensive bank erosion with some down cutting. The more substantial changes in this section of the stream could occur as a result of an exceptional runoff event. The risk of this occurring is limited by the rocky stratum that is 18-24 inches below the current channel bottom (M. Oelrich, Hydrometrics Inc., pers. comm. March 2003), the wide floodplain in this section of stream, and the robust riparian vegetation that is present at the site. Erosion of the meadow area could result in a widening of the existing channel and a flush of sediment downstream. The impact would be reduced, but not eliminated by the mitigation measure that requires strategic placement of boulders to form a series of plunge-pools and cascades within the partial breach to dissipate the water's energy. The area downstream of the meadow is dominated by boulders and bedrock and not prone to erosion. The existing spillway meets the existing outlet channel about 200 yards below the dam. The channel from this point downstream would not experience a change in water volume (erosive power) after the proposal is implemented. Immediately above the falls and downstream of the meadow section is a small ponded area which was East Lake prior to it being breached. The date of this breach is not known, but it occurred long enough ago that vegetation has grown around it. Material eroded from the meadow area, should the channel adjustments be substantial, would likely accumulate, and be most notable in the former East Lake area.

Wyant Lake Dam

All options include breaching Wyant dam, which would decrease the size of the fish-less and seasonal reservoir. Removing material from the current dam structure and grouting large, stable rock in the created opening would create an enlarged spillway below its present elevation. The existing gate at the outlet would be blocked open. No new channel would be created. Leaving part of the dam in place would retain some reservoir sediment.

The inlet stream would cut a new path through the deposited sediments of the reservoir bed. The stream channel adjustment process has the potential to be the greatest in the first two to three years following the breach, until the new stream banks in Wyant reservoir have adjusted and vegetated. Some sediment is likely to leave the Wyant Reservoir bed.

The outlet stream on Wyant Lake becomes a tributary of Canyon Lake. This tributary appears to be the primary spawning location for Canyon Lake's introduced cutthroat trout population. Sediment carried into this spawning site may impact the Canyon Lake trout population for several years. It is likely that as the sediments in the Wyant Reservoir become stable (vegetated) the fine sediment levels in the Canyon Lake inlet stream would begin to revert to its pre-project spawning capacity. This may take five to ten years.

Canyon Lake would act as a sediment trap and there would be no effect of the Wyant dam breaching to the stream below Canyon Lake.

The marshy area below the Wyant dam outlet is likely to dry as a result of the outlet structure becoming a secondary drain for the reservoir, and the breach at the spillway becoming the primary drain. Although the outlet would be blocked open, it would no longer be maintained and would plug over time. Another cause of the drying would be that the reservoir would no longer leak through the dam as it has in the past. The effect is likely to be a change from a marsh habitat type to a drier and narrower riparian habitat type, and possibly an upland habitat type if the outlet becomes totally plugged. The negative effect to this marsh habitat would be offset by the creation of similar habitat upstream of the breached dam. The reservoir area would not have the drastic annual fill and drain occurrence. Therefore, riparian vegetation would establish in the existing reservoir bottom, which is currently a mudflat.

Cumulative Effects

The upper watershed of Canyon Creek is within the Selway-Bitterroot Wilderness and has experienced little human disturbance other than dam construction, dam operations and maintenance, trail maintenance, and dispersed camping. Dam operations and maintenance have included the clearing of driftwood, opening and closing the gate to control water storage and release, and occasional maintenance of the spillway and dam crest. The reservoir has over-topped the dam several times in its life span, with the most recent event in 1996. These events have eroded parts of the dam and contributed sediments to Canyon Creek during high flows. Observation of habitat and populations do not indicate that these events have had long-lasting or substantial effects on the fisheries or aquatic habitat.

Canyon Creek is not a major sediment contributor to the Bitterroot River. Only one developed road crossing (the paved West Side Road) is known, limiting sediment from this type of source. The streamside areas along Canyon Creek below the Forest boundary experience a mix of rural and residential activities, but tend to be well vegetated, which reduces potential sediment inputs.

Limited amounts of water reach the Bitterroot River during the summer months when irrigation demand is high. This may limit the movement of fishes between the river and Canyon Creek.

To summarize cumulative effects, the options are unlikely to transport measurable amounts of fine sediment to a substantial portion of Canyon Creek. The increases in fine sediments would have negligible impact on fish and aquatic habitat. The potential for negative impacts would be limited with the implementation of the mitigation measures. Risk of more sediment input than is

discussed is possible, and this risk is mainly associated with extremely large storm events during construction. This is unlikely during the summer construction period. With very little existing human impact in the upper watershed, and little possibility of substantial effects from this project, only short-term and negligible changes in aquatic habitat or fish populations in Canyon Creek watershed are expected.

Forest Plan and Regulatory Consistency

Implementing any of the options with the listed mitigation measures would be consistent with the 1987 Bitterroot Forest Plan standards and guidelines, as amended by INFISH. The irrigation district or their representatives are responsible for obtaining the State and federal permits (e.g. Montana-310, Clean Water Act-404). No Action may be inconsistent with Federal and State dam safety regulations.

The Biological Assessment contains the determination of “May Effect – Not Likely to Adversely Affect” for bull trout and “No Effect” for proposed bull trout critical habitat. The Biological Evaluation contains the determination of “may impact individuals or habitat, but will not likely contribute towards federal listing or loss of viability to the population or species” of westslope cutthroat trout.

The INFISH Standards and guidelines most relevant to this project are listed below with an explanation of how the standards and guidelines will be met with implementation of the action alternatives.

LH-1 Require...habitat conditions for...surface water development proposals that maintain or restore riparian resources, favorable channel conditions, and fish passage reproduction and growth....

Action alternatives and options may temporarily degrade riparian resources below Wyant Dam as a result of altering the flow path below the dam. Vegetation growth in the reservoir bed would improve.

Impacts from option D result from moving the spillway to a point above the existing outlet. Mitigation measures are required to minimize this effect, and the proposal contains the long-term goal of reconstructing the dam, which should restore the channel to its current condition in the long-term.

Fish passage through the spillway or outlet structure is currently unlikely to occur. The reconstruction would not change chances of fish passing through (via the outlet conduit) or over the dam (via the spillway). Breaching the Canyon Dam may result in fish upstream fish passage from the outlet stream to the lake.

The alternatives and options are not expected to influence fish reproduction and growth in the native fish habitat of the stream (downstream of the bedrock and talus falls). Fishes downstream may benefit from a more natural high and low water discharge cycle (hydrograph) of option C.

There would be some loss of fish production in the lake and in the non-native habitats, for the options that decrease the size of the lake.

RA-4 Prohibit storage of fuels and other toxicants, and other chemicals within Riparian Habitat Conservation Areas. Prohibit refueling in RHCA unless there are no other alternatives. Refueling sites in the RHCA must be approved by the FS and have an approved spill containment plan.

Requirements for a spill plan were part of the draft EIS and will be retained. There is no alternative to refueling in the RHCA. Refueling sites would be approved by the FS prior to heavy equipment arriving on the site.

MM-5 Permit sand and gravel mining and extraction within RHCAs only if no alternative, if the action(s) would not retard or prevent attainment of RMOs, and adverse effects to inland native fish can be avoided.

Materials to reconstruct the dam would come from within the RHCA. Most of the material would come from within the high-water mark of the reservoir. In this case, it is more desirable to take material from unvegetated sites near the dam and below the high-water mark than vegetated uplands.

Effects of Alternative 3

The difference between Alternatives 2 and 3 is that Alternative 2 would use more helicopter flights to transport crews and materials, and Alternative 3 would use more livestock to transport materials and people. Alternative 3 would require trail reconstruction and maintenance to improve trail access. In this regard, Alternative 3 would be more likely to impact fisheries. Trail improvement would likely require blasting, more livestock on-site, and slow the operation. Blasting may impact fish within the shock zone. The size of the shock zone varies with the depth and size of blast, substrate, and proximity to water. Livestock need to be fed and watered and may impact riparian vegetation. Heavy livestock and other traffic compacts and displaces soils in and near trails, which would be especially concerning in the tributary crossings and the near-stream trail sections. Extending the duration of the project exposes the site to more potential impacts. The risk of fuel spills may be about the same. Alternative 2 has risk because of the more extensive use of helicopters, but Alternative 3 would take longer resulting in fuels being onsite for longer. Alternative 3 would not eliminate enough helicopter trips to offset the impact of the trail improvement required, and the potential long-term effect of the trail.

Alternative 3 is the same as Alternative 2 with regard to regulatory and Forest Plan consistency, cumulative effects, and differences among the three options.

Summary of the Effects of the Alternatives and Options on the Fisheries Resource

Alternative 1 (*No Action*) has the greatest risk of adverse effects to fish. *No Action* has no construction impact, but sustains the substantial risk of dam failure and its impacts. Alternative 3 would not eliminate enough helicopter trips to off-set the impact of the trail improvement

required, and the potential long-term effect of an improved trail. Alternative 2 has less risk of long-term impact than no action, and less risk of impact than alternative 3.

Option A has the fewest direct impacts and option D has the most. Options B and C are between the two in direct impact. Option C has the greatest opportunity for indirect benefit: the return of unmanaged flow between the dam and the first diversion. Options B and D would have the most risk of fuel spills and be most likely to impact fisheries, but would reduce the need for more construction work in the future. Option D is the most time consuming, extending work over more than one season. Extending the duration of the project exposes the site to more potential impacts. Option D minimizes impacts in the summer of 2003 by using hand crew labor, but may use heavy equipment if hand labor is ineffective. The partial breach of option D is likely to result in channel adjustment in the wet meadow downstream of the dam during runoff. Impacts from these actions would be limited by mitigation measures, but the effects would not be eliminated.

SENSITIVE PLANTS AND NOXIOUS WEEDS

Existing Condition/Affected Environment

Analysis Area

The analysis area used for the evaluation of effects to sensitive plant species and their habitat is the area within 10 miles of the proposed activities. An evaluation of threatened, endangered, and sensitive plant species for the Canyon-Wyant Dam Rehabilitation Project was conducted to determine species most likely to be affected by the proposed activities.

The Montana National Heritage Program (MTNHP) database was reviewed for known locations of sensitive plants within the project area. Plant populations located as a result of past project-level surveys were also included. The analysis area was then assessed for inclusion of habitat that might be suitable for other sensitive plant species.

Using this evaluation method, a list was compiled of sensitive plant species that were known to occur within the project area, or had the potential to occur in the area based on suitable habitat.

Regulatory Framework

This section will provide a review of the possible effects of the alternatives on plant species listed, or proposed to be listed as Endangered or Threatened by the US Fish and Wildlife Service (USFWS), and/or species (and their habitats) designated as sensitive by the US Forest Service (USFS), Region 1, and determine whether or not they adversely affect any of these species.

The Endangered Species Act requires that the Forest Service conserve endangered and threatened species. The National Forest Management Act and Forest Service policy direct that National Forests be managed to maintain populations of all existing native plant and animal species at or above minimum population levels. A minimum viable population consists of the number of individuals adequately distributed throughout their range necessary to perpetuate the existence of the species in natural, genetically stable, self-sustaining populations. Plant species

for which population viability is a concern, are identified by the Forest Service as sensitive species. This category may include federal candidates (plants being studied by the U.S. Fish and Wildlife Service for proposed listing as threatened or endangered status), or plant species proposed for listing as threatened or endangered in the Federal Register (Lesica and Shelly, 1991). Forest Service policy requires that activities conducted on National Forests be reviewed for possible impacts on endangered, threatened or sensitive species (USDA Forest Service, 1992).

There is one federally listed threatened plant species in the state of Montana that is known to occur on National Forest Lands. Water howellia (*Howellia aquatilis*) was listed by the U.S. Fish and Wildlife Service on July 14, 1994. Water howellia is aquatic plant restricted to small pothole ponds or still waters of abandoned river oxbows. This species is not known to occur on the Bitterroot National Forest. The Northern Region Sensitive Plant Species List (USDA Forest Service, 1999) identifies a number of plants for each National Forest for which population viability is a concern. This list includes 32 vascular and three non-vascular plant species on the Bitterroot National Forest.

Consultation with the US Fish and Wildlife Service

Interagency cooperation between the Forest Service and USFWS regarding proposed, threatened, or endangered species, is described in Section 7 of the Endangered Species Act. Definitions relating to “consultation” and “conference” are given in FSM Supplement 2600-90-6.

No federally listed or proposed threatened or endangered plant species (or critical habitat) are known or suspected to occur within the project area, and none were located during field surveys.

Sensitive Plants

Field surveys for presence of sensitive plant populations and potential habitats were completed in 1996, on both Canyon and Wyant Dams for previous repair projects. Surveys were conducted for the eight plant species listed in Tables 2.11 and 2.12. The species were selected based on known occurrences and potentially suitable habitat within 10 miles of the project site. Existing borrow areas on the north and south sides of the Canyon Lake and Wyant Dams were also surveyed.

Plant species noted in the surveys include: pearly everlasting (*Anaphalis margaritacea*), yarrow (*Achillea millefolium*), Jacob’s ladder (*Polemonium pulcherrimum*), alpine fernleaf (*Pedicularis contorta*), elephanthead (*Pedicularis groenlandica*), hairy arnica (*Arnica mollis*), Jeffrey’s shooting star (*Dodecatheon jeffreyi*), yellow columbine (*Aquilegia flavescens*), false hellebore (*Veratrum viride*), beargrass (*Xerophyllum tenax*), partridge-foot (*Luetkea pectinata*), grouse whortleberry (*Vaccinium scoparium*), labrador tea (*Ledum glandulosum*), mountain heath (*Phyllodoce empetrifomis*), bush penstemon (*Penstemon fruiticosus*), white rhododendron (*Rhododendron albiflorum*), menziesia (*Menziesia ferruginea*), red raspberry (*Rubus idaeus*), subalpine fir (*Abies grandis*), alpine larch (*Larix lyalli*), lodgepole pine (*Pinus contorta*), and whitebark pine (*Pinus albicaulis*). These species occur on the previously used borrow areas and surrounding area.

Noxious Weeds.

The project area was surveyed for the presence of noxious weed species. No noxious weed species are present on either the Canyon or Wyant Dams, but spotted knapweed (*Centaurea maculosa* {*C. biebersteinii*}) is known to be present at the Canyon Lake trailhead. The presence of spotted knapweed both along the trail and at the trailhead is very sparse due to the shaded conditions provided by the conifer over-story (spotted knapweed does not compete well in shaded environments). Spotted knapweed density is slightly higher near the Blodgett Overlook, to the north of the project area, on some of the more open, south-facing slopes.

Spotted knapweed is present along most roads and trails in the surrounding area. Spotted knapweed is also currently established on most sparse-canopied south slopes with road access. This species is present where openings in the canopy at the lower to middle elevations are large enough to allow plant survival and reproduction. Heavy infestations of St. Johnswort (*Hypericum perforatum*) occur in the Camas Creek drainage, and along the Lost Horse Road, approximately 7 miles to the south of the project area. Populations of St. Johnswort have also been found in the Lick Creek drainage. This species is aggressive and is known to compete with knapweed for habitat and is much more difficult to eradicate. Chemical treatments and biological agent releases have been applied to aid in containment of this noxious weed. Oxeye daisy (*Chrysanthemum leucanthemum*) also is found along the roadsides, in common associated with spotted knapweed. This species can thrive on nutrient poor soils, but has a wide edaphic tolerance. Other species commonly found throughout the Forest include sulfur cinquefoil (*Potentilla recta*) and houndstongue (*Cynoglossum officinale*). Houndstongue is located primarily along the roads, trails and campsites or other high-use areas. Sulfur cinquefoil is often found intermingled with spotted knapweed infestations throughout the Forest. Common tansy (*Tanacetum vulgare*) is another species becoming more common along the roadsides on the Stevensville District, but has not yet been adequately mapped because of its very recent listing as a noxious weed in the State of Montana. The project area should be monitored for weed presence in disturbed areas, and control efforts should be initiated if any of these species are found.

Many noxious weed species are typically not as competitive at higher elevations, such as the elevation range in the project area. These species are most aggressive in the lower to middle elevation ranges where they are more commonly found. However, many species exhibit tolerance to a wide range of habitat types and may quickly adapt to environments that they do not typically occupy. Therefore, every effort should be made to minimize the risk of spread of noxious weeds.

Environmental Consequences

Effects Common to All Action Alternatives

Summary of Findings

The risk of adverse effects from the proposed project activities (including related activities and/or cumulative effects) was evaluated for 8 sensitive plants known or suspected to occur on the BNF within the habitats being surveyed. None of the eight species identified (Tables 2.11

and 2.12) were located during the surveys, although suitable habitat does exist in the project area for Bitterroot bladderpod, storm saxifrage, rough fleabane, western boneset and Idaho douglasia.

Although no sensitive plant species are known to occur within the analysis area, the potential impacts to suitable habitat are reviewed for possible residual effects beyond the completion of the activity. Shifts in habitat suitability due to successional changes, or slow changes in hydrology, are examples of such effects. Exact impacts of potential residual effects are largely unknown for many species; therefore ongoing field investigations of known populations are used to make the most informed assessment possible. An important consideration may be the retention of suitable but unoccupied habitat. Because the activities associated with this project are localized in nature, the potential for residual effects to sensitive plant species or their habitat is low.

No noxious weed species are present on either the Canyon or Wyant Dams, but spotted knapweed is known to be present at the Canyon Lake trailhead. The presence of spotted knapweed both along the trail and at the trailhead is very sparse due to the shaded conditions provided by the conifer overstory (spotted knapweed does not compete well in shaded environments). Spotted knapweed density is slightly higher near the Blodgett Overlook on some of the more open, south-facing slopes.

In an effort to forestall weedy invasions and promote native community recovery on areas of exposed soil resulting from proposed activities, the Forest Botanist has provided recommendations in a Revegetation Plan located in the Project File (PF 3.10).

Environmental Effects:

Alternative 1

The No Action Alternative would have no direct or indirect effects on sensitive plant species or their habitat.

Alternative 2

The options within this alternative are not likely to adversely affect any sensitive plant species, since none are known to occur in the project area. The size of the area likely to be disturbed during the construction activities will be localized and limited to the immediate area and existing borrow areas. Potentially suitable habitat for Bitterroot bladderpod, storm saxifrage, western boneset, rough fleabane, or Idaho douglasia may be disturbed by machinery accessing the construction site, but should not impact the overall population viability of these species. Use of lakebed material from the west end of Canyon Lake for dam fill material, would not likely impact sensitive plant populations or their habitat. Partial breaching the Wyant Dam is not likely to result in impacts to vegetation between Wyant and Canyon lake, since Wyant lake is currently storing only about 20% of its potential.

The activities associated with maintenance and repair will likely create the type of disturbance that would promote colonization by invasive species (noxious weeds) on exposed soil.

Equipment used in repair activities could inadvertently transport weeds seeds to the site, if not properly cleaned (see mitigation measures pertaining to construction equipment and noxious weeds). Although noxious weed species are not known to be competitive at the elevation range in the project area, every effort should be made to minimize or avoid transporting weed seeds to the area.

Performing the necessary repair work in two phases, as described in Option D of this alternative, will not result in any additional disturbance or impacts beyond what is expected from the other options. Re-entering the area during Phase 2 will require the same revegetation and noxious weed management considerations as those required during Phase 1.

Alternative 3

The potential impacts that are likely under this alternative are similar to Alternative 2 (Option A and B). Construction of a trail between Wyant and Canyon Lakes to access Wyant with equipment as well as the reconstruction of Trail #525 would disturb potentially suitable habitat, but should not impact population viability of any of the species. The risk of noxious weed invasion along the trails is highest when the soil is exposed, and adherence to the noxious weed prevention practices will reduce the likelihood of noxious weed occurrence.

The proposed breaching of Canyon and Wyant Dams (Option C) is not likely to adversely affect any sensitive plant species, since none are known to occur in the project area. The size of the area likely to be disturbed during the breach activities will be localized and limited to the immediate area and existing borrow areas. Potentially suitable habitat may be disturbed by machinery accessing the construction site, but should not impact the population viability of these species. Breaching of the dams would include allowing the stored water to draw down naturally, at which point the gates would be left open. Equipment would be brought in after late season draw down to complete the breaching process (removal of the dam and headgates, etc). This process will produce localized impacts to the area immediately around the dam, but will not result in any effects on sensitive plants and their habitat.

Activities associated with maintenance and repair of the dams will likely create the type of disturbance that would promote colonization by invasive species (noxious weeds), by creating areas of bare soil. Equipment used in repair activities could inadvertently transport weeds seeds to the site, if not properly cleaned (see mitigation measures pertaining to construction equipment and noxious weeds). Although noxious weed species are not known to be competitive at the elevation range in the project area, every effort should be made to minimize or avoid transporting weed seeds to the area.

In conclusion, the proposed repair project is not likely to adversely impact individual sensitive plant populations, since none are known to occur in the immediate area. There may be some impact to potentially suitable habitat for Bitterroot bladderpod, storm saxifrage, western boneset, rough fleabane, or Idaho douglasia, but these impacts are not likely to affect the overall population viability of any of these species. Although the project may create soil disturbance for invasive species encroachment, adhering to guidelines suggested in the Region 1 “Weed Prevention Practices (FSM 2080)” (PF 3.9) for construction activities should minimize the risk of noxious weed spread and invasion into disturbed areas.

Cumulative Effects

The analysis area for cumulative effects to sensitive plant species and their habitat is the area within 10 miles of the project site. Major past activities include construction of trails and the Forest system road which increased human access and use of the area, timber harvest, and wildland fire and associated suppression activities during the Blodgett Fire (2000). Most of the analysis area is designated Wilderness or unroaded, so only limited management activities have occurred.

The direct and indirect effects of all the alternatives are described above. None of the proposed activities would substantively contribute to the existing cumulative effects. Reasonably foreseeable future projects in the analysis area include noxious weed treatments along existing roads and trails, improvements to the Blodgett Creek Campground and trailhead, and road upgrade projects on the Blodgett and Canyon Creek roads. None of the alternatives would affect overall population viability of any of the identified sensitive plant species (tables 2.11 and 2.12).

Revegetation

Revegetation of Canyon Lake Dam, Part A and B

Little or no revegetation would be needed to complete Part A of the repair. If Part B were necessary then the dam would need some revegetation work. Bluejoint reedgrass (*Calamagrostis canadensis*) is a native rhizomatous grass growing on the dam and nearby. Transplanting from areas with dense growth can be attempted or seed could be collected for propagation as plugs for planting. Shrub and forb seeds could also be collected from on site species such as pink mountain heather (*Phyllodoce empetrifomis*), subalpine spiraea (*Spiraea densiflora*), Labrador tea (*Ledum glandulosum*), red raspberry (*Rubus idaeus*), white rhododendron (*Rhododendron albiflorum*), yarrow (*Achillea millefolium*), hairy arnica (*Arnica mollis*) and pearly everlasting (*Anaphalis margaritacea*). The granitic soils in the area would be supplemented with lakebed sediment but it might still be necessary to use soil amendments to ensure success. Organic, slow release fertilizers are the best amendment for this purpose.

Revegetation of Wyant Dam Breach, all Alternatives

After the dam is removed the slopes will be recontoured and filled with riprap as much as possible. This should preclude the need for seeding. Fill material can be placed between rocks with native shrub plantings to assist in vegetative recovery. There may be some need for revegetation on the west-facing banks of the lake where the dam previously existed. Areas along the lakeshore where water drains into the dam from above may also need some revegetation to prevent erosion. However, it is also possible that the lakeshore is rocky enough that such erosion may not occur. Revegetation in these areas could wait until the reservoir is emptied to assess the extent of erosion control needed. Plant species used would be the same as for the Canyon Dam area.

WILDLIFE

Existing Condition/Affected Environment

Analysis Area

The analysis area used for evaluation of effects to wildlife species is the entire Canyon Creek drainage west of the National Forest boundary. This drainage provides habitat for wildlife species typically found in coniferous forests of western Montana. Elk, mule deer, and white-tailed deer are resident in the area. Moose occur primarily in or near the creek bottoms and adjacent thickly vegetated north aspects. Mountain goat winter and summer range is found along the steep south-facing cliffs in the area. Other resident species of interest include black bear, mountain lion, coyote, furbearers, and numerous birds and small mammals.

Wildlife habitat in the drainage includes riparian vegetation along Canyon Creek, large grassy or rocky openings with scattered ponderosa pine and Douglas-fir on many of the south facing slopes, and extensive areas of montane forest dominated by lodgepole pine, Douglas-fir and sub-alpine fir on the north aspects. With increased elevation, the forest transitions into whitebark pine. In addition to streamside riparian zones, portions of the drainage contain seeps and wallows that provide riparian vegetation associated with high water table areas. These wet areas are extremely important as microsites providing habitat for small mammals and birds as well as big game species.

There is little known about pre-settlement wildlife population numbers or distribution for this area. Old trapping records and historic journals provide some presence/absence information. Providing diverse habitats that represent naturally functioning ecosystems will maintain the complex of species that would occur in those systems.

Wildlife species and habitat evaluated in this analysis include: Forest Plan management indicator species, Threatened, Endangered and Sensitive species listed for the Bitterroot National Forest) and species of special interest or with unique or limited habitat in the assessment area (mountain goat).

Regulatory Framework

The two principle laws relevant to wildlife management are the National Forest Management Act of 1976 (NFMA) and the Endangered Species Act of 1973 (ESA). Regulations promulgated subsequent to passing NFMA require the Forest Service to manage fish and wildlife habitat to maintain viable populations of all native and desirable non-native wildlife species and conservation of listed Threatened or Endangered species populations (36CFR219.19). Additional guidance is found in Forest Service Manual (FSM) Direction, which states; identify and prescribe measures to prevent adverse modifications or destruction of critical habitat and other habitats essential for the conservation of endangered, threatened, and proposed species (FSM 2670.31 (6)). ESA requires Forests to manage for the recovery of threatened and endangered species and the ecosystems upon which they depend. Forests are required to consult with the Fish

and Wildlife Service if a proposed activity may affect the population or habitat of a listed species.

The FSM also directs the Regional Forester to identify sensitive species for each National Forest where species viability may be a concern. Forests are then required to monitor sensitive species populations and prevent declines that might require listing under ESA (FSM 2670.32 (4)).

The principle policy document relevant to wildlife management is the Bitterroot Forest Plan of 1987. This document provides standards and guidelines for management of wildlife species and habitats on the Forest. The Record of Decision (1987) for this plan requires retention of 25 percent of the big game winter range in thermal cover. Other Forest Plan standards related to maintenance of wildlife populations include standards for amount and distribution of old growth habitat by management area, retention of snags, maintenance of elk populations and habitat, and management of elk habitat effectiveness through the Travel Planning process (USDA, Forest Service, 1987).

Existing Condition/Affected Environment, Environmental Consequences and Forest Plan Compliance

Management Indicator Species

Elk

Existing Condition

A large elk herd winters on both private and National Forest lands north of Canyon Creek on the face between Blodgett and Mill Creeks. Another large elk herd winters on similar lands to the south of Canyon Creek on a series of faces between Barley and Hayes Creeks. There appears to be little winter elk use in Canyon Creek itself. There is probably scattered elk use of the Canyon Creek drainage during the summer, but this use appears to be quite limited (Nielsen 1994, pers. comm.). The Canyon Creek drainage, which contains the project area, is unroaded above the existing trailhead.

Direct and Indirect Effects

Since the analysis area is unroaded and no new road construction would occur under any alternative, there would be no change to existing open road densities, Elk Habitat Effectiveness, or elk security areas. Therefore, there is no need to analyze road densities or Elk Habitat Effectiveness further.

Alternative 1

The No Action Alternative would have no direct or indirect effects on elk or elk habitat.

Alternative 2

None of the options within this alternative would affect elk habitat percentages or alter existing cover/forage ratios.

Minor disturbance to elk could occur as a result of the construction activities proposed at the dams under this alternative. Helicopter flights to the dams could also disturb elk to some extent. Workers or administrative personnel walking up the trail to the dams would not disturb elk any more than a hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to elk.

Alternative 3

None of the options within this alternative would affect elk habitat percentages or alter existing cover/forage ratios.

Minor disturbance to elk could occur as a result of the construction activities proposed at the dams under this alternative. Helicopter flights to the dams could also disturb elk to some extent. The trail improvement and construction required to access the dams with pack stock, and to restore the trails to their original condition after the project has the potential to cause longer lasting, more severe disturbance to elk in the area. Workers or administrative personnel walking up the trail to the dams would not disturb elk any more than a hiking party. Even with this level of disturbance, the most likely response from elk would be to move away from the disturbance, possibly to another drainage. There would be no lasting adverse effects to elk. The proposed trail improvement and construction would likely lead to increased recreational use of the trail and the areas around Canyon and Wyant Lakes. This increased use could result in minor additional disturbance effects to elk in the future.

Cumulative Effects

The analysis area for cumulative effects to elk is the Blodgett-Roaring Lion elk herd unit. The existing condition reflects the sum of past activities. Major past activities include construction of the trails and the Forest road system which increased human access to the area and resulted in increased hunting season mortality, and the advent of successful fire suppression which resulted in more cover and less forage habitat than was present historically. Timber harvest has reduced the effect of fire suppression to some extent by reducing cover and increasing forage habitat in harvest units. Much of the forest on the lower part of Romney Ridge was killed by high-intensity fire during the Blodgett Trailhead fire in 2000. Most of the area is wilderness or unroaded, so only limited management activities have occurred.

The direct and indirect effects of all of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects. Reasonably foreseeable future projects in this elk herd unit include spraying herbicides along the roads and trails to control noxious weeds, improvements to the Blodgett Creek Campground and trailhead, and surfacing of parts of the Blodgett and Canyon Creek roads.

None of the alternatives would affect the viability of elk at any scale.

Forest Plan Compliance

The Canyon and Wyant Dams project does not include any timber management activities. Therefore, there is no Forest Plan direction to analyze elk habitat classifications in the Canyon Creek drainage. No changes to existing elk habitat ratios are anticipated as a result of this project.

All alternatives meet Forest Plan standards for elk habitat and elk habitat effectiveness (FP II-21) because none would change the existing condition. The Forest Plan Record of Decision requires retention of 25% thermal cover in elk winter range. All alternatives are consistent with this requirement since none would alter existing thermal cover percentages. There is no Forest Plan standard regarding elk security area.

Pine Marten

Existing Condition

Pine marten are a Forest Plan Management Indicator Species (MIS) for those wildlife species that are associated with upper elevation mature and over-mature forest, including small mammals, which require down and dead woody cover. Upper elevation forests in the Canyon Creek area are typically composed of lodgepole pine, sub-alpine fir and Englemann spruce.

Optimum habitat for pine marten includes forests with crown closures greater than 50 percent, where spruce and true firs exceed 40 percent of the total stand composition. At least 20 percent of the forest floor should be littered with downfall greater than 3 inches in diameter. Home range sizes of marten vary based on habitat quality and food availability, but average approximately 600 acres for males and 250 acres for females in Montana (Allen, 1984). To provide sufficient habitat in scarce food years, this area may expand to as much as 1920 acres of suitable habitat in the northern Rocky Mountains.

Good pine marten habitat in the Canyon Creek drainage occurs mostly in the creek bottoms and on the lower north aspects above the creek bottoms. A research project conducted by Dr. Kerry Foresman, professor with the Division of Biological Sciences at the University of Montana indicates that marten are relatively common in all of the large creek bottoms dissecting the Bitterroot Mountains that he studied. While Canyon Creek was not part of the study area, it is likely that it also contains a sizeable marten population.

There is no need to analyze and calculate Habitat Suitability Indices for marten in this analysis since there is no vegetative manipulation contemplated which would alter the existing condition.

Direct and Indirect Effects

Alternative 1

The No Action Alternative would have no direct or indirect effects on marten or their habitat.

Alternative 2

None of the options within this alternative would affect existing marten habitat.

Construction activities proposed at the dams under this alternative would not affect marten since the dams are not marten habitat. Helicopter flights to the dams would have little effect on marten, which are largely nocturnal. Workers or administrative personnel walking up the trail to the dams would not disturb marten any more than a hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to marten.

Alternative 3

None of the options within this alternative would affect existing marten habitat.

Construction activities proposed at the dams under this alternative would not affect marten since the dams are not marten habitat. Helicopter flights to the dams would have little effect on marten, which are largely nocturnal. The trail improvement and construction required to access the dams with pack stock, and to restore the trails to their original condition after the project has the potential to cause some disturbance to marten in the area. Workers or administrative personnel walking up the trail to the dams would not disturb marten any more than a hiking party. It is unlikely that this level of disturbance would have any lasting adverse effects to marten. The proposed trail improvement and construction would likely lead to increased recreational use of the trail and the areas around Canyon and Wyant Lakes. This increased use could result in minor additional disturbance effects to marten in the future.

None of the alternatives would affect the viability of marten at any scale.

Cumulative Effects

The analysis area for cumulative effects to marten is the Canyon Creek drainage. The existing condition reflects the sum of past activities. Major past activities in this area are described in the elk section.

The direct and indirect effects of all of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects. Reasonably foreseeable future projects in the Canyon Creek drainage include spraying herbicides along the roads and trails to control noxious weeds, and surfacing of parts of the Blodgett and Canyon Creek roads.

Consistency with the Bitterroot Forest Plan

Both alternatives meet Forest Plan standards for pine marten (FP II-19), since both retain existing old growth habitat.

Pileated Woodpecker

The pileated woodpecker is a Forest Plan MIS for those wildlife species that are associated with lower elevation mature and over-mature forest, including the primary and secondary cavity

nesters that require snags and down woody material as a nesting and foraging component of their habitat. Lower elevation forests in the Canyon Creek area are typically composed of ponderosa pine and Douglas-fir, with some black cottonwood mixed in on moister habitats.

Optimum habitat for pileated woodpeckers includes extensive areas that contain large numbers of trees and snags that exceed 20" Diameter at Breast Height (DBH), including some snags that exceed 30" DBH. Ponderosa pine, western larch, and black cottonwood are the preferred species for nesting. Numerous stumps and abundant down woody material are also important as foraging habitat. Areas above 6,500 feet are considered non-habitat on the Bitterroot National Forest, although sporadic foraging use does occur in some stands above this elevation.

Habitat quality on the Bitterroot National Forest is generally less than optimum due both to the naturally limited productivity of much of the area and to previous management activities. An average of approximately 500-1000 acres of lower quality habitat is required to support one nesting pair of pileated woodpeckers. Of this, 100 acres of optimal habitat should be available for nesting. Feeding habitat must also be available within the 1000 acre home range surrounding the nesting core (Warren 1990).

Pileated woodpecker transects completed annually for the past several years as part of the Forest Plan monitoring effort show highly variable results which do not seem to indicate any particular Forest-wide population trend (Forest Plan Monitoring and Evaluation Report, FY 2000). The closest pileated woodpecker transect to this project is along the trail around Lake Como.

There is no need to analyze and calculate Habitat Suitability Indices for pileated woodpeckers in this analysis since there is no vegetative manipulation contemplated which would alter the existing condition.

Direct and Indirect Effects

Alternative 1

The No Action Alternative would have no direct or indirect effects on pileated woodpeckers or their habitat.

Alternative 2

None of the options within this alternative would affect existing pileated woodpecker habitat.

Construction activities proposed at the dams under this alternative would not affect pileated woodpeckers since the dams and surrounding areas are not suitable habitat for this species. Helicopter flights to the dams could potentially disturb pileated woodpeckers to a minor degree. Workers or administrative personnel walking up the trail to the dams would not disturb pileated woodpeckers any more than a hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to pileated woodpeckers.

Alternative 3

None of the options within this alternative would affect existing pileated woodpecker habitat.

Construction activities proposed at the dams under this alternative would not affect pileated woodpeckers since the dams are not suitable habitat for this species. Helicopter flights to the dams could potentially disturb pileated woodpeckers to a minor degree. The trail improvement and construction required to access the dams with pack stock, and to restore the trails to their original condition after the project has the potential to cause some disturbance to pileated woodpeckers in the area. Workers or administrative personnel walking up the trail to the dams would not disturb woodpeckers any more than a hiking party. It is unlikely that this level of disturbance would have any lasting adverse effects to pileated woodpeckers. The proposed trail improvement and construction would likely lead to increased recreational use of the trail and the areas around Canyon and Wyant Lakes. Increased use of the trail to Canyon Lake could result in minor additional disturbance effects to pileated woodpeckers in the future. Increased recreational use around the lakes would not affect this species because there is no suitable habitat in the immediate area.

Cumulative Effects

The analysis area for cumulative effects to pileated woodpeckers is the Canyon Creek drainage. The existing condition reflects the sum of past activities. Major past activities in this area are described in the elk section.

The direct and indirect effects of all of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects. Reasonably foreseeable future projects in the Canyon Creek drainage include spraying herbicides along the roads and trails to control noxious weeds, and surfacing of parts of the Blodgett and Canyon Creek roads.

None of the alternatives would affect the viability of pileated woodpeckers at any scale.

Consistency with the Bitterroot Forest Plan

Both alternatives meet Forest Plan standards for pileated woodpeckers (FP II-19), since both retain existing old growth habitat.

Threatened and Endangered Wildlife Species

The Forest Plan provides direction regarding Threatened, Endangered and Sensitive species at II-21.

Threatened and Endangered Species

The U.S. Fish & Wildlife Service (USFWS) lists lynx, bald eagle, gray wolf, and grizzly bear as Threatened and Endangered wildlife species that could occur on the Bitterroot National Forest. The Biological Assessment (BA) for the Canyon and Wyant Lake Dams Project EIS will document expected effects of the preferred alternative to these Threatened and Endangered

wildlife species. Short habitat descriptions, known existing conditions for these species within the Canyon Creek area and a summary of the effects discussion in the BA are summarized below.

Lynx (*Lynx canadensis*) - Status Threatened

Lynx utilize mature and overmature spruce and subalpine fir forests that contain abundant deadfall for denning and resting. Preferred lynx foraging habitat typically consists of dense stands of sapling-sized conifers that provide good habitat for snowshoe hare, their primary prey species (Ruggiero, et al. 2000). Good lynx habitat consists of a mosaic of both of these structural stages in close proximity. Lynx territories are large, which results in relatively low population densities even in optimal habitat. Lynx abundance and density is partially dependent on cyclic snowshoe hare population fluctuations and on trapping pressure.

Lynx appear to be quite uncommon throughout the Bitterroots, but one was reported in upper Lick Creek in 2000. Some suitable lynx habitat occurs in the upper elevation portions of the Canyon Creek drainage, and it is possible that lynx use the area to a limited extent. The high, rocky ridges of the Bitterroot Mountains create barriers to lynx movements between the Canyon Creek drainage and adjacent drainages, but there are no barriers to lynx movement created by human activities.

The analysis area is part of the 111,450-acre Blodgett-Lost Horse Lynx Analysis Area (LAU). About 19 percent of this LAU is classified as lynx habitat, while only 3 percent of the LAU is classified as lynx foraging habitat. Lack of suitable foraging habitat (primarily dense, 20 to 40 year old conifer stands at mid to upper elevations) is probably a limiting factor for lynx in this LAU.

Direct and Indirect Effects

Alternative 1

The No Action Alternative would have no direct or indirect effects on lynx or their habitat.

Alternative 2

None of the options within this alternative would affect existing lynx habitat. The dams and areas in the immediate vicinity are not suitable lynx habitat.

Construction activities proposed at the dams under this alternative could disturb individual lynx, but, but would not affect lynx populations since the dams and surrounding areas are not suitable habitat for this species. Helicopter flights to the dams could potentially disturb lynx to a minor degree. Workers or administrative personnel walking up the trail to the dams would not disturb lynx any more than a hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to lynx.

Alternative 3

None of the options within this alternative would affect existing lynx habitat. Construction activities proposed at the dams under this alternative could disturb individual lynx, but would not affect lynx populations since the dams and surrounding areas are not suitable habitat for this species. Helicopter flights to the dams could potentially disturb lynx to a minor degree. The trail improvement and construction required to access the dams with pack stock, and to restore the trails to their original condition after the project has the potential to cause some disturbance to lynx in the area. Workers or administrative personnel walking up the trail to the dams would not disturb lynx any more than a hiking party. It is unlikely that this level of disturbance would have any lasting adverse effects to lynx. The proposed trail improvement and construction would likely lead to increased recreational use of the trail and the areas around Canyon and Wyant Lakes. This increased use could result in minor additional disturbance effects to lynx in the future.

Cumulative Effects

The analysis area for cumulative effects to lynx is the Blodgett-Lost Horse LAU. The existing condition reflects the sum of past activities. Major past activities in this area are described in the elk section.

The direct and indirect effects of all of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects. Reasonably foreseeable future projects in the Blodgett-Lost Horse LAU include spraying herbicides along the roads and trails to control noxious weeds, improvements to the Blodgett Creek Campground and trailhead, surfacing of parts of the Blodgett and Canyon Creek roads and fuels management treatments authorized in the Lost Moose CE. None of these activities would occur in suitable lynx habitat, so none would affect lynx.

Effects Call

The effects call for lynx in the Biological Assessment is May Effect, Not Likely to Adversely Effect. The Forest will consult with the USFWS on effects of this project to lynx. . None of the alternatives would affect the viability of lynx at any scale.

Biological Opinion

The USFWS issued a biological opinion on March 26, 2003, that the Canyon and Wyant Lake Dam Project as proposed, is not likely to jeopardize the continued existence of the Canada lynx. No critical habitat has been designated for this species, therefore, none will be affected. Effects stemming from implementation of the proposed action are likely insignificant or discountable.

Bald Eagle (*Haliaeetus leucocephalus*) - Status Threatened

The Bitterroot Valley provides winter and spring/fall habitat for a substantial population of bald eagles. Most of these birds usually arrive in the valley in November and leave the area in February and March for northern breeding grounds. Winter bald eagle use seems to be restricted to the Bitterroot Valley and is concentrated along the river corridor. Wintering bald eagles forage for fish along ice-free portions of the Bitterroot River and also feed on road-killed deer within several miles of the river. Wintering birds generally roost communally in large trees near the river. There are no reports of communal roosts on BNF land outside of this corridor.

Other eagles migrate through the area both in spring and fall. Migrating birds are sometimes seen soaring over BNF land during the spring and fall, and some may use the larger lakes such as Lake Como for foraging at this time. There were three active bald eagle nests in the Bitterroot valley in 2002. The breeding population seems to be expanding, but known nests are all along the Bitterroot River.

It is remotely possible that bald eagles could establish a winter roost site low in the Canyon Creek area sometime in the future, but the area is generally not considered to be bald eagle habitat. It is highly unlikely that bald eagles will ever use the area for nesting.

Direct, Indirect and Cumulative Effects

None of the alternative would have any direct, indirect or cumulative effects to bald eagle habitat or populations since the project area contains no suitable habitat for this species.

Effects Call

The effects call for bald eagles in the Biological Assessment is No Effect. There is no need to consult with USFWS about project effects to this species. None of the alternatives would affect the viability of bald eagles at any scale.

Gray Wolf (*Canis lupus*) - Status Endangered (Non-essential, experimental)

The entire BNF including the analysis area is part of the Central Idaho Non-essential, Experimental Population Area (CINEPA) designated by USFWS (USDI 1994). Wolves within this area are treated as a population proposed for listing rather than as a listed species under Section 10(j) of the ESA. There is no critical habitat designated within the CINEPA, and no land use restrictions are to be applied after six or more wolf packs occupy the area.

USFWS reintroduced Canadian wolves in the Frank Church Wilderness in Idaho in 1995 and 1996. These wolves and their progeny have since dispersed widely through northern Idaho and western Montana. There is some evidence that wolves from the reintroduction have passed through the Canyon Creek drainage, but there has been no evidence of wolves denning nearby. There were 19 known packs within the CINEPA at the end of 2001 (USDI 2002).

Direct and Indirect Effects

Alternative 1

The No Action Alternative would have no direct or indirect effects on wolves or their habitat.

Alternative 2

None of the options within this alternative would affect existing wolf habitat or known den sites. There is a chance that construction activities and/or helicopter flights to the dams could potentially disturb wolves if any happened to be in the area. Workers or administrative personnel walking up the trail to the dams would not disturb wolves any more than a hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to wolves.

Alternative 3

None of the options within this alternative would affect existing wolf habitat or known den sites.

There is a chance that construction activities and/or helicopter flights to the dams could potentially disturb wolves if any happened to be in the area. The trail improvement and construction required to access the dams with pack stock, and to restore the trails to their original condition after the project has the potential to cause some disturbance to wolves in the area. Workers or administrative personnel walking up the trail to the dams would not disturb wolves any more than a hiking party. It is unlikely that this level of disturbance would have any lasting adverse effects to wolves. The proposed trail improvement and construction would likely lead to increased recreational use of the trail and the areas around Canyon and Wyant Lakes. This increased use could result in minor additional disturbance effects to wolves in the future.

Cumulative Effects

The analysis area for cumulative effects to wolves is the CINEPA. The existing condition reflects the sum of past activities. Major past activities in this area are described in the elk section. The direct and indirect effects of all of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects. Reasonably foreseeable future projects in the CINEPA are listed in the Burned Area Restoration EIS (USDA Forest Service, 2001).

Effects Call

Wolves within this area are treated as a population proposed for listing rather than as a listed species under Section 10(j) of the ESA. Therefore, the effects call in the Biological Assessment is Not Likely to Jeopardize. There is no need to consult with USFWS about project effects to this species. None of the alternatives would affect the viability of wolves at any scale.

Grizzly Bear (*Ursus arctos*) - Status Threatened

Grizzly bears are habitat generalists that occupied portions of the Bitterroot drainage historically, but were essentially extirpated from the drainage by the 1930s. The U.S. Fish and Wildlife Service (USFWS) currently classifies grizzlies as a possible transient in the Bitterroot NF, but there have been no confirmed sightings anywhere on the Forest or in the vicinity of the analysis area for many years. The analysis area is included in both the Bitterroot Grizzly Bear Recovery Zone designated by USFWS (USDI 1993), and the more recent Bitterroot Grizzly Bear Experimental Population Area designated by USFWS (USDI 2000).

USFWS authorized reintroduction of grizzly bears into the Selway-Bitterroot ecosystem under a non-essential, experimental population designation (USDI 2000), but the reintroduction effort is currently on indefinite hold for political reasons. The analysis area is suitable grizzly habitat from the standpoint of the existing vegetation, and it is possible that grizzlies could use the Canyon Creek drainage to some extent if they did reoccupy the Selway-Bitterroot ecosystem.

Direct and Indirect Effects

Alternative 1

The No Action Alternative would have no direct or indirect effects on grizzly bears or their habitat.

Alternative 2

None of the options within this alternative would affect existing grizzly bear habitat and there would be no effects to critical habitat designated in a recovery plan. Project activities would not affect grizzly bear populations since none occur in the Bitterroot Mountains at this time.

Alternative 3

None of the options within this alternative would affect existing grizzly bear habitat, and there would be no effects to critical habitat designated in a recovery plan. Project activities would not affect grizzly bear populations since none occur in the Bitterroot Mountains at this time.

Cumulative Effects

The analysis area for cumulative effects to grizzly bears is the Bitterroot Grizzly Bear Experimental Population Area. The existing condition reflects the sum of past activities. These include: trapping and poisoning, which directly reduced grizzly numbers; construction of an extensive forest road system which improved human access and made grizzlies more vulnerable to hunting and disturbance; and fire suppression, which resulted in denser forests that reduced productivity and availability of grizzly forage plants. Timber harvest tended to reverse this trend, but has occurred on relatively few acres. Overall, habitat conditions for grizzly bears have declined across the Forest. To the best of our knowledge, there have been no resident grizzly bears on the Forest for more than 50 years.

The direct and indirect effects of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects. Reasonably foreseeable future projects in the CINEPA are listed in the Burned Area Restoration EIS (USDA Forest Service, 2001).

Effects Call

The effects call for grizzly bears in the Biological Assessment is No Effect. There is no need to consult with USFWS on project effects to this specie. None of the alternatives would affect the viability of grizzly bears at any scale.

Consistency with the Bitterroot Forest Plan and Other Regulatory Direction

All alternatives meet Forest Plan standards (FP II-21) and ESA requirements for the conservation of Threatened and Endangered wildlife species.

Sensitive Species

Sensitive wildlife species are those animal species identified by the Regional Forester for which population viability is a concern, as evidenced by:

- Significant current or predicted downward trends in population numbers or density.
- Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

Management goals for sensitive species are to maintain viable populations of a species throughout its existing range within the planning area (FSM 2670.5 19, 28). The planning area is the Bitterroot National Forest, not the project area. Special management emphasis is provided to ensure sensitive species viability and preclude trends toward endangerment that would result in the need for Federal listing as Threatened or Endangered under the Endangered Species Act of 1973. A biological evaluation must be conducted to determine the effects of proposed actions on sensitive species.

Suitable habitat exists within the Canyon Creek drainage for a number of the TES wildlife species listed as possibly occurring on the BNF. There is no known suitable habitat within the Canyon Creek drainage for northern bog lemmings (no sphagnum bogs), northern leopard frogs (no ponds with emergent vegetation at low elevations) or Townsend's big-eared bat (no caves or mine adits), so these species are not expected to occur in the drainage. The Biological Evaluation (project file) documents expected effects of the preferred alternative to sensitive wildlife species known or suspected to occur within the analysis area.

Peregrine Falcon (*Falco peregrinus*)

Peregrine falcons typically nest on ledges in high inaccessible cliff faces (or tall buildings when introduced in an urban setting) which dominate the surrounding area, and forage for avian prey

in open habitats including prairie, tundra, open forests and over marshes and lakes (Dobkin, 1992; Reel et al., 1989). Habitat surveys for the Bitterroot National Forest identified suitable nesting sites along the west side of the valley on numerous cliffs in or adjacent to the Selway-Bitterroot Wilderness.

Peregrine falcons were reintroduced to the Bitterroot Mountains through a series of releases of captive-bred birds between 1989 and 1993. There are now a number of known or suspected peregrine falcon breeding territories established in the Bitterroot Mountains between Florence and Darby. There is some suitable nesting habitat in the Canyon Creek drainage, but repeated surveys in 2000, 2001 and 2002 failed to detect any sign of an active peregrine eyrie, possibly due to golden eagles that we suspect are nesting somewhere in the canyon. Peregrines from the adjacent Blodgett Creek territory may use Canyon Creek to some extent for foraging.

Direct and Indirect Effects

Alternative 1

The No Action Alternative would have no direct or indirect effects on peregrine falcons or their habitat.

Alternative 2

None of the options within this alternative would affect existing peregrine falcon habitat. Project construction activities would not affect peregrines foraging in the area. Explosives used to provide rock for the rock crusher in Option B could disturb peregrine falcons nesting in the drainage if a nest was active at the time of the blasting. This is unlikely, both because construction activity would occur after the typical nesting season has ended, and because the Canyon Creek drainage does not appear to contain a peregrine eyrie.

Alternative 3

None of the options within this alternative would affect existing peregrine falcon habitat. Project construction activities at the dams would not affect peregrines foraging in the area, but there is a chance that blasting associated with new trail construction to access the dams with pack stock could disturb foraging peregrines to some extent. Explosives used to provide rock for the rock crusher in Option B could disturb peregrine falcons nesting in the drainage if a nest was active at the time of the blasting. This is unlikely, both because construction activity would occur after the typical nesting season has ended, and because the Canyon Creek drainage does not appear to contain a peregrine eyrie. Increased recreational use caused by trail improvement and construction would be inconsequential to peregrine falcons.

Cumulative Effects

The analysis area for cumulative effects to peregrine falcons is Canyon Creek drainage. The existing condition reflects the sum of past activities. For peregrines, these are largely confined to shooting and the use of DDT, which were directly responsible for dramatic declines in peregrine

populations across the continent, and the subsequent reintroduction of captive-bred peregrines to formerly occupied habitat. Populations across the country have rebounded to the point that the species was removed from the Threatened and Endangered Species List in 2000.

The direct and indirect effects of all of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects. Reasonably foreseeable future projects in the Canyon Creek drainage include spraying herbicides along the roads and trails to control noxious weeds, and surfacing of parts of the Blodgett and Canyon Creek roads.

Effects Call

The effects call for peregrine falcons in the Biological Evaluation is May Impact Individuals or Habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. None of the alternatives would affect the viability of peregrine falcons at any scale.

Flammulated owl (*Otus flammeolus*)

Flammulated owls are associated with mature to old growth ponderosa pine/Douglas-fir forests in the Rocky Mountains. They are secondary cavity nesters and depend on woodpeckers for their nesting holes. This species is insectivorous and migratory, spending the winters in Mexico and Central America (Atkinson and Atkinson, 1990; Goggans, 1985).

Flammulated owls have been documented in several areas of the Forest, most of which are south of Darby. One flammulated owl was reported in the Blodgett Creek drainage in 1992. Some apparently suitable flammulated owl habitat occurs within the Canyon Creek drainage in some of the lower elevation mature and over-mature ponderosa pine and Douglas-fir stands on the south aspects. A graduate student from the University of Montana conducted flammulated owl surveys along the Canyon Creek Road, Canyon Creek Trail and the Blodgett Overlook Trail in 1994 and 1995 as part of the field work for her Master's degree, but detected no flammulated owls (Wright, 1996).

Direct and Indirect Effects

Alternative 1

The No Action Alternative would have no direct or indirect effects on flammulated owls or their habitat.

Alternative 2

None of the options within this alternative would affect existing flammulated owl habitat, which is restricted to the lower few miles of the trail.

Construction activities proposed at the dams under this alternative would not affect flammulated owls since the dams are not suitable habitat for this species. Helicopter flights to the dams would

have little effect on flammulated owls, which are almost strictly nocturnal. Workers or administrative personnel walking up the trail to the dams would not disturb flammulated owls any more than a hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to flammulated owls.

Alternative 3

This alternative could have a minor effect to flammulated owl habitat if trail improvements in the lower few miles of trail required felling of potential owl nest snags as hazard trees. Trail improvements in the upper part of the drainage near the lakes would be outside suitable habitat for this species.

Construction activities proposed at the dams under this alternative would not affect flammulated owls since the dams are not suitable habitat for this species. Helicopter flights to the dams would have little effect on flammulated owls, which are almost strictly nocturnal. Workers or administrative personnel walking up the trail to the dams would not disturb flammulated owls any more than a hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to flammulated owls. The proposed trail improvement and construction would likely lead to increased recreational use of the trail and the areas around Canyon and Wyant Lakes. Increased use of the trail to Canyon Lake could result in minor additional disturbance effects to flammulated owls in the future. Increased recreational use around the lakes would not affect this species because there is no suitable habitat in the immediate area.

Cumulative Effects

The analysis area for cumulative effects to flammulated owls is the Canyon Creek drainage. The existing condition reflects the sum of past activities. Major past activities in this area are described in the elk section.

The direct and indirect effects of all of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects. Reasonably foreseeable future projects in the Canyon Creek drainage include spraying herbicides along the roads and trails to control noxious weeds, and surfacing of parts of the Blodgett and Canyon Creek roads.

Effects Call

The effects call for flammulated owls in the Biological Evaluation is No Impact if Alternative A or B is selected, and May Impact Individuals or Habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species if Alternative C is selected. None of the alternatives would affect the viability of flammulated owls at any scale.

Black-backed woodpecker (*Picoides arctus*)

Black-backed woodpeckers are opportunistic feeders typically associated with mid to high elevation coniferous forests in the northern Rocky Mountains. This species is highly mobile and

tends to concentrate in areas of recent bark beetle irruptions, especially those following forest fires. Snag concentrations seem to be more critical for winter foraging than for summer foraging. Small flocks of black-backed woodpeckers often seen in snag patches in the winter seem to disperse during the summer, probably due to territoriality associated with nesting. Declines in population numbers of this species may be due to a relative scarcity of large areas of snags as fire suppression has become effective over the past 80 years (Hutto, 1992, pers. comm.).

This species may be present in low densities throughout the BNF, but becomes relatively common in some recently burned areas where most of the trees are dead. Large areas within the Canyon Creek drainage were burned during the Blodgett Trailhead fire in August of 2000. It is likely that black-backed woodpeckers have occupied some of these burned areas, although no surveys have been done in the area.

Direct and Indirect Effects

Alternative 1

The No Action Alternative would have no direct or indirect effects to black-backed woodpeckers.

Alternatives 2 and 3

Neither of these alternatives would affect existing black-backed woodpecker habitat, which is restricted to the recently burned area above the trail on the lower part of Romney Ridge.

Construction activities proposed at the dams under these alternatives would not affect black-backed woodpecker since the dams are not suitable habitat for this species. There is a small chance that the helicopter flights to the dams could potentially disturb black-backed woodpeckers to a minor degree. Workers or administrative personnel walking up the trail to the dams would not disturb black-backed woodpeckers any more than a hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to black-backed woodpeckers. The proposed trail improvement and construction would likely lead to increased recreational use of the trail and the areas around Canyon and Wyant Lakes. This increased use could result in minor additional disturbance effects to black-backed woodpeckers in the future.

Cumulative Effects

The analysis area for cumulative effects to black-backed woodpeckers is the Canyon Creek drainage. The existing condition reflects the sum of past activities. Major past activities in this area are described in the elk section.

The direct and indirect effects of all of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects. Reasonably foreseeable future projects in the Canyon Creek drainage include spraying herbicides along the roads and trails to control noxious weeds, and surfacing of parts of the Blodgett and Canyon Creek roads.

Effects Call

The effects call for black-backed woodpeckers in the Biological Evaluation is No Impact if Alternative A is chosen, and May Impact Individuals or Habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species if either Alternative B or C is chosen. None of the alternatives would affect the viability of black-backed woodpeckers at any scale.

Fisher (*Martes pennanti*)

Fisher in the northern Rocky Mountain area are associated with mature and overmature coniferous forests that have relatively closed canopies. Optimal habitat conditions include crown closures greater than 50 percent, average tree diameter greater than 10" and 2 or more canopy layers. Fisher use interspersed cover and edges of openings for foraging and are able to utilize early seral stages of vegetation more readily than martens. Fisher show a strong affinity for forested riparian areas throughout the year (Jones 1991).

Fisher depend on down woody material to provide subnivean dens in winter. Extensive fire or clearcutting may reduce habitat values especially during winter because lack of overhead cover permits greater snow depths. Uneven age timber management may improve habitat by increasing prey density and the number of den sites (Jones 1991, Douglas and Strickland, 1987). Important prey species include snowshoe hares, voles and pine squirrels. Prey availability and trapping pressure have the most effect on fisher abundance and density.

Fishers are occasionally sighted in many of the Bitterroot canyons, and it is likely that they occupy most of the canyon bottoms in the Bitterroots (Foresman, pers. comm. 2002). Suitable fisher habitat occurs along the entire length of Canyon Creek and on many of the north aspects. The presence of suitable habitat and known fisher populations in nearby drainages and over the Bitterroot Divide in Idaho makes it likely that fisher inhabit the Canyon Creek drainage, but no sightings have been reported.

Direct and Indirect Effects**Alternative 1**

The No Action Alternative would have no direct or indirect effects on fisher or their habitat.

Alternative 2

None of the options within this alternative would affect existing fisher habitat.

Construction activities proposed at the dams under this alternative would not affect fisher since the dams are not fisher habitat. Helicopter flights to the dams would have little effect on fisher, which are largely nocturnal. Workers or administrative personnel walking up the trail to the dams would not disturb fisher any more than a hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to fisher.

Alternative 3

None of the options within this alternative would affect existing fisher habitat.

Construction activities proposed at the dams under this alternative would not affect fisher since the dams are not fisher habitat. Helicopter flights to the dams would have little effect on fisher, which are largely nocturnal. The trail improvement and construction required to access the dams with pack stock, and to restore the trails to their original condition after the project has the potential to cause some disturbance to fisher in the area. Workers or administrative personnel walking up the trail to the dams would not disturb fisher any more than a hiking party. It is unlikely that this level of disturbance would have any lasting adverse effects to fisher. The proposed trail improvement and construction would likely lead to increased recreational use of the trail and the areas around Canyon and Wyant Lakes. This increased use could result in minor additional disturbance effects to fisher in the future.

Cumulative Effects

The analysis area for cumulative effects to fisher is the Canyon Creek drainage. The existing condition reflects the sum of past activities. Major past activities in this area are described in the elk section.

The direct and indirect effects of all of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects. Reasonably foreseeable future projects in the Canyon Creek drainage include spraying herbicides along the roads and trails to control noxious weeds, and surfacing of parts of the Blodgett and Canyon Creek roads.

Effects Call

The effects call for fisher in the Biological Evaluation is No Impact if Alternative A is selected, and May Impact Individuals or Habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species if either Alternative B or C is selected. None of the alternatives would affect the viability of fisher at any scale.

Wolverine (*Gulo gulo*)

The US Fish and Wildlife Service (USFWS) recently received a petition to list the wolverine as Threatened or Endangered throughout its range. The USFWS review process will take several years. In the interim, the wolverine has no legal status under the Endangered Species Act. However, the Regional Forester's Sensitive Species List includes the wolverine as a Sensitive species on the Bitterroot National Forest and throughout Region One.

Wolverine are solitary animals that range widely over a considerable variety of habitats. Habitat requirements tend to include large, isolated roadless areas that support a diverse prey base. Within such areas, wolverine use appears to be concentrated in areas of medium to scattered mature timber and in ecotonal areas around natural openings such as cliffs, slides, basins and

meadows. There seems to be little use in stands of dense young timber or in actual openings such as clearcuts or wet meadows (Reel, et al. 1989; Butts, 1992).

Wolverine home ranges are very large, averaging approximately 150 square miles in Montana. Wolverine feed primarily on rodents and carrion, although they are opportunists and will also consume berries, insects, fish, birds and eggs when available. Ungulate carrion seems to be particularly important in the winter, and wolverine movement to lower elevations during winter may be to take advantage of ungulate mortalities on winter ranges (Reel, et al. 1939; Butts, 1992). Ungulate carcasses attributable to wounding losses during hunting season also appear to be important food sources for wolverines during the winter at all elevations.

Recent sightings of wolverines in the Bitterroot Range include animals in Lost Horse, Camas and Sweathouse Creeks. Suitable wolverine denning habitat exists in the higher basins within the Canyon Creek drainage. Wolverine could also utilize the lower portions of the drainage during the winter. It is likely that some wolverine use occurs in the drainage, although the entire analysis area would constitute only a small portion of the home range of one wolverine.

Direct and Indirect Effects

Alternative 1

The No Action Alternative would have no direct or indirect effects on wolverine or their habitat.

Alternative 2

None of the options within this alternative would affect existing wolverine habitat or den sites. There is a small chance that construction activities and/or helicopter flights to the dams could potentially disturb wolverine to a minor degree if any happened to be in the area. Helicopter flights would not disturb wolverine dens since none would occur during the winter denning season. Workers or administrative personnel walking up the trail to the dams would not disturb wolverine any more than a hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to wolverine.

Alternative 3

None of the options within this alternative would affect existing wolverine habitat or known den sites.

There is a small chance that construction activities and/or helicopter flights to the dams could potentially disturb wolverine to a minor degree if any happened to be in the area. The trail improvement and construction required to access the dams with pack stock, and to restore the trails to their original condition after the project has the potential to cause some disturbance to wolverine in the area. Workers or administrative personnel walking up the trail to the dams would not disturb wolverine any more than a hiking party. It is unlikely that this level of disturbance would have any lasting adverse effects to wolverine. The proposed trail improvement and construction would likely lead to increased recreational use of the trail and the

areas around Canyon and Wyant Lakes. This increased use could result in minor additional disturbance effects to wolverine in the future.

Cumulative Effects

The analysis area for cumulative effects to wolverine is the Bitterroot Mountains. The existing condition reflects the sum of past activities. Major past activities in this area are described in the elk section. The direct and indirect effects of all of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects. Reasonably foreseeable future projects in the Bitterroot Mountains are listed in the Burned Area Recovery EIS (USDA Forest Service, 2001).

Effects Call

The effects call for wolverine in the Biological Evaluation is No Impact if Alternative A is selected, and May Impact Individuals or Habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species if either Alternative B or C is selected. None of the alternatives would affect the viability of wolverine at any scale.

Coeur d'Alene salamander (*Plethodon idahoensis*)

This small terrestrial salamander is generally found below 5,000 feet in elevation in seeps, spray zones and splash zones of waterfalls along streams and creeks. They occur in wet, humid and cool microhabitats containing fractured bedrock or large boulders that provide shelter and retain moisture. Dense tree canopy over cascading creek sites is an important habitat component because it moderates surface and water temperatures. These salamanders remain subsurface during the day. They hibernate underground from November to April. Removal of overstory vegetation, increases in water temperature, changes in water table and flow, and physical disturbance of talus or rock habitat can affect Coeur d'Alene salamander populations.

Recent surveys have documented Coeur d'Alene salamanders at three sites in the Bitterroot Range, including Sweathouse, Rock and Chaffin Creeks. The distance between these locations indicates that this species may be widespread in suitable habitat in the Bitterroots, although earlier surveys in other drainages did not detect any individuals (Genter, et al. 1998). There is some suitable habitat in Canyon Creek, and it is possible that this species occurs in the drainage.

Direct and Indirect Effects

Alternative 1

The No Action Alternative would have no direct or indirect effects on Coeur d'Alene salamanders or their habitat.

Alternative 2

All of the options within this alternative could affect existing Coeur d'Alene salamander habitat in Canyon Creek by altering water flows and/or by adding sediment to the creek during dam repair work. Most of these changes would be minor and temporary, and none would result in any lasting adverse effects to Coeur d'Alene salamanders. The potential for project activities to affect individual salamanders is limited because this species spends most of the day under large boulders or in interstitial spaces in fragmented bedrock. Other project activities such as helicopter flights would not affect this species.

Alternative 3

Effects to Coeur d'Alene salamanders would be similar to those described above under Alternative 2.

Cumulative Effects

The analysis area for cumulative effects to Coeur d'Alene salamanders is the Canyon Creek drainage. The existing condition reflects the sum of past activities. Major past activities in this area include construction of the dams on Canyon and Wyant Lakes that led to changes in water flow regimes, road construction and subdivision on private land lower in the drainage, and irrigation withdrawals that reduced flows in the lower parts of the stream. The direct and indirect effects of all of the alternatives are described above. Both of the action alternatives could temporarily add to past cumulative effects by altering flow regimes and/or increasing sedimentation rates. Reasonably foreseeable future projects in the Canyon Creek drainage include spraying herbicides along the roads and trails to control noxious weeds, and surfacing of parts of the Blodgett and Canyon Creek roads.

Effects Call

The effects call for Coeur d'Alene salamanders in the Biological Evaluation is No Impact if Alternative A is selected, and May Impact Individuals or Habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species if either Alternative B or C is selected. None of the alternatives would affect the viability of Coeur d'Alene salamanders at any scale.

Northern Goshawk (*Accipiter gentilis*)

Nesting habitat for goshawks is typically described in the scientific literature as mature to over-mature forest with a canopy closure exceeding 60 percent and tree stem density exceeding 195 trees/acre (Reynolds, et al. 1982). Most of the goshawk nests we have located on the BNF over the last few years are in stands that are younger and considerably more open. Nests on the BNF tend to be at low to mid elevations, often in Douglas-fir habitat types on cooler aspects. Goshawks occupy large territories, and are generalists when it comes to foraging habitat, but natural and/or created openings are usually present within the forest matrix.

A goshawk nest along the Blodgett Overlook Trail was occupied during the summers of 1997 and 1998, but was destroyed by the Blodgett Trailhead fire in 2000. We have not been able to locate other goshawk nests in the drainage, but it is possible that one or more exist.

Direct and Indirect Effects

Alternative 1

The No Action Alternative would have no direct or indirect effects on goshawks or their habitat.

Alternative 2

None of the options within this alternative would affect existing goshawk habitat, which is restricted to the forested areas along the trail below the lakes.

Construction activities proposed at the dams under this alternative would not affect goshawks since the dams are not suitable habitat for this species. Helicopter flights to the dams would not disturb nesting goshawks because the flights would be high above the canopy. Workers or administrative personnel walking up the trail to the dams could disturb goshawks if a nest was located near the trail, but any such disturbance would be similar to that caused by any other hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to goshawks.

Alternative 3

This alternative could potentially result in enough disturbance to cause goshawks to abandon an active nest if trail improvement activities in the lower few miles of trail were concentrated near a nest in April, May or June. Trail improvements in the upper part of the drainage near the lakes would be outside suitable habitat for this species.

Construction activities proposed at the dams under this alternative would not affect goshawks since the dams are not suitable habitat for this species. Helicopter flights to the dams would not disturb nesting goshawks because the flights would be high above the canopy. Workers or administrative personnel walking up the trail to the dams could disturb goshawks if a nest was located near the trail, but any such disturbance would be similar to that caused by any other hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to goshawks. The proposed trail improvement and construction would likely lead to increased recreational use of the trail and the areas around Canyon and Wyant Lakes. Increased use of the trail to Canyon Lake could result in minor additional disturbance effects to goshawks in the future. Increased recreational use around the lakes would not affect this species because there is no suitable habitat in the immediate area.

Cumulative Effects

The analysis area for cumulative effects to goshawks is the area between Blodgett and Owings Creeks, since this area probably encompasses the territory limits of a pair nesting in the Canyon

Creek drainage. The existing condition reflects the sum of past activities. Major past activities in this area are described in the elk section.

The direct and indirect effects of all of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects. Reasonably foreseeable future projects in the Canyon Creek drainage include spraying herbicides along the roads and trails to control noxious weeds, and surfacing of parts of the Blodgett and Canyon Creek roads

Effects Call

The effects call for goshawks in the Biological Evaluation is No Impact if either Alternative A or B is selected, and May Impact Individuals or Habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species if either Alternative B or C is selected. None of the alternatives would affect the viability of goshawks at any scale.

Boreal (or Western) Toad (*Bufo boreas*)

Boreal toads are habitat generalists that occupy a wide variety of habitats as adults. Eggs are laid in slow-moving streams, ponds and even tire ruts in moister areas that stay wet most of the year. Toads are well distributed across the Forest, and probably occur within the Canyon Creek drainage.

Direct and Indirect Effects

Alternative 1

The No Action Alternative would have no direct or indirect effects on toads or their habitat.

Alternative 2

All of the options within this alternative could affect existing boreal toad habitat in Canyon Creek by altering water flows and/or by adding sediment to the creek during dam repair work. Most of these changes would be minor and temporary, and none would result in any lasting adverse effects to boreal toads. The potential for construction activities to affect adult toads is limited because adults are scattered across the Forest in a variety of habitats in the fall, and are unlikely to be affected by activities limited to the trail and dam areas or by sediment increases in Canyon Creek. Changes in water flow and sediment increases could affect reproductive success if toads breed in East Lake downstream of the dams. Other project activities such as helicopter flights would not affect this species.

Alternative 3

Effects to boreal toads would be similar to those described above under Alternative 2, except that trail reconstruction activities have some additional potential to affect individual toads or their habitat to a minor degree. The proposed trail improvement and construction would likely lead to

increased recreational use of the trail and the areas around Canyon and Wyant Lakes. This increased use could result in minor additional disturbance effects to toads in the future.

Cumulative Effects

The analysis area for cumulative effects to boreal toads is the Canyon Creek drainage. The existing condition reflects the sum of past activities. Major past activities in this area include construction of the dams on Canyon and Wyant Lakes that led to changes in water flow regimes, road construction and subdivision on private land lower in the drainage, and irrigation withdrawals that reduced flows in the lower parts of the stream. The direct and indirect effects of all of the alternatives are described above. Both of the action alternatives could temporarily add to past cumulative effects by altering flow regimes and/or increasing sedimentation rates. Reasonably foreseeable future projects in the Canyon Creek drainage include spraying herbicides along the roads and trails to control noxious weeds, and surfacing of parts of the Blodgett and Canyon Creek roads.

Effects Call

The effects call for boreal toads in the Biological Evaluation is No Impact if Alternative A is selected, and May Impact Individuals or Habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species if either Alternative B or C is selected. None of the alternatives would affect the viability of boreal toads at any scale.

Consistency with the Bitterroot Forest Plan and Other Regulatory Direction

All alternatives meet Forest Plan standards (FP II-21) and FSM direction for management of sensitive wildlife species.

Other Wildlife Species

Mountain Goat (*Oreamnos americanus*)

Good mountain goat habitat is widespread along the steep, rocky canyon walls in the Canyon Creek drainage. A small herd of mountain goats winters in lower portions of the drainage and uses some of the high elevation basins and cliffs as summer range. The majority of goat use occurs on the open, south facing aspects. Ground-based human activity can disturb goats in hunted populations such as that in the Bitterroots, but they seem to be much more disturbed by aircraft flying low overhead (Nielsen 1995, pers. comm.).

Direct and Indirect Effects

Alternative 1

The No Action Alternative would have no direct or indirect effects on goats or goat habitat.

Alternative 2

None of the options within this alternative would affect goat habitat, although goats sometimes lounge on the tops of some of the wilderness dams in the Bitterroot Mountains.

Helicopter flights to the dams could potentially cause severe disturbance to goats if the helicopter passed low over the goats, and especially if it hovered over them. Mitigations requiring helicopter pilots to avoid goats would greatly reduce the chances of such disturbance.

Minor disturbance to goats could occur as a result of the construction activities proposed at the dams under this alternative, especially if they included blasting. Workers or administrative personnel walking up the trail to the dams would not disturb goats any more than a hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to goats.

Alternative 3

This alternative would be similar to Alternative 2 with regards to affects to goat habitat and disturbance to goats resulting from construction activities at the dam, helicopter flights and access up the trail. The trail improvement and construction required to access the dams with pack stock, and to restore the trails to their original condition after the project has the potential to cause longer lasting, more severe disturbance to goats in the area. Even with this level of disturbance, the most likely response from goats would be to move away from the disturbance, possibly to another drainage. There would be no lasting adverse effects to goats. The proposed trail improvement and construction would likely lead to increased recreational use of the trail and the areas around Canyon and Wyant Lakes. This increased use could result in minor additional disturbance effects to goats in the future.

Cumulative Effects

The analysis area for cumulative effects to goats is the Canyon Creek drainage. The existing condition reflects the sum of past activities. Major past activities include construction of the trails and the Forest road system which increased human access to the area and resulted in increased hunting season mortality, and the advent of successful fire suppression which resulted in more cover and less forage habitat than was present historically. This is especially prevalent on the lower, south slopes in the canyons that the goats use for winter range. Much of the forest on the lower part of Romney Ridge was killed by high-intensity fire during the Blodgett Trailhead fire in 2000. Most of the area is wilderness or unroaded, so only limited management activities have occurred.

The direct and indirect effects of all of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects. Reasonably foreseeable future projects in this area include spraying herbicides along the roads and trails to control noxious weeds and surfacing of parts of the Blodgett and Canyon Creek roads.

None of the alternatives would affect the viability of mountain goats at any scale.

Consistency with the Bitterroot Forest Plan and Other Regulatory Direction

The Forest Plan does not contain any goals, objectives or standards pertaining directly to mountain goats.