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Draft Environmental Assessment for the Delta River Special Recreation Management Area Plan and East Alaska Resource Management Plan Amendment

Photo by Thomas Kloster, American Hiking Society Volunteer, August 2008

BLM

Glennallen Field Office

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Draft Environmental Assessment for the Delta River Special Recreation Management Area Plan and East Alaska Resource Management Plan Amendment

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Table of Contents

1.0 INTRODUCTION 1

1.1 Document Structure 1

1.2 Background 1

1.3 Planning Area 2

1.4 Purpose and Need for Action 4

1.5 Decisions to be Made 4

1.6 Scope of the Analysis and Planning Criteria 5

1.7 Relationship to Laws, Regulations, Statutes, and other Policies 6

1.8 Public Involvement 7

1.9 Issues 8

2.0 PROPOSED ACTION AND ALTERNATIVES 10

2.1 Alternative Formulation and Description 10

2.2 Management Actions Common to Alternatives 2, 3, and 4 10

2.3 Alternative 1 -- No Action Alternative 13

2.4 Alternative 2 -- Proposed Action Alternative 13

2.5 Alternative 3 40

2.6 Alternative 4 45

3.0 AFFECTED ENVIRONMENT 49

3.1 River Corridor Description and General Setting 49

3.2 Affected Resources and Issues for Analysis 49

3.2.1 Climate Change 49

3.2.2 Cultural Resources 50

3.2.3 Fisheries 51

3.2.4 Lands and Realty 53

3.2.5 Natural Quiet and Natural Sounds 54

3.2.6 Recreation Resources 55

3.2.7 Scenic Resources 65

3.2.8 Soil Resources 66

3.2.9 Subsistence 66

3.2.10 Travel Management 67

3.2.11 Vegetation 75

3.2.12 Water Quality 76

3.2.13 Wilderness Characteristics 77

3.2.14 Wildlife 77

4.0 ENVIRONMENTAL IMPACTS 79

4.1 Introduction 79

4.2 Direct and Indirect Impacts 79

4.2.1 Climate Change 79

4.2.2 Cultural Resources 79

4.2.3 Fisheries 81

4.2.4 Lands and Realty 83

4.2.5 Natural Quiet and Natural Sounds 84

4.2.6 Recreation Resources: Facilities and Visitor Management 84

4.2.7 Scenic Resources 89

4.2.8 Soil Resources 91

4.2.9 Subsistence 92

4.2.10 Travel Management 92

4.2.11 Vegetation 94
4.2.12 Water Quality 96
4.2.13 Wilderness Characteristics 98
4.2.14 Wildlife 98
4.3 Cumulative Impacts 100
4.3.1 Cumulative Impact Area (CIA) and Reasonably Foreseeable Future Actions (RFFA) 100
4.3.2 Cumulative Impacts Analysis 101
4.3.2.1 Cultural Resources 101
4.3.2.2 Fisheries 101
4.3.2.3 Recreation Resources 102
4.3.2.4 Scenic Resources 102
4.3.2.5 Travel Management 103
4.3.2.6 Vegetation 103
4.3.2.7 Water Quality 103
5.0 CONSULTATION AND COORDINATION 104
6.0 BIBLIOGRAPHY 105
7.0 APPENDICES 107
7.1 Benefits Based Recreation Management 107
7.2 ANILCA §810 Evaluations and Findings for All Alternatives 112

1.0 INTRODUCTION

1.1 Document Structure

The Bureau of Land Management (BLM) has prepared an Environmental Assessment (EA) for the Delta River Special Recreation Management Area (SRMA) Plan and associated East Alaska Resource Management Plan (EARMP) Amendment. The EA will propose alternative management strategies for the river corridor and discloses the potential environmental impacts that would result from the alternatives. The EA is intended to facilitate decision making based on an understanding of the environmental consequences of the alternatives, and is used to determine whether the preparation of an environmental impact statement is required. Decisions made in this planning process will be incorporated into a subsequent revision of the 1983 Delta Wild and Scenic River (DWSR) Management Plan. The EA contains the following sections:

- ***Introduction:*** Includes information on the history of the project proposal, the purpose and need for the project, issues identified from public and internal scoping, and decisions that will be made for achieving the purpose and need.
- ***Proposed Action and Alternatives:*** Provides a description of current management, BLM's proposed action for future management, as well as alternative methods for achieving the stated purpose.
- ***Affected Environment:*** Describes the existing natural environment and provides information regarding recreational use trends and visitor use within the DWSR corridor.
- ***Environmental Impacts:*** Describes the environmental effects of implementing the proposed action and other alternatives; organized by issues identified during public and internal scoping.
- ***Consultation and Coordination:*** Provides a list of preparers and agencies consulted during the development of the EA.
- ***Bibliography:*** Contains references to documents used in the preparation of the EA.
- ***Appendices:*** Provides more detailed information to support the analysis presented in the EA.

1.2 Background

The Alaska National Interest Lands Conservation Act (ANILCA, P.L. 96-487, Sec. 603(47) December 2, 1980) established the upper stretch of the Delta River and all of the Tangle Lakes and Tangle River as a component of the Wild and Scenic Rivers System, to be administered by the Secretary of the Interior through the BLM. Subject to valid existing rights, ANILCA classified and designated approximately 18 miles of the Delta River as a "recreational" river and approximately 20 miles as a "wild" river pursuant to the Wild and Scenic Rivers Act (WSRA. P.L. 90-542). ANILCA also designated, but did not classify, 24 miles of the Tangle Lakes and Tangle River as a component of this system. The classification of these additional 24 miles as "scenic" was done in the original 1983 DWSR Management Plan.

By classifying various segments of the DWSR as either "wild", "scenic", or "recreational", Congress mandated that these segments be administered according to the following objectives in Section 2 (b) of the WSRA:

Wild: "Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America."

Scenic: "Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads."

Recreational: "Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past."

ANILCA Sec. 605 (d) directed the Secretary of the Interior to establish detailed boundaries, prepare a management plan, and present this information to Congress by December 2, 1983. In response to these

directives, BLM developed the 1983 DWSR Management Plan, which established detailed boundaries and developed general management policies for the DWSR corridor.

Since 1983, BLM has managed the DWSR corridor consistent with the WSRA, ANILCA, and the 1983 DWSR Management Plan. Management efforts have focused on monitoring use levels and visitor impacts within the river corridor and developing strategies to mitigate visitor impacts. Registration boards at boat launches, random river user surveys and river corridor overflights have been used to document visitation levels and user trends. BLM patrols the river at least three times per year, picking up litter, burying or disposing of human waste, inventorying and monitoring campsite impacts, and making public contacts to provide information regarding low impact camping, rules and regulations. A detailed inventory of river surveys, campsite monitoring documentation, overflight history, and public comments has allowed BLM to track visitor use trends and to identify impact issues that have developed within the river corridor since the completion of the original 1983 DWSR Management Plan.

1.3 Planning Area

The DWSR is one of a few road-accessible rivers in the state of Alaska, and less than a 6 hour drive from Fairbanks (pop. 83,000) and Anchorage (pop. 260,000). Access to the Delta River is along the Denali Highway, approximately 21 miles west of Paxson and the Richardson Highway, or 114 miles east from Cantwell and the Parks Highway. Lands within the DWSR corridor are primarily unencumbered BLM lands, except for a few private inholdings and a portion of the river corridor that has been determined to be a navigable waterway, managed by the State of Alaska. The DWSR corridor shares the same boundary as the Delta River SRMA.

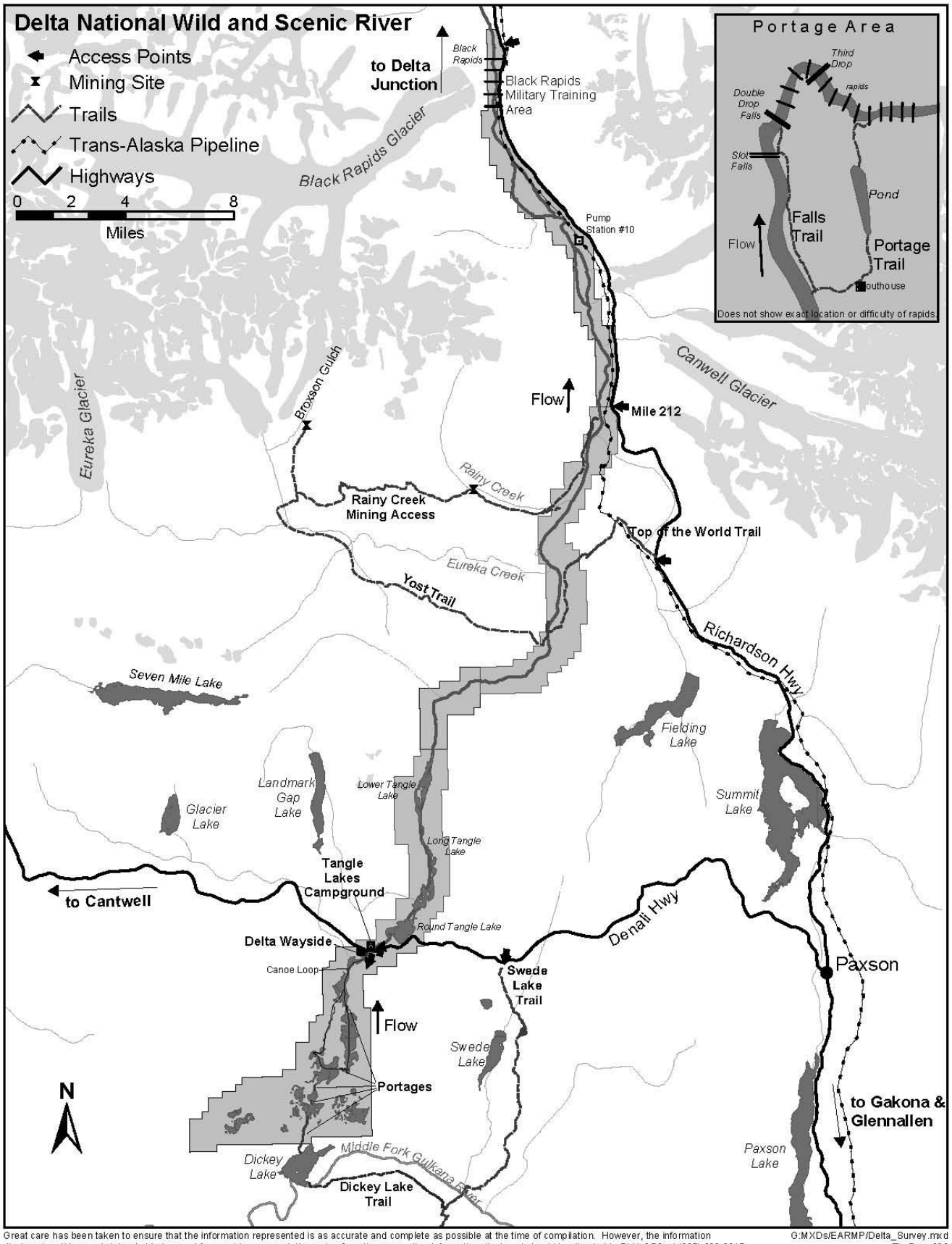
A navigability determination for the DWSR corridor was completed by BLM in February 2010, and most of the DWSR corridor was determined to be non-navigable, except for a portion of the lower river located between the confluences of Garrett Creek and Phelan Creek. This navigable section within the river corridor falls under state jurisdiction, below the ordinary high water marks. BLM acknowledges the State of Alaska's authority to manage between the ordinary high water marks within this section, which includes the water column and most unvegetated beaches and gravel bars. The final BLM navigability determination is included in the administrative record located at the Glennallen Field Office.

Table 1: Total Acreage and Acreages by Wild and Scenic River (WSR) Classification

Total Acreage* and Acreages by WSR Classification	Acres
Total Acreage*	44617
Private Inholdings	30
Wild Classification	12352
Scenic Classification	23892
Recreational Classification	8343

* In navigable portions of the river, lands that are located between the ordinary high water marks (including the bed and banks) are owned by the State of Alaska.

Map 1: Delta Wild and Scenic River Vicinity Map



Great care has been taken to ensure that the information represented is as accurate and complete as possible at the time of compilation. However, the information displayed on this map is intended to be used for graphic representation only. Questions regarding information displayed should be directed to BLM GFO at (907) 822-3217.

G:MXDs/EARMP/Delta_Survey.mxd
TL Dec. 2004

1.4 Purpose and Need for Action

On September 7, 2007, the Record of Decision was signed for the East Alaska Resource Management Plan (EARMP). The EARMP is a comprehensive land use plan that guides management activities on all BLM managed lands within the Glennallen Field Office boundaries. After the completion of the EARMP in 2007, it was determined that the 1983 DWSR Management Plan needed to be updated to reflect recent decisions that were made in the EARMP, and to address current and future issues in the river corridor that had developed since 1983.

The EARMP designated the DWSR corridor as a Special Recreation Management Area (SRMA). This SRMA designation requires the completion of an implementation plan that describes specific recreation management actions within the planning area. Subsequent to the development of the EARMP, BLM developed new recreation land use planning requirements (following the Benefits Based Management (BBM) process) that were not included in the EARMP. This new guidance requires specific recreation-related land use allocations and the development of recreation management zones (RMZ) for each SRMA. Although the EARMP did identify four RMZs within the Delta River SRMA, further review and study has shown that an additional RMZ and associated RMZ boundary changes may be necessary to reflect current recreational use patterns. Therefore, as part of developing the SRMA plan, the EARMP must be amended to make these decisions.

The original 1983 DWSR Management Plan developed management objectives for the river corridor and recognized that Sections 1(b) and 10(a) of the WSRA mandate that a wild and scenic river be administered to protect and enhance certain “outstandingly remarkable values” that were the basis for the original designation. However, the 1983 DWSR Management Plan did not clearly identify and define the outstandingly remarkable values (ORVs). As part of this planning process, ORVs will be clearly identified and a management strategy will be developed to enhance and protect the ORVs. This will help to ensure that current and future activities within the river corridor are compatible with, and do not negatively affect, the identified ORVs for the DWSR corridor.

New decisions that will be made as part of the Delta River SRMA Plan and EARMP Amendment will be analyzed in this EA. These decisions will apply to recreation management and only for BLM managed lands within the DWSR corridor and Delta River SRMA. Recreational decisions made in this plan will be incorporated into a subsequent revision of the 1983 DWSR Management Plan. Decisions made in the EARMP for other resources within the planning area will not be changed and will also be incorporated into the revised DWSR Management Plan.

1.5 Decisions to be Made

BLM will identify numerous decisions during the development of the SRMA Plan and LUP Amendment in accordance with Land Use Planning Guidance (BLM LUP H 1601-1, Appendix C), SRMA Planning Guidance (BLM LUP H 1601-1, Appendix C), and WSR Planning Guidance (BLM M-8351). Decisions to be made are described below:

For BLM lands within the DWSR corridor, implementation decisions will:

- Identify ORVs and associated management objectives for the DWSR corridor.
- Develop management actions that will be the basis for the creation of Special Rules for the river corridor in accordance with 43 CFR 8351.2-1.
- Develop management decisions for off highway vehicle (OHV) use, including the closure of unauthorized OHV routes not designated in the EARMP, establish weight limitations for OHV use, and develop OHV trail management and maintenance prescriptions.
- Designate nonmotorized trails and establish associated management and maintenance prescriptions for nonmotorized trails.
- Develop management decisions for airplane landings and the potential for new airstrip construction.
- Develop management decisions for motorized boating use.
- Establish decisions to manage private and commercial use as directed in WSR planning guidance; including group size, length of stay, and user capacity.
- Establish limitations on chainsaw use, fireworks, caching of supplies and recreational shooting.

- Prescribe the level and scope of future facility developments, including potential property acquisition opportunities.
- Guide the development of interpretative and educational materials while focusing marketing efforts to specific recreational activities.
- Prescribe adaptive management actions to address issues associated with litter, human waste, fire rings, campsite impacts, and visitor use limitations.
- Prescribe monitoring actions to ensure that management objectives are being achieved.

For BLM lands within the DWSR corridor, LUP Amendment decisions will:

- Apply recreation planning guidance as directed in the BLM LUP Handbook 1601-1, Appendix C.
- Identify Recreation Management Zones (RMZ) and corresponding recreation niches within each RMZ.
- Develop recreation management objectives for the specific recreation opportunities to be produced and the outcomes to be attained (activities, experiences and benefits).
- Prescribe recreation setting character conditions required to produce recreation opportunities and facilitate the attainment of both recreation experiences and beneficial outcomes.
- Describe an activity planning framework that addresses recreation management, marketing, monitoring, and administrative support actions (e.g., visitor services, permits and fees, and appropriate use restrictions) necessary to achieve stated recreation management objectives and setting prescriptions.

1.6 Scope of the Analysis and Planning Criteria

During the scoping process, the BLM identified the following preliminary planning criteria to guide the LUP Amendment:

1. The plan amendment will be consistent with the standards and guidance set forth in the Federal Land Policy and Management Act, the National Environmental Policy Act, the Council on Environmental Quality's implementing regulations, the National Historic Preservation Act, the Wild and Scenic Rivers Act, the Migratory Bird Treaty Act, the Alaska National Interest Lands Conservation Act (ANILCA), and other Federal laws, regulations, and policies as required;
2. the plan amendment will comply with Section 810 of ANILCA, as well as other subsistence and land use decisions;
3. the plan amendment will recognize valid existing rights;
4. the plan amendment will only affect the public lands managed by the BLM in the Delta River Special Recreation Management Area (as defined in the EARMP);
5. the BLM will work cooperatively with the State and other Federal agencies, Native corporations, Tribes, and Municipal governments. Collectively, these entities have additional jurisdiction by law or special expertise;
6. public participation by interested groups and individuals will be encouraged throughout the planning process;
7. wildlife habitat management will be consistent with Federal and Alaska Department of Fish and Game (ADF&G) objectives and mandates;
8. any OHV trail designations within the planning area will be completed in accordance with ANILCA Sections 810, 811, and 1110, Department of Interior regulations at 43 CFR 36.11 and 43 CFR 8342, and applicable state law;
9. the BLM will make all possible attempts to ensure that its management prescriptions and planning actions complement other plans and planning efforts in the area;
10. the BLM will, to the extent possible, use current scientific information, research, new technologies and the results of resource assessments, monitoring and coordination to determine appropriate management strategies that will enhance resource values;
11. the plan amendment and associated implementation plans prepared by the BLM will conform to the Bureau of Land Management H-1601-1 Land Use Planning Handbook: "Appendix C, Program-Specific and Resource-Specific Decision Guidance and Supplemental Program Guidance Manual for Recreation and Visitor Services"; and
12. the plan amendment will only address recreation management and will supersede only those sections of the existing EARMP that relate to management of the Delta River SRMA. The plan will conform to all other decisions made in the EARMP.

1.7 Relationship to Laws, Regulations, Statutes, and other Policies

The EARMP and the Federal Land Policy and Management Act of 1976 (FLPMA) provide the overall long-term management direction for the Glennallen Field Office. FLPMA is the primary authority for the BLM's management of public lands. It provides overarching policy by which BLM public lands will be managed and establishes provisions for land use planning, land acquisition and disposition, administration, land use authorizations, designated management areas, and the repeal of certain laws. In particular, Sec. 202 (a) requires the Secretary of the Interior, with public involvement; to develop, maintain, and when appropriate, revise land use plans. Management actions identified in this EA are consistent with the goals and decisions identified in the EARMP:

> EARMP Recreation Goal M-1: Manage recreation to maintain a diversity of recreational opportunities. (Approved RMP, page 34)
>
> EARMP Recreation Allocation M-2: Delta Wild and Scenic River Corridor Area: Objectives are to maintain existing recreation opportunities with an emphasis on managing for a primitive experience in the portion of the WSR Corridor classified as "wild;" managing to protect VRM Class 1 viewshed; OHVs would be restricted to the two designated trails (Top of the World, Rainy Creek) from May 15 to October 16 or when there is less than an average of 12 inches of snow or 6 inches frost; snowmachine use will not be limited; recommend limitations on motorized use on the Tangle Lakes; no public use cabins will be considered; general visitor use and commercial use limits will be established in implementation-level planning; the Tangle Lakes Campground will be renovated; the river take-out at mile 212 on the Richardson Highway would have increased signage; acquisition of one of the area lodges may be considered. (Approved RMP, page 35)
>
> EARMP Implementation Planning M-4: Implementation plans will be done for each SRMA. These plans will describe specific objectives for each area, based on the objectives outlined above as well as benefits-based analysis conducted for each area. Implementation plans will include travel management and describe specific trail limitations and designations. Implementation plans will include facility maintenance and construction plans, based on guidance described above. Implementation plans, where necessary and as described above, will determine general visitor use or commercial limits. These will be based on achievement of SRMA objectives. If necessary, assessment of visitor recreation experiences, tolerance for impacts, and benefits will be conducted through user surveys or benefits-based analysis. (Approved RMP, page 39)
>
> EARMP Monitoring M-5: Monitoring of recreation resources will continue to occur throughout the planning area with emphasis placed on developed recreation sites and SRMAs. Monitoring will include regular patrols to check on signing, visitor use, recreation use-related impacts, and user conflicts. Monitoring on the Delta Wild and Scenic River will be described in the revised river management plan for the river. Monitoring will include litter, human waste, fire rings, camp encounters, campsite condition and trend, water quality, visitor use and commercial permits. (Approved RMP, pages 39-40)

In addition to FLPMA and the EARMP, the BLM must follow other laws, regulations, and statutes as appropriate:

1.7.1 National Environmental Policy Act of 1969 (NEPA)

The National Environmental Policy Act of 1969 requires that the BLM analyze the environmental effects of activities it authorizes on the public lands to determine whether they will have a significant effect on the quality of the human environment, 42 U.S.C. §4332. Management direction for BLM NEPA compliance is found in the BLM Land Use Planning Handbook H-1601-1 and the BLM NEPA Handbook H-1790-1.

1.7.2 Wild and Scenic Rivers Act of 1968 (WSRA)

The management of the DWSR corridor must be consistent with the WSRA. The WSRA created the Wild and Scenic Rivers System (WSRS) and established a framework that provides federal protection for certain free-flowing rivers, with the intent of preserving these rivers as free-flowing and managing their immediate environments in such a manner as to protect and enhance the outstandingly remarkable

values that were the basis for their inclusion in the WSRS. The WSRA provides guidance for developing and implementing any proposed management actions within the river corridor. Interpretation and management direction of the WSRA for BLM is provided through the Wild and Scenic Rivers—Policy and Program Direction for Identification, Evaluation, and Management Manual (1993, BLM M-8351).

1.7.3 Alaska National Interest Lands Conservation Act of 1980 (ANILCA)

ANILCA established the Delta River as a Conservation System Unit (CSU) and as a component of the Wild and Scenic Rivers System. ANILCA provides specific guidance for management issues that are unique to Alaska, including subsistence and access. BLM is required by ANILCA, Section 810 to consider any potential impacts to subsistence activities, resources, or impacts to access for subsistence activities from the proposed action and alternatives. These impacts are discussed in a Section 810 Evaluation Report. The complete Section 810 Evaluation Report for this plan can be found in Appendix 7.2. Title XI of ANILCA outlines specific procedural requirements to authorize new transportation and utility systems within CSUs. Title XI also permits special access considerations for traditional activities and access to inholdings. Regulations for access in CSUs (under Title XI) are in 43 CFR 36.11(h).

1.8 Public Involvement

A Notice of Intent to initiate the planning process was published in the *Federal Register* on April 10, 2008. This marked the beginning of the scoping process for the planning effort. As part of scoping, BLM identified preliminary issues and planning criteria that were published in the *Federal Register* Notice of Intent. A letter and scoping bulletin was sent to more than 1,300 parties on the Glennallen Field Office contact list, comprised of individuals, local and national organizations, tribes, villages, and native corporations, and state and federal agencies who had expressed interest in the Delta River planning process or BLM-Alaska planning efforts. The scoping bulletin was also posted on the BLM website and publicized through local venues including the Copper River Record, Delta Wind, and the statewide "What's Up" list serve. Public service announcements aired over KCHU, KDHS and KCAM.

Scoping comments were accepted for 60 days, beginning July 15, 2008 and ending on September 15, 2008. A total of twenty comments were received during the scoping period. After analysis of these comments, a scoping report and comments table were prepared and are available on the Delta River planning website at http://www.blm.gov/ak/st/en/prog/nlcs/delta_nwsr/Delta_River_Planning.html.

In addition to public scoping associated with the EA and NEPA requirements, BLM has also conducted focus group meetings and administered a recreational river survey to prepare for the planning process.

1.8.1 Benefits Based Management (BBM) Planning

Traditional approaches to recreational planning have focused on developing and maintaining recreational opportunities and facilities by providing programs, services, and implementing use restrictions. Users gain certain benefits or outcomes from these experiences, but are disconnected from the planning process. BBM is a new approach that identifies the primary activities, experiences, and benefits through an interactive process with focus groups and stakeholders who have a vested interest in the area. After these values are identified, specific setting prescriptions and implementation actions are prescribed for Recreation Management Zones (RMZ) to enhance or maintain the identified outcomes (activities, experiences, and benefits). Additional information on the BBM planning process can be found in Appendix 7.1.

The Glennallen Field Office conducted a series of focus group meetings in February 2007 during the BBM planning process. Discussion at these meetings focused on how people used the area, their primary purpose for using the area, and their opinions on desired future conditions and management options for the area. Stakeholders included representatives from local subsistence user and hunting groups, motorized access groups, environmental and conservation groups, Native tribes and corporations, and other state and federal agencies. Seven meetings were held and a total of 78 people attended. Notes from these meetings are included in the administrative record located at the Glennallen Field Office.

1.8.2 Delta River Recreation User Survey

To prepare for the revision of the river management plan, a river recreation survey was developed and administered by Research Confluence and Consulting of Anchorage, Alaska in 2005 as a method of obtaining river users' opinions on a variety of issues, management actions, and preferences within the DWSR corridor. The overall study objectives were to describe the current users on the Delta River, examine the impacts they experience on their trips and their tolerances for those impacts, and to assess the public acceptability of management actions that might be used to address impacts or conflict problems. A summary of results from the 2005 Delta River Recreation Survey is included in the administrative record located at the Glennallen Field Office.

1.9 Issues

Issues have been identified that will help guide the formation of the alternatives for the NEPA process. Issues were identified based on an evaluation of the 1983 DWSR Management Plan, public input from the 2005 Delta River Recreation User Survey, BBM planning meetings that were conducted in February 2007, internal BLM concerns, and comments received during the scoping process. The following issues have been identified for analysis:

1.9.1 Climate Change

- Effects of recreation management decisions to contributing causes of climate change within the DWSR corridor.

1.9.2 Cultural Resources

- Effects to cultural resources from recreational facility development and campsite management decisions.
- Effects to cultural resources from OHV management decisions.
- Effects to cultural resources from identifying ORVs.

1.9.3 Fisheries

- Effects to fisheries habitat from OHV trails and OHV river crossings.
- Effects to fisheries habitat from motorized boating decisions.
- Effects to fisheries resources from identifying ORVs.

1.9.4 Lands and Realty

- Effects of recreation decisions on access to State lands, private land parcels, and mining operations that are located adjacent to the DWSR corridor.
- Effects of potential property acquisition by BLM in the DWSR corridor.

1.9.5 Natural Quiet and Natural Sounds

- Effects of recreation decisions on natural quiet and natural sounds present within the DWSR corridor.

1.9.6 Recreation Resources: Facilities and Visitor Management

- Effects of proposed recreational facility developments on the natural and primitive character of the DWSR.
- Effects of the proposed user capacity management decisions on a user's ability to have positive recreational experiences within the DWSR corridor.
- Effects of proposed recreation management decisions regarding litter, human waste, fire rings, and educational/interpretational information on a user's ability to have positive recreational experiences within the DWSR corridor.
- Effects of proposed BBM decisions on preserving a diversity of recreational experiences within the DWSR corridor.

- Effects to recreation resources from identifying ORVs.

1.9.7 Scenic Resources

- Effects of proposed recreational facility developments on scenic resources.
- Effects of travel management decisions on scenic resources.
- Effects to scenic resources from identifying ORVs.

1.9.8 Soil Resources

- Effects of OHV management decisions on soil resources.
- Effects of campsite management decisions on soil resources.

1.9.9 Subsistence

- Effects of the proposed recreation management decisions to subsistence use of fish and wildlife in the DWSR corridor.

1.9.10 Travel Management

- Effects of travel management decisions on the natural and primitive character of the DWSR corridor and on preserving a diversity of recreational experiences.

1.9.11 Vegetation

- Effects of OHV management decisions on vegetative resources.
- Effects of campsite management decisions on vegetative resources.
- Effects of decisions regarding the use of firewood gathering on vegetative resources.

1.9.12 Water Quality

- Effects to water quality from potential contaminants as a result of motorized boating and human waste disposal decisions.
- Effects to water quality from potential sedimentation sources including designated campsites, OHV trails and OHV river crossings.

1.9.13 Wilderness Characteristics

- Effects of management actions on wilderness characteristics, including naturalness, solitude, and primitive and unconfined recreational opportunities that are found within the DWSR corridor.

1.9.14 Wildlife

- Effects of OHV travel management decisions to moose and caribou.
- Effects of motorized boating and airplane landing decisions to land birds and waterfowl.
- Effects of recreation decisions on human and bear interactions.
- Effects to wildlife resources from identifying ORVs.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 Alternative Formulation and Description

Alternatives were developed to address the range of issues that were discussed in Chapter 1. Alternative 1 is the No Action Alternative. The No Action Alternative provides a baseline for comparison with the other alternatives, and describes the current management scenario. Alternative 2 is the proposed action. This alternative balances resource uses with resource protection, while still providing for high quality recreational experiences. Alternative 3 provides management for high density experiences, and emphasizes recreation facility development and increased maintenance to address higher impact levels. Alternative 4 provides management for low density experiences, requiring more restrictions on use or types of recreation behavior.

2.2 Management Actions Common to Alternatives 2, 3, and 4

2.2.1 Outstandingly Remarkable Values (ORV) and Management Objectives

The ORVs and associated management objectives described below will not change in any of the alternatives. Management guidance for the establishment of ORVs can be found in Section 1(b) of the WSRA and in the BLM Wild and Scenic Rivers—Policy and Program Direction for Identification, Evaluation, and Management Manual (1993, BLM M-8351).

ORVs are defined by the WSRA as those characteristics that make the river worthy of special protection. The identification of ORVs is a critical step in developing the revised DWSR Management Plan. ORVs describe why a river is important enough to be designated and managed as a unit of the WSRS and what combinations of resource conditions and visitor experiences will best protect and enhance these values. Clearly defined management objectives address how these conditions and experiences can be achieved. ORVs are typically identified in a study prior to the designation of a WSR. The DWSR was designated as a component of the WSRS in ANILCA, but the ORVs were never specifically identified in the ANILCA legislation. In this case, ORVs have been identified from historical study reports and documentation of management activities at the time of designation. The proposed ORVs were identified based on a review of previous documents prepared for the Delta River and its environs[1].

Criteria for identifying ORVs have been developed by the Interagency Wild and Scenic Rivers Coordinating Council (IWSRCC) in its guidelines for implementation of the WSRA. The IWSRCC consists of representatives of the four wild and scenic rivers administering agencies: the BLM, National Park Service, U.S. Fish and Wildlife Service, and U.S. Forest Service. In these guidelines, the IWSRCC has established two criteria that must be satisfied for a characteristic to be included as an ORV:

1. The value must be river related. To be considered river related, a value must:

    - Be located in the river or on its immediate shorelands (generally within ½ mile on either side of the river) *and*
    - Contribute substantially to the functioning of the river ecosystem *or*
    - Owe its location or existence to the presence of the river.

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[1] The Wild and Scenic Rivers Act (WSRA).
Alaska National Interest Conservation Act (ANILCA).
"Delta River: A Wild and Scenic River Analysis", Bureau of Outdoor Recreation, March 1976.
"Draft Environmental Statement: Proposed Designation of the Delta River As an Element of the National Wild and Scenic Rivers System, Heritage Conservation and Recreation Service, 1978.
"Delta River: A Wild and Scenic River Analysis", Heritage Conservation and Recreation Service, February 1978.
"Delta River Management Plan", Bureau of Land Management, December 1983.
"Soil Survey of the Delta River Area, Alaska", Mark H. Clark, 2005.
"Delta Wild and Scenic River 2005 Recreation User Survey", Whittaker and Shelby, June 2006.
"Mineral Assessment of the Delta River Mining District Area, East-Central Alaska", Bittenbender, Bean, Kurtak, Deininiger, January 2007.

2. The value must be rare, unique, or exemplary in a regional or national context. To be considered rare, unique, or exemplary, a value should be a conspicuous example from among a number of similar values that are themselves uncommon or extraordinary.

The proposed ORVs for each segment of the DWSR corridor are included in Table 2, and are common to all alternatives in this planning effort.

Table 2: Proposed Outstandingly Remarkable Values of the Delta River by WSR Classification

WSR Classification	Proposed Outstandingly Remarkable Values
Wild Segment (32% of the WSR corridor)	Recreation, Scenic, Cultural, Fisheries
Scenic Segment (39 % of the WSR corridor)	Recreation, Scenic, Cultural, Wildlife
Recreational Segment (29% of the WSR corridor)	Recreation, Scenic

Following is a more in-depth discussion of the proposed ORVs listed above. Management objectives for each are also described:

2.2.1.1 ORV-Recreation

Within all WSR classification segments, the DWSR corridor provides outstandingly remarkable opportunities for a diversity of recreational experiences in a setting dominated by natural scenery and landscapes. The DWSR is one of a few easily accessible Wild and Scenic Rivers in the State of Alaska, providing both day use and overnight boating opportunities. A wide range of outstanding recreational opportunities attract people of all ages and abilities to the DWSR corridor where individuals, families, and groups have historically established traditional family ties with the area. Some segments of the river corridor provide outstanding opportunities for river-related solitude, enjoyment of natural river sounds, and primitive and unconfined recreation in a natural, undisturbed environment. Other segments provide a remote setting for recreation activities such as wildlife viewing, fishing, hunting, trapping, camping, hiking, snowmachining, skiing, photography, OHV travel, and a variety of water for both the floater and motorized boater. Boating opportunities include both lake paddling and river paddling on clear and glacial water stretches, challenging whitewater, and exceptional opportunities for both day use and extended overnight backcountry excursions.

Management Objectives:

- Preserve the river and its immediate environment in its natural condition while seeking to maintain a diversity of recreational experiences.
- Manage to maintain a primitive and semiprimitive recreational experience on specific segments of the river where visitors have opportunities for solitude.
- Manage recreational activities and facilities to maintain or enhance the undeveloped character of the river and surrounding environment.
- Ensure adequate instream flows to accommodate recreational opportunities.

2.2.1.2 ORV-Scenic

Within all WSR classification segments, the DWSR corridor provides unmatched and outstandingly remarkable scenic opportunities. The DWSR is flanked by both the low, rolling tundra hills of the Amphitheatre Mountains and the high, rugged snow covered peaks and ridges of the Alaska Range, providing high quality scenic vistas. The river and surrounding hills provide undisturbed views of the river canyon, waterfalls, channelized riverbeds, tributaries, granite rock outcroppings and glacial alluvial processes. There is a scenic interface of river, rock, tundra, and spruce dominated forest within the river corridor. Photographic opportunities are nearly limitless with snow, water, rock, and vegetation interspersed over rolling hills, mountains, and deep river valleys.

Management Objectives:

- Management activities will retain and seek to enhance the existing character of the landscape and Class I Visual Resource Management (VRM) viewshed within the river corridor.
- Improvements to recreational facilities within the river corridor will remain rustic and will be developed to harmonize with the natural surroundings of the area.

2.2.1.3 ORV-Cultural

The DWSR corridor contains outstandingly remarkable cultural resources within the *wild* and *scenic* classification segments, including portions of a 226,660 acre National Register Archaeological District created in 1971. The Tangle Lakes Archaeological District (TLAD), managed by BLM, contains approximately 25,677 acres within the DWSR corridor, with nearly 280 recorded archaeological sites (Bowers 1989), representing a roughly continuous history of human occupation from more than 10,000 years ago through the recent past. Almost all of the earliest known sites in the region are within the designated river corridor and hundreds of other sites are expected to exist within these areas (West 1981; Bowers 1989; Jangala et al 2009). Together, these factors make that portion of TLAD within the DWSR corridor nationally significant as one of the densest areas for early Holocene archaeology in the North American Sub-Arctic (Bowers 1989). Evidence of this prehistoric occupation can still be found within close proximity to many common campsites along the river corridor. The area also remains culturally significant for the Copper River Basin's natives, the Ahtna Athabascans (Kari and Tuttle 2005; Jangala et al 2009). The river corridor contains dozens of recorded Ahtna names and was likely a long term travel and trading route between the Copper River Basin and the Tanana Valley. The Tangle Lakes are considered by the Ahtna to be the ancient origin place of one of their oldest clans.

Management Objectives:

- Manage activities within the DWSR corridor to preserve cultural values that contribute to its primitive character.
- Inventory areas within the DWSR corridor that have not received previous archaeological surveys for additional historic and archaeological sites, as well as places of religious and cultural importance for local native peoples.
- Manage dispersed campsites and trails within the river corridor to eliminate erosion and minimize bare ground to reduce potential for disturbance of archaeological sites.
- Increase public knowledge of the significance of TLAD and the fragile nature of artifacts and archaeological sites that may be found within the river corridor to reduce looting or vandalism.

2.2.1.4 ORV-Fisheries

Within the *wild* classification segment, the DWSR provides outstandingly remarkable habitat for a resident, world-class Arctic grayling fishery. Few rivers anywhere in the world can match the quality and quantity of the Arctic grayling fishery in the DWSR. Results of recent abundance estimates for Arctic grayling in the *wild* classification segment indicated the 17 km study area had one of the greatest densities ever recorded for a population of Arctic grayling ≥ 270 mm length (Gryska, in preparation).

Management Objectives:

- Manage designated campsites and social trails to reduce soil compaction, soil erosion, sedimentation, and riparian vegetation loss and damage.
- Maintain and restore elements of the sediment regime including timing, volume, rate, and character of sediment input, storage, and transport.
- Maintain water quality necessary to support healthy riparian, aquatic, and wetland ecosystems.
- Maintain or enhance the physical integrity of the aquatic system including shorelines, streambanks, and bottom configurations.
- Maintain instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing.
- Maintain and restore the species composition and structural diversity of plant communities in riparian areas.

- Maintain habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.
- Cooperate with partner and research agencies in existing and future fish population monitoring, habitat assessment, habitat restoration, and research projects that are consistent with management objectives.

2.2.1.5 ORV-Wildlife

Within the *scenic* classification segment, the DWSR provides outstandingly remarkable wildlife viewing and photographic opportunities for a diversity of wildlife species. Migratory birds and waterfowl use the river corridor and the surrounding lakes as nesting areas. Trumpeter swans, a BLM sensitive species, nest in the wetlands of the Upper Tangles. Bald Eagles frequent the area to nest and hunt for fish and various waterfowl. Grizzly bears frequent the lowlands to fish and to hunt where moose drop their calves. Moose inhabit the lowlands in the summer while generally wintering at higher elevations in the surrounding hills. The *scenic* classification segment is also within the historical migratory path of the Nelchina caribou herd. Up to 34,000 caribou travel through the area each year in an annual migration to and from the calving grounds farther west. This exceptional combination of pristine habitat and wildlife contribute substantially to the functioning of the river ecosystem. Moreover, a unique tradition of subsistence use allows rural hunters to harvest moose and caribou in the river corridor, following long-held traditions passed on through thousands of years.

Management Objectives:

- Maintain or enhance wildlife habitat for migratory birds and waterfowl.
- Protect habitat for Trumpeter swans, a BLM sensitive species.
- Reduce potential sources of disruption for the migration and wintering of the Nelchina Caribou Herd.
- Ensure sound wildlife management for continued subsistence opportunities.
- Minimize human-bear encounters by encouraging visitors to use Leave No Trace camping techniques.

2.3 Alternative 1 -- No Action Alternative

In this alternative, current management would continue on the Delta River, guided by the 1983 DWSR Management Plan and the EARMP. ORVs and related management objectives would not be identified, and no decisions to manage use levels and associated impacts of recreational use would be made. BBM actions, including adaptive management standards and indicators, would not be implemented within the river corridor. Management options to address issues that were identified during scoping would be limited, and the management strategy would lack clear management goals and objectives to address impact issues within the river corridor. The no action alternative would not meet the objectives stated under *"Purpose and Need for Action"*, which include the development of a Delta River SRMA Plan and associated LUP Amendment.

2.4 Alternative 2 -- Proposed Action Alternative

The proposed action alternative is BLM's preferred alternative. BLM proposes to adopt the following BBM recreation objectives for the DWSR corridor, and the described indicators, standards, and adaptive management actions in Chapter 2.4.2.

2.4.1 Alternative 2 -- Benefits Based Management (BBM) Actions

BLM has developed specific BBM goals and objectives to address key issues identified during the initial planning studies for the DWSR, including specific indicators, standards, and adaptive management actions to address impacts associated with recreational use. The BBM planning process involves identifying distinct Recreation Management Zones (RMZs) for the entire Delta River SRMA, each having a specific recreation niche, or specialty, that serves the primary recreational market being targeted within each zone. The development of RMZs within the Delta River SRMA is a recreation allocation decision, based on the primary recreational activities that occur within different areas of the river corridor. In some

cases, RMZ boundaries do not exactly match the WSR classification category (wild, scenic, and recreational) boundaries (Map 2). However, RMZ decisions will be consistent with WSR classification categories described in Section 2(b) of the WSRA and BLM WSR Planning Guidance (BLM M-8351).

The Recreation Opportunity Spectrum (ROS) has been adopted by BLM as a tool for describing existing recreational setting character and for prescribing desired recreational setting character (BLM LUP H 1601-1, Appendix C) for each RMZ. The ROS provides a framework for classifying the diversity of recreational opportunities on public lands to accommodate a wide range of recreational users and activities. Typically, the ROS is divided into six major classes: urban, rural, roaded natural, semiprimitive motorized, semiprimitive nonmotorized, and primitive. Along this continuum, physical, social, and managerial conditions vary. One ROS class will be applied to each RMZ to help define the actual experience setting that will facilitate the desired outcomes for each RMZ. Proposed RMZs and targeted ROS experience settings for the Delta River SRMA are included in Tables 2 and 3 and Map 2.

Table 2: Alternative 2 - Delta River SRMA Proposed Recreation Management Zones and Acreages

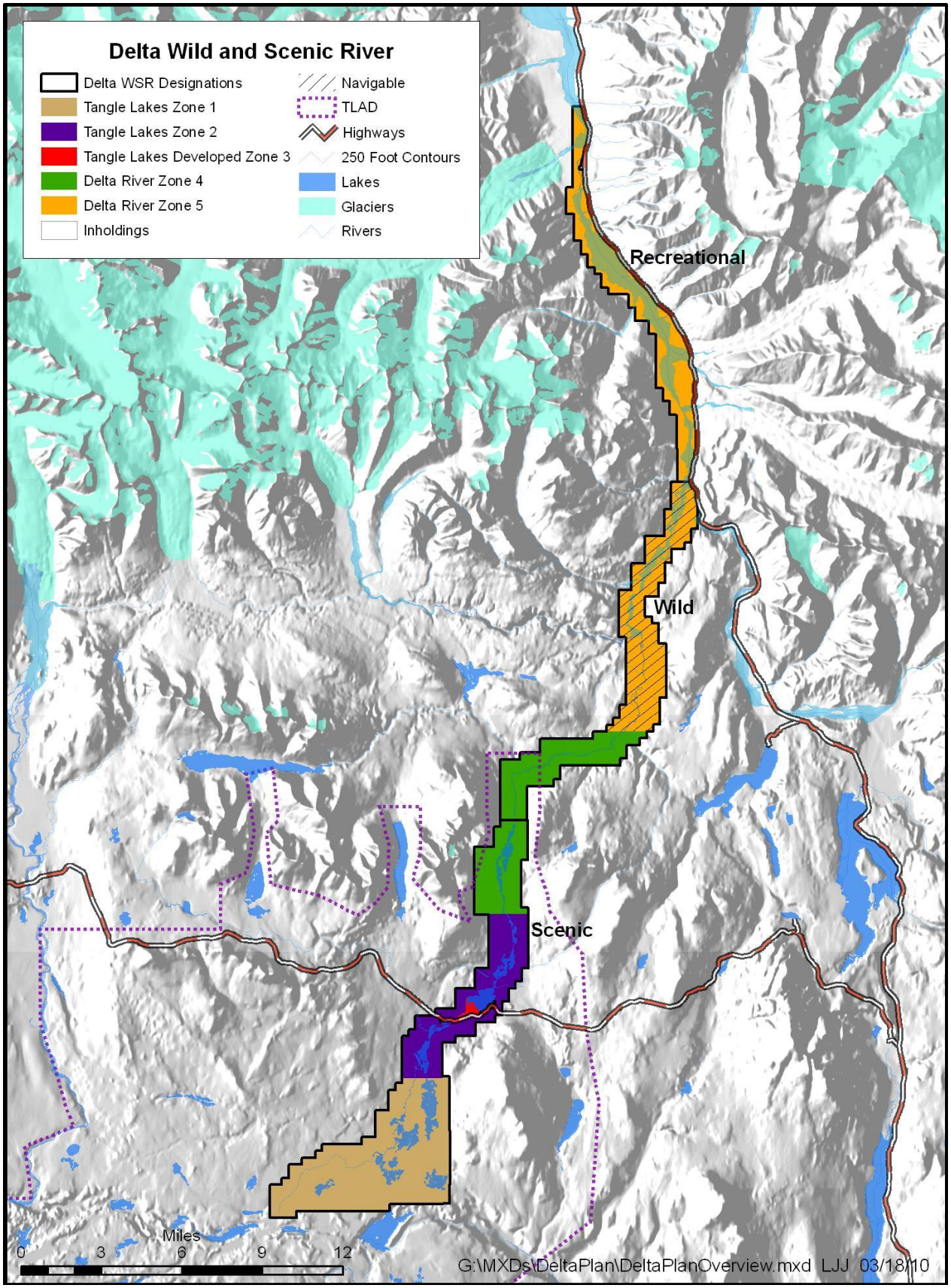
Proposed Recreation Management Zone (RMZ)	Acres
Tangle Lakes Zone 1	13362
Tangle Lakes Zone 2	6603
Tangle Lakes Developed Zone 3	248
Delta River Zone 4	8309
Delta River Zone 5*	16065

* In navigable portions of the river, lands that are located between the ordinary high water marks (including the bed and banks) are owned by the State of Alaska.

Table 3: Alternative 2 - ROS Experiences by Proposed RMZ

Recreation Management Zone	ROS Experience to be Managed For	Definition of Experience
Tangle Lakes Zone 1	Semiprimitive nonmotorized	Area is characterized by a high degree of naturalness. Concentration of users is low to moderate, but solitude is still possible. Area is free of motorized roads and trails, but some motorized boating use is present, limited by physical terrain features. Vegetation and soils are predominantly natural, but some impacts exist at campsites. Management presence is subtle and limited, absent of any facilities.
Tangle Lakes Zone 2	Semiprimitive motorized	Area is characterized by a predominantly naturally appearing environment. Concentration of users is moderate, and solitude is sometimes difficult to find. Motorized uses are common. Sights and sounds of the road system may or may not be dominant, but all portions are near motorized activities. Vegetation and soils are predominantly natural, but some impacts exist at campsites.
Tangle Lakes Developed Zone 3	Roaded Natural	Area is characterized by a moderate degree of naturalness, within sight and sounds of humans. User concentrations may be high in popular recreational sites, such as waysides, campgrounds, and water access points. Basic facilities exist for user convenience and safety, with a moderate level of management presence. Area is accessible by paved or gravel roads to conventional motorized vehicles.
Delta River Zone 4	Primitive	Area is characterized by an essentially unmodified natural environment, managed for primitive attributes and solitude. Concentration of users is very low and evidence of use is minimal. Sights and sounds of the road system are nonexistent and area is remote. Facilities are rustic and built for resource protection only. There is little or no evidence of motorized use, including OHV trails.
Delta River Zone 5	Semiprimitive motorized	See description for Tangle Lakes Zone 2.

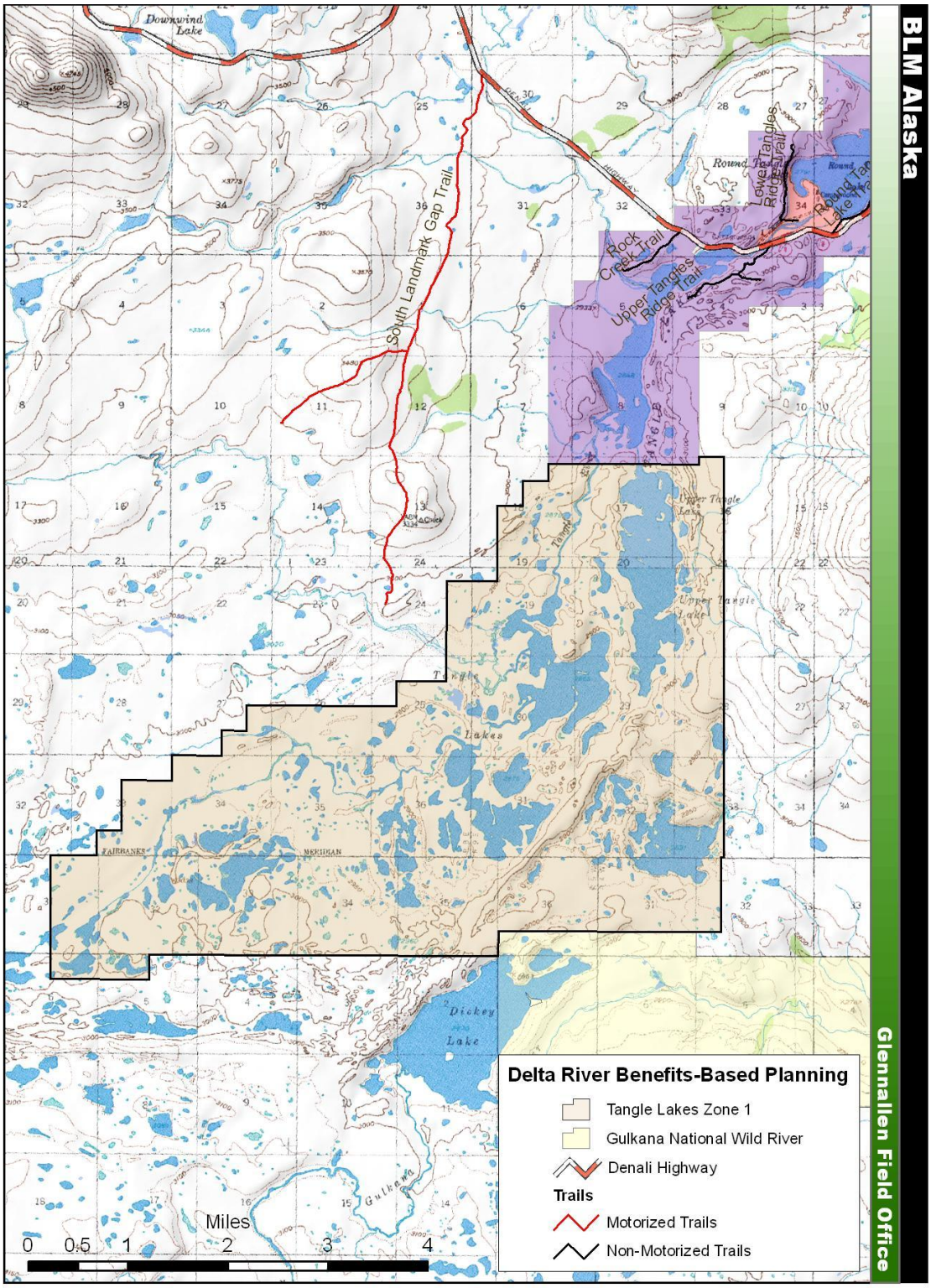
Map 2: Alternative 2 - Delta River SRMA Proposed Recreation Management Zones and WSR Designations



2.4.1.1 Alternative 2 -- Tangle Lakes Zone 1

Tangle Lakes Zone 1 is accessed from the DWSR Wayside and includes the southern portion of the Upper Tangle Lakes system to the extent of the river corridor boundary (this zone does not include the first lake and portage of the Upper Tangles, which is located in Tangle Lakes Zone 2). The zone is located entirely within the TLAD and contains approximately 13,362 acres of BLM lands.

Map 4: Tangle Lakes Zone 1



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Alternative 2 – Tangle Lakes Zone 1

PRIMARY MARKET STRATEGY	PRIMARY MARKET
Destination	Nonmotorized boaters and hikers from Alaska

NICHE DECISION
The unique features of this zone allow for visitors to engage in diverse recreational activities in a semiprimitive environment that becomes more primitive as you travel further from the Denali Highway, while remaining relatively close to facilities that provide easy access to the zone.

MANAGEMENT OBJECTIVE DECISION
The primary focus within the zone will be to manage and provide opportunities for nonmotorized lake boating, dispersed hiking and wildlife viewing activities. Recreational emphasis will be on providing a seasonal, semiprimitive nonmotorized experience in an easily accessible, naturally appearing landscape.

PRIMARY TARGETED OUTCOMES		
Activities	**Experiences**	**Benefits**
• nonmotorized lake boating • dispersed hiking • wildlife viewing	• enjoying solitude, natural quiet and natural sounds • learning about nature and wildlife	• greater self-reliance and confidence • closer relationship with the natural world

OUTCOMES TO BE AVOIDED		
Activities	**Experiences**	**Negative Benefits**
• Unauthorized OHV use • Motorized boating during June and July • Airplane landings during June and July	• loss of solitude and ability to view wildlife • loss of cultural history caused by resource damage • reduced natural quiet and natural sounds	• increased mental tension and stress with loss of solitude • decreased relationship with the natural world • loss of naturalness and increased disturbance to area resources

SETTING CHARACTER DECISION -- SEMIPRIMITIVE NONMOTORIZED		
Physical	**Social**	**Administrative**
Remoteness: The zone will be managed for a seasonal, semiprimitive nonmotorized experience, with opportunities for a more primitive experience as you travel further from the Denali Highway. **Naturalness:** The zone is natural in appearance, but may be within site of the Denali Highway and developed facilities. Conditions become more primitive as you progress further south. **Facilities:** 15 primitive campsites will be designated for overnight use. Portage trails between the lakes will remain unimproved.	**Contacts:** Manage for 4-6 encounters per day on the weekend and 2-4 encounters per day during the week. **Group Size:** Manage for an average group size of 3-5 people. **Evidence of Use:** Minor evidence of use, including slight vegetation trampling at campsites and on portage routes will be expected.	**Mechanized Use:** Decisions regarding mechanized use are described below under *Travel Management.* **Management Controls:** Agency personnel will conduct field patrols approximately three times per season. **Visitor Services:** River patrol crews will make contact with lake and river users.

IMPLEMENTATION FRAMEWORK DECISIONS	
Management	**Adaptive Management Actions:** Actions described in Chapter 2.4.2 for the management of litter, human waste, fire rings, campsite impacts, and private/commercial user capacity will be adopted. Impact levels will be monitored; if standards are exceeded, management actions will be implemented as described. **Special Recreation Permits (SRP):** Commercial group sizes will be limited to 10 people per campsite. Commercial guides will be required to use designated campsites and portable toilets. Competitive events may be authorized based on compatibility with specified ORVs for the zone. **Travel Management:** Tangle Lakes Zone 1 is located entirely within the TLAD. Special Rules for the TLAD identify designated OHV trails and limitations on OHV use to protect archeological resources. There are no existing designated OHV trails within the zone. Unauthorized OHV routes will be closed and rehabilitated. Signs that identify OHV use limitations will be used to reinforce TLAD trail restrictions. BLM will monitor visitor use to ensure the protection of resources and compliance with TLAD trail restrictions. Education and enforcement will be used help limit the proliferation of unauthorized trails. Portage trails between the lakes will remain unimproved and trail maintenance will only be used to prevent resource damage and trail proliferation, using native materials (e.g. rocks, spruce) and primitive trail construction methods. Trail reroutes or closure of spur trails within the portage areas may be used to prevent the proliferation of redundant trails. If trail proliferation does occur, rock cairns or unobtrusive signage may be used to mark the portage routes. The use of pack animals, mechanized travel (e.g. mountain bikes) and dog mushing will be permitted for dispersed use throughout the zone. Motorized boating and airplane landings will be seasonally restricted within the zone to help preserve the targeted beneficial outcomes and setting character decisions. Specific limitations are described below under administrative actions. New airstrips will not be authorized within the zone. **Facilities:** There will be no developed facilities within the zone. Public use cabins will not be considered for development. The absence of facilities is a characteristic that makes this zone unique, providing solitude in a natural, primitive setting. **Education and Interpretation:** Information will be developed to inform and educate visitors about current river resource conditions, rules and regulations, recreational opportunities, and Leave No Trace low impact camping techniques. River crews will make contact with users to educate low impact camping and river ethics. The primary goal within this zone is to provide interpretation of area resources through self discovery.
Marketing	• Recreational opportunities within the zone will be marketed by providing information on the BLM website and BLM brochures. • User groups, communities, volunteers, and other interested parties may help to monitor and maintain river resources through partnerships and special events.
Monitoring	• BLM will assure that BBM outcomes and objectives are being met and setting prescriptions are being maintained through the administration of BBM visitor satisfaction surveys. • Using an adaptive management approach, BLM will monitor and evaluate whether identified standards are being maintained. Monitoring will be conducted using river patrols, river surveys, and visitor registration. Management actions (described in Chapter 2.4.2) will be implemented in response to monitored conditions.

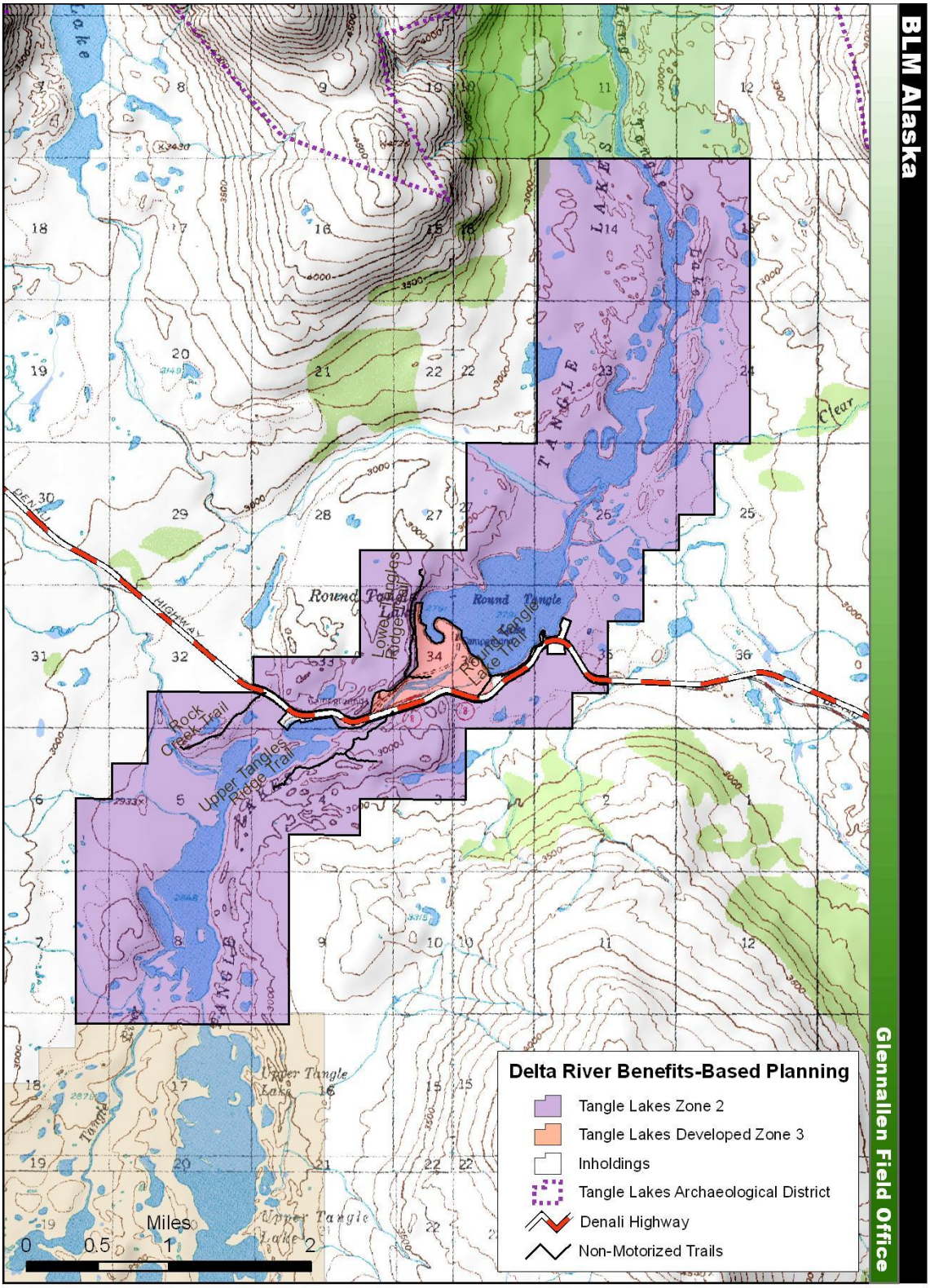
IMPLEMENTATION FRAMEWORK DECISIONS	
Administrative	Special Rules for the river corridor will be developed in accordance with 43 CFR 8351.2-1 to address restrictions on travel management, group size, occupancy and use, chainsaw use and firewood gathering, recreational shooting, fireworks, supply caching, and disposal of human waste. **Travel Management:** The use of snowmachines and OHVs will only be permitted during periods of adequate snow cover (at least 6" of ground frost or 12" of snow cover). During June and July, motorized boating and airplane landings will be prohibited. During the closed season, subject to reasonable regulations and with BLM authorization, qualified rural residents may be permitted to use motorized boats or other means of surface transportation traditionally employed for subsistence purposes (ANILCA Sec. 811). Similarly, access via motorboats, airplanes and nonmotorized surface transportation may also be permitted for traditional activities (ANILCA Sec 1110). Authorization may be obtained in person, by mail, online, and by phone from BLM Glennallen Field Office. The operation of motorized boats and the landing of airplanes during the closed season would be allowed by State and Federal government agencies for emergency purposes. **Group Size:** Group sizes will be limited to a maximum of 10 people per campsite. Groups in excess of 10 people per campsite must obtain written authorization with special stipulations from BLM. **Occupancy and Use:** Camping will be limited to 14 consecutive days within the river corridor within any 60 day period. Designated campsites must be used when camping immediately adjacent to the lakes and river. Dispersed camping (away from the lakes and river) will be permitted when using Leave No Trace low impact camping methods. **Chainsaw Use and Firewood Gathering:** The use of chainsaws for campsite firewood will be prohibited. Only dead and down wood may be used for campfires. The cutting of green trees and vegetation will not be permitted. **Recreational Shooting:** The recreational discharge of weapons (i.e. target shooting or "plinking") will be prohibited. **Fireworks:** The use of fireworks will be prohibited. **Supply Caching:** The caching of supplies will only be allowed through written authorization with special stipulations from BLM. **Disposal of Human Waste:** Proper disposal of human wastes per Alaska Department of Environmental Conservation (ADEC) regulation 18 AAC 72.020 will be required[2]. Commercial guides will be required to use portable toilets.

[2] *Human waste shall not be disposed of on state-owned shorelands (such as gravel bars and sand bars), in accordance with AS 46.03.800 - 810. On all lands including state, federal and private, human waste may be disposed of in a cathole at least 100 feet away from the ordinary high water mark of streams, rivers, or lakes in accordance with Alaska Department of Environmental Conservation (ADEC) regulation 18 AAC 72.020.*

2.4.1.2 Alternative 2 -- Tangle Lakes Zone 2

Tangle Lakes Zone 2 includes the first lake and portage area of the Upper Tangle Lakes (accessed from the DWSR Wayside), Round Tangle Lake, and portions of Long Tangle Lake. The zone is located entirely within the TLAD and contains approximately 6,603 acres of BLM lands.

Map 5: Tangle Lakes Zone 2



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Alternative 2 – Tangle Lakes Zone 2

PRIMARY MARKET STRATEGY	PRIMARY MARKET
Destination	Motorized and nonmotorized boaters and hikers from Alaska National and International visitors traveling the Denali Highway

NICHE DECISION		
The zone provides opportunities for visitors to engage in easily accessible, water-based recreational experiences on the lake system, and developed trail hiking opportunities in the surrounding uplands, while located relatively close to campground facilities.		
MANAGEMENT OBJECTIVE DECISION		
The primary focus within the zone will be to manage and provide opportunities for motorized and nonmotorized lake boating and developed trail hiking activities. Recreational emphasis will be on providing a semiprimitive motorized experience offering social group and family affiliation opportunities in an easily accessible, naturally appearing landscape.		
PRIMARY TARGETED OUTCOMES		
Activities	**Experiences**	**Benefits**
• hiking • motorized lake boating • nonmotorized lake boating	• learning about nature • physical exercise	• improved health/fitness • closer relationship with the natural world
OUTCOMES TO BE AVOIDED		
Activities	**Experiences**	**Negative Benefits**
• Unauthorized OHV use	• loss of cultural history caused by resource damage • negative impacts to scenery and natural landscapes	• increased levels of use from easier access • loss of naturalness and increased disturbance to the area resources

SETTING CHARACTER DECISION – SEMIPRIMITIVE MOTORIZED		
Physical	**Social**	**Administrative**
Remoteness: The zone will be managed for a semiprimitive motorized experience with a low to moderate concentration of users. **Naturalness:** The zone is natural in appearance, but within site of the highway and developed facilities. **Facilities:** 25 primitive campsites will be designated for overnight use. There will be one unimproved portage trail located between the first and second lakes of the Upper Tangles. Four nonmotorized hiking trails will be designated and developed within the zone.	**Contacts:** Manage for 6-10 encounters per day on the weekend and 4-6 encounters per day during the week. **Group Size:** Manage for an average group size of 4-6 people. **Evidence of Use:** Minor evidence of use, including slight vegetation trampling at campsites and on hiking trails will be expected.	**Mechanized Use:** Decisions regarding mechanized use are described below under *Travel Management*. **Management Controls:** Agency personnel will conduct field patrols approximately three times per season. **Visitor Services:** River patrol crews will make contact with lake and river users. Brochures will be available and interpretive information will be provided at the boat launches.

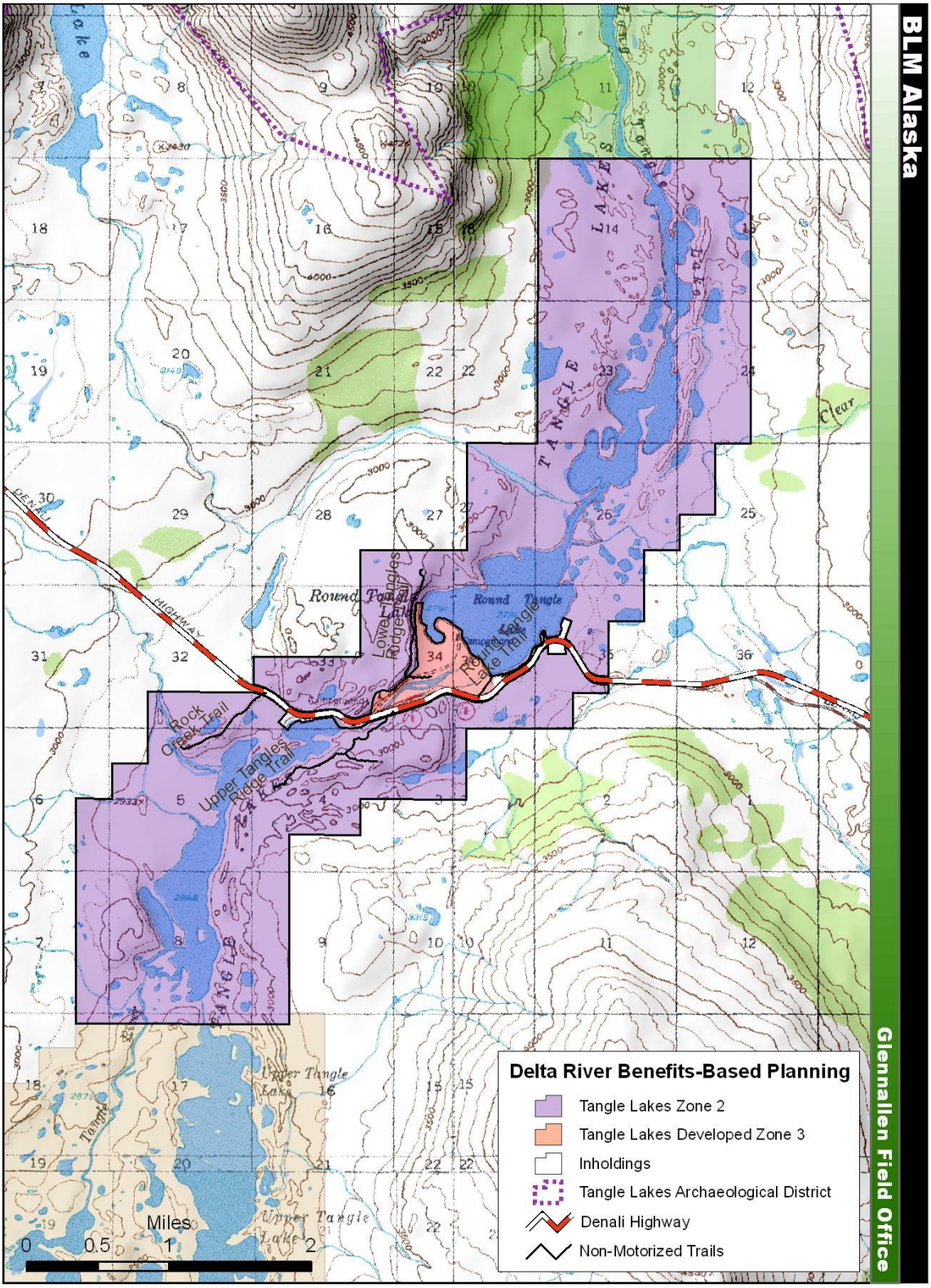
IMPLEMENTATION FRAMEWORK DECISIONS	
Management	**Adaptive Management Actions:** Actions described in Chapter 2.4.2 for the management of litter, human waste, fire rings, campsite impacts, and private/commercial user capacity will be adopted. Impact levels will be monitored; if standards are exceeded, management actions will be implemented as described. **Special Recreation Permits (SRP):** Commercial group sizes will be limited to 10 people per campsite. Commercial guides will be required to use designated campsites and portable toilets. Competitive events may be authorized based on compatibility with specified ORVs for the zone. **Travel Management:** Tangle Lakes Zone 2 is located entirely within the TLAD. Special Rules for the TLAD identify designated OHV trails and limitations on OHV use to protect archeological resources. There are no existing designated OHV trails within the zone. The Round Tangle Lake Trail and a trail at Mile 22 Denali Highway North are unauthorized OHV trails and will be closed to OHV use and rehabilitated. Signs that identify OHV use limitations will be used to reinforce TLAD trail restrictions. BLM will monitor visitor use to ensure the protection of resources and compliance with TLAD trail restrictions. Education and enforcement will be used help limit the proliferation of unauthorized trails. A developed hiking trail system will be created within the zone. Trails will be designated as nonmotorized, and interpretive panels may be installed to educate users about the archaeological significance and subsistence lifestyles of the area. Designated nonmotorized hiking trails will include the Lower Tangles Ridge Trail, Rock Creek Trail, Upper Tangles Ridge Trail, and the Round Tangle Lake Trail. The use of pack animals, mechanized travel (e.g. mountain bikes) and dog mushing will be permitted for dispersed use throughout the zone, but not on developed hiking trails. The portage trail located between the first and second lakes of the Upper Tangles will remain unimproved and trail maintenance will only be used to prevent resource damage and trail proliferation, using native materials (e.g. rocks, spruce) and primitive trail construction methods. If trail proliferation does occur, rock cairns and unobtrusive signage may be used to mark the portage route. There will be no restrictions on motorized boating or airplane landings. New airstrips will not be authorized within the zone. BLM will periodically monitor water quality (including petroleum hydrocarbons) within the zone. If measured petroleum hydrocarbon levels exceed State water quality standards, BLM will consider restrictions to meet the standards. **Facilities:** There will be no developed facilities within the zone. Developed facilities that are used to access the zone are located in RMZ 3. Outhouses will not be constructed along the portage, and public use cabins will not be considered for development. **Property Acquisition:** BLM will consider the acquisition of private parcels for sale within the zone for inclusion into the DWSR corridor. **Education and Interpretation:** The zone provides family-based recreational opportunities that appeal to many Denali Highway visitors who are passing through the area and do not plan on making extended trips into the adjacent zones. Education and interpretive materials will be targeted towards this group to help develop an understanding of subsistence lifestyles, cultural awareness, natural resource protection, recreational opportunities, and the need for use restrictions. Interpretive panels will be developed for designated, nonmotorized hiking trails to promote a better cultural and natural resource awareness of the area. Leave No Trace education will be emphasized with informal presentations at the boat launches and by providing interpretive materials at the launch locations. River crews will make contact with users to educate low impact camping and river ethics.

IMPLEMENTATION FRAMEWORK DECISIONS	
Marketing	• Recreational opportunities within the zone will be widely marketed and will include information on the BLM website, brochures, and interpretive displays. Marketing of this zone helps to support local area businesses and private enterprises. • User groups, communities, volunteers, and other interested parties may help to monitor and maintain river resources through partnerships and special events
Monitoring	• BLM will assure that BBM outcomes and objectives are being met and setting prescriptions are being maintained through the administration of BBM visitor satisfaction surveys. • Using an adaptive management approach, BLM will monitor and evaluate whether identified standards are being maintained. Monitoring will be conducted using river patrols, river surveys, and visitor registration. Management actions (described in Chapter 2.4.2) will be implemented in response to monitored conditions.
Administrative	Special Rules for the river corridor will be developed in accordance with 43 CFR 8351.2-1 to address restrictions on travel management, group size, occupancy and use, chainsaw use and firewood gathering, recreational shooting, fireworks, supply caching, and disposal of human waste. **Travel Management:** The use of snowmachines and OHVs will only be permitted during periods of adequate snow cover (at least 6" of ground frost or 12" of snow cover). The use of pack animals, mechanized travel (e.g. mountain bikes) and dog mushing will not be permitted on the Lower Tangles Ridge Trail, Rock Creek Trail, Upper Tangles Ridge Trail, and the Round Tangle Lake Trail. **Group Size:** Group sizes will be limited to a maximum of 10 people per campsite. Groups in excess of 10 people per campsite must obtain written authorization with special stipulations from BLM. **Occupancy and Use:** Camping will be limited to 14 consecutive days within the river corridor within any 60 day period. Designated campsites must be used when camping immediately adjacent to the lakes and river. Dispersed camping (away from the lakes and river) will be permitted when using Leave No Trace low impact camping methods. **Chainsaw Use and Firewood Gathering:** The use of chainsaws for campsite firewood will be prohibited. Only dead and down wood may be used for campfires. The cutting of green trees and vegetation will not be permitted. **Recreational Shooting:** The recreational discharge of weapons (i.e. target shooting or "plinking") will be prohibited. **Fireworks:** The use of fireworks will be prohibited. **Supply Caching:** The caching of supplies will only be allowed through written authorization with special stipulations from BLM. **Disposal of Human Waste:** Proper disposal of human wastes per Alaska Department of Environmental Conservation (ADEC) regulation 18 AAC 72.020 will be required. Commercial guides will be required to use portable toilets.

2.4.1.3 Alternative 2 -- Tangle Lakes Developed Zone 3

Tangle Lakes Developed Zone 3 includes the Tangle Lakes Campground, DWSR Wayside, and portions of the Tangle River that flow through the developed facility areas. The zone is located entirely within the TLAD and contains approximately 248 acres of BLM lands.

Map 6: Tangle Lakes Developed Zone 3



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Alternative 2 -- Tangle Lakes Developed Zone 3

PRIMARY MARKET STRATEGY	PRIMARY MARKET
Destination	National and International visitors traveling the Denali Highway

NICHE DECISION
The zone provides opportunities for visitors to engage in day use activities and overnight camping in an easily accessible, developed recreation setting with a moderate level of BLM management presence. Close proximity to the Denali Highway and commercial services provides limited amenities and assistance if needed.

MANAGEMENT OBJECTIVE DECISION
The primary focus within the zone will be to manage and provide opportunities for developed overnight camping and fishing activities in BLM facilities that are easily accessible from the Denali Highway. Recreational emphasis will be on providing a roaded natural experience offering social group and family affiliation opportunities within a partially modified, naturally appearing landscape.

PRIMARY TARGETED OUTCOMES		
Activities	**Experiences**	**Benefits**
• developed camping • fishing	• spending time with family and friends • experiencing cultural history	• social interaction with other visitors • stronger ties with family and friends

OUTCOMES TO BE AVOIDED		
Activities	**Experiences**	**Negative Benefits**
• Unauthorized OHV use in the Tangle River and developed facilities	• reduced natural quiet and natural sounds • loss of cultural history caused by resource damage • negative impacts to scenery and natural landscapes	• decreased relationship with the natural world • loss of naturalness and increased disturbance to the area resources

SETTING CHARACTER DECISION – ROADED NATURAL		
Physical	**Social**	**Administrative**
Remoteness: The zone will be managed for a roaded natural experience, where other users are routinely expected, but privacy is still possible within designated campsites. **Naturalness:** The zone is partially modified by gravel roads, recreation facilities, and evidence of adjacent private property, but this does not overpower the natural features of the surrounding landscape. **Facilities:** Facilities within the zone will include the campground, wayside, two boat launches, and interpretive sites.	**Contacts:** Manage for a high level of encounters with other visitors within the developed facilities. People are generally present at campsites, but distant enough to prevent interactions. **Group Size:** Manage for group sizes not to exceed 10 people per designated campsite. **Evidence of Use:** Most areas are gravel surfaced for erosion control. Worn soils and trampled vegetation may be present in isolated locations along the banks of the Tangle River, and in some areas throughout the developed facilities.	**Mechanized Use:** Decisions regarding mechanized use are described below under *Travel Management*. **Management Controls:** Volunteer campground hosts will be present at the Tangle Lakes Campground and DWSR Wayside. Agency and law enforcement personnel will be periodically present within the campground and wayside. **Visitor Services:** Brochures will be available and interpretive information will be posted throughout the developed facilities.

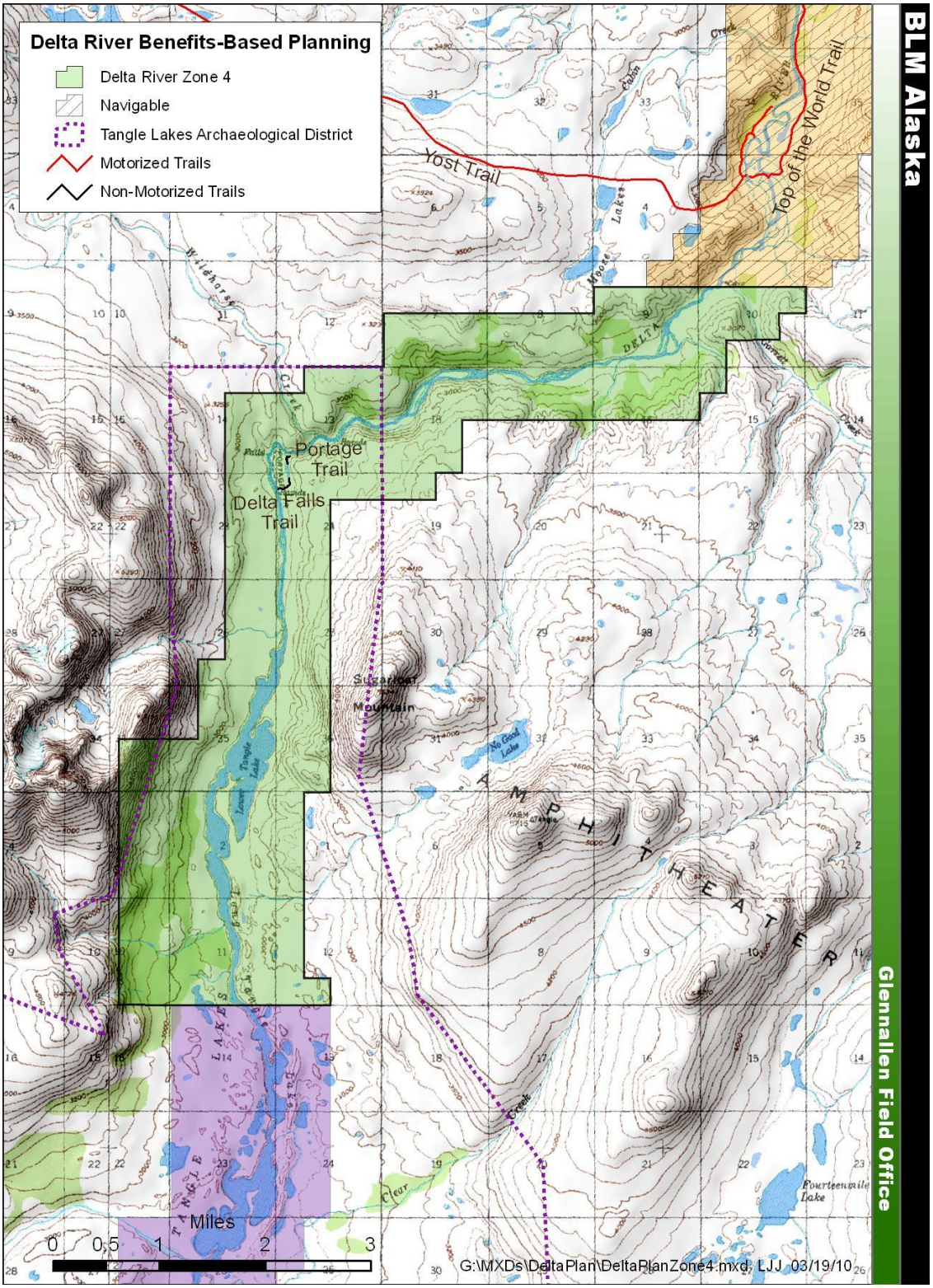
IMPLEMENTATION FRAMEWORK DECISIONS	
Management	**Litter:** Litter receptacles will be provided in the developed facility areas. Campground hosts will provide education and enforcement regarding proper litter disposal. **Human and Pet Waste:** BLM will require the proper disposal of human and pet wastes per ADEC and CFR 8365 regulations that address litter and solid waste disposal, water pumping restrictions, and other sanitation issues. **Fire Rings:** Metal fire rings will be provided in designated campsites and picnic areas in the developed facilities. **Campsite Impacts:** A planned redesign of the Tangle Lakes Campground will develop and designate campsites to limit the unauthorized creation of campsites that is causing vegetation damage. A separate EA will analyze site-specific considerations related to the campground redesign. Campsites that are not designated will be closed and rehabilitated. Walk-in campsites from the campground to locations along Round Tangle Lake and the Tangle River may be considered for development. **Private and Commercial User Capacity:** Campground use will be self-limiting due to the availability of 45 designated campsites and restrictions on the number of people and vehicles per site. A campsite map will be developed that will display designated campsites that are available on a first-come, first-serve basis to the public. **Special Recreation Permits (SRP):** Commercial group sizes will be limited to 10 people per campsite. Competitive events may be authorized based on compatibility with specified ORVs for the zone. **Travel Management:** Tangle Lakes Developed Zone 3 is located entirely within the TLAD. Special Rules for the TLAD identify designated OHV trails and limitations on OHV use to protect archeological resources. There are no existing designated OHV trails within the zone. Unauthorized OHV routes will be closed and rehabilitated. Signs that identify OHV use limitations will be used to reinforce TLAD trail restrictions. BLM will monitor trails to ensure the protection of resources and compliance with TLAD trail restrictions. Education and enforcement will be used help limit the proliferation of unauthorized trails. The use of pack animals, mechanized travel (e.g. mountain bikes) and dog mushing will be permitted for dispersed use throughout the zone. There will be no restrictions on motorized boating or airplane landings. Motorized boating is naturally restricted by shallow river conditions and airplane landings are not practical in the developed facilities due to the lack of suitable airstrips. New airstrips will not be authorized within the zone. **Facilities:** Future facility developments may include the construction of a wayside at the campground entrance that would provide day use services with parking facilities, outhouses, picnicking facilities, interpretive panels, and walking trails along the Tangle River. After the redesign of the campground, user fees will be implemented at the same rate as other BLM campgrounds in the Glennallen Field Office. Public use cabins will not be considered for development. Boat launch facilities will include boater registration kiosks, river survey boxes, and interpretive panels. The installation of an educational river portal facility or portable toilet cleanout facility would be considered if a permit system is implemented and if portable toilets are required by river and lake users in the future. **Property Acquisition:** BLM will consider acquisition of private parcels for sale within the zone for inclusion into the DWSR corridor. **Education and Interpretation:** Educational and interpretive panels will be provided to promote a better cultural and natural resource awareness of the area. Materials will be targeted to help develop an understanding of subsistence lifestyles, cultural awareness, natural resource protection, recreational opportunities, and the need for use restrictions. Leave No Trace education will be emphasized with presentations at the boat launches and by providing interpretive materials throughout the developed facilities.

IMPLEMENTATION FRAMEWORK DECISIONS	
Marketing	• Recreational opportunities within the zone will be widely marketed and will include information on the BLM website, brochures, and interpretive displays. Marketing of this zone helps to support local area businesses and private enterprises. • User groups, communities, volunteers, and other interested parties may help to maintain river resources through partnerships and special events.
Monitoring	• BLM will assure that BBM outcomes and objectives are being met and setting prescriptions are being maintained through the administration of BBM visitor satisfaction surveys. • Volunteer campground hosts will provide information and education and provide a point of contact for user input and suggestions. Registration and comment cards will be provided for visitors to express their concerns or appreciation. • Law enforcement staff will periodically patrol the facilities to provide enforcement of rules and regulations, and will assure that measures are in place to enforce administrative restrictions. • Maintenance and management oversight will be provided on a routine basis. Periodic and annual safety inspections will be conducted for all developed facilities.
Administrative	Supplemental Rules for the developed facilities will be developed in accordance with 43 CFR 8365 to address restrictions on travel management, group size, occupancy and use, chainsaw use and firewood gathering, recreational shooting, fireworks, and disposal of human and pet waste. **Travel Management:** The use of snowmachines and OHVs to travel cross country will only be permitted during periods of adequate snow cover (at least 6" of ground frost or 12" of snow cover). The use of OHVs within the Tangle River will be prohibited. OHV use will only be allowed for ingress and egress to the developed facilities on gravel travel routes designated for motorized travel. The use of OHVs within the developed facilities, other than for ingress or egress, will be prohibited. **Group Size:** Group sizes will be limited to a maximum of 10 people and 2 vehicles per designated campsite (one of which may be a recreational vehicle). Groups in excess of 10 people may camp in the designated group camping areas. **Occupancy and Use:** Camping will be limited to 14 consecutive days within the river corridor within any 60 day period. Designated campsites must be used within the campground. Overnight camping will be prohibited at the DWSR Wayside day use facility. Unoccupied, overnight parking of vehicles will be permitted at the wayside to preserve overnight access to the Upper Tangle Lakes. **Chainsaw Use and Firewood Gathering:** Firewood collecting will be prohibited within the developed facilities or along the Tangle River. Firewood must be brought from outside the river corridor. The use of chainsaws for cutting campsite firewood will be allowed in the developed facilities. **Recreational Shooting:** The recreational discharge of weapons (i.e. target shooting or "plinking") will be prohibited. **Fireworks:** The use of fireworks will be prohibited. **Disposal of Human and Pet Waste:** Proper disposal of human wastes per ADEC regulations will be required. Pet waste, including pack animal wastes, must be properly disposed of and any campsites cleaned of animal waste prior to vacating the campsite.

2.4.1.4 Alternative 2 -- Delta River Zone 4

Delta River Zone 4 includes the upper Delta River from Long Tangle Lake to the confluence of Garrett Creek, containing approximately 8,309 acres of BLM lands. The southern portion of the zone is located within the TLAD.

Map 7: Delta River Zone 4



Alternative 2 -- Delta River Zone 4

PRIMARY MARKET STRATEGY	PRIMARY MARKET
Destination	Nonmotorized boaters and hikers from Alaska

NICHE DECISION
The zone provides opportunities for visitors to engage in primitive recreational experiences that are characterized by solitude, self reliance, and tranquility in an undisturbed natural environment.

MANAGEMENT OBJECTIVE DECISION
The primary focus within the zone will be to manage and provide opportunities for nonmotorized river boating and fishing activities. The zone will be managed to protect and enhance the qualities and characteristics that are found within a primitive environment. Recreational emphasis will be on providing for a seasonal, primitive nonmotorized experience in an undisturbed, naturally appearing landscape.

PRIMARY TARGETED OUTCOMES		
Activities	**Experiences**	**Benefits**
• nonmotorized river boating • fishing	• enjoying solitude • escaping everyday responsibilities and social pressures • having time to reflect	• relief of mental tension and stress • closer relationship with the natural world

OUTCOMES TO BE AVOIDED		
Activities	**Experiences**	**Negative Benefits**
• Unauthorized OHV use • Motorized boating during June and July • Airplane landings during June and July	• loss of solitude • reduced natural quiet and natural sounds	• increased mental tension and stress with loss of solitude • loss of naturalness and increased disturbance to area resources • decreased relationship with the natural world

SETTING CHARACTER DECISION – PRIMITIVE NONMOTORIZED		
Physical	**Social**	**Administrative**
Remoteness: The zone will be managed for a seasonal, primitive nonmotorized experience with a very low concentration of users. **Naturalness:** The zone is extremely natural in appearance and sights or sounds of the road system are nonexistent. **Facilities:** 20 primitive campsites will be designated for overnight use. There will be two maintained portage trails and one outhouse at the river portage. Warning signs will be limited to those necessary to ensure user safety. The boater registration kiosk and survey box will be removed, and the outhouse will be removed if portable toilets are required in the future.	**Contacts:** Manage for 2-3 encounters per day on the weekend and 0-2 encounters per day during the week. **Group Size:** Manage for an average group size of 2-4 people. **Evidence of Use:** Minor evidence of use, including slight vegetation trampling at campsites and on portage routes will be expected.	**Mechanized Use:** Decisions regarding mechanized use are described below under *Travel Management*. **Management Controls:** Agency personnel will conduct field patrols approximately three times per season. **Visitor Services:** River patrol crews will make contact with river users.

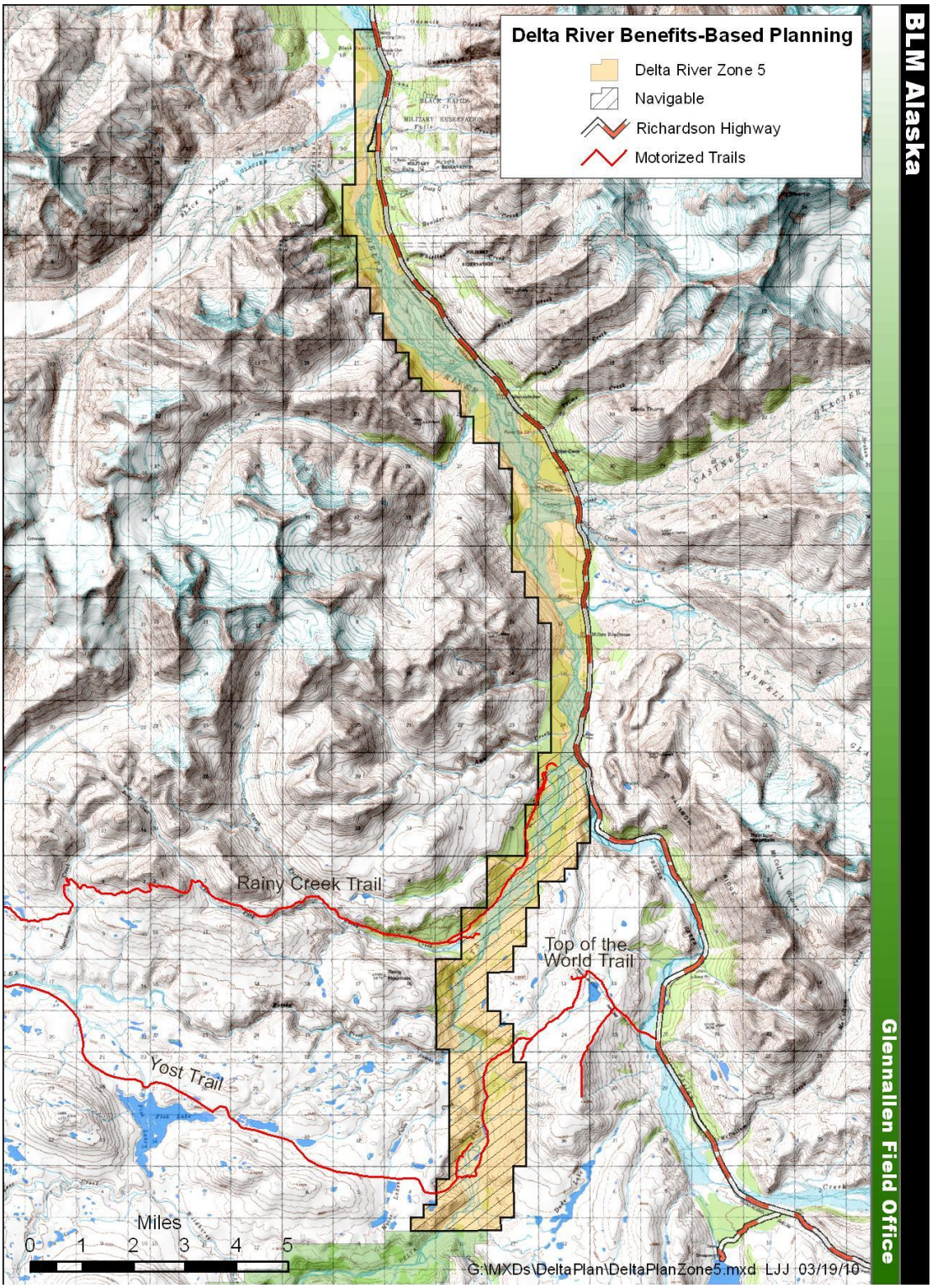
IMPLEMENTATION FRAMEWORK DECISIONS	
Management	**Adaptive Management Actions:** Actions described in Chapter 2.4.2 for the management of litter, human waste, fire rings, campsite impacts, and private/commercial user capacity will be adopted. Impact levels will be monitored; if standards are exceeded, management actions will be implemented as described. **Special Recreation Permits (SRP):** Commercial group sizes will be limited to 10 people per campsite. Commercial guides will be required to use designated campsites and portable toilets. Competitive events may be authorized based on compatibility with specified ORVs for the zone. **Travel Management:** Portions of Delta River Zone 4 are located within the TLAD. Special Rules for the TLAD identify designated OHV trails and limitations on OHV use to protect archeological resources. There are no existing designated OHV trails within the zone. Unauthorized OHV routes will be closed and rehabilitated. Signs that identify OHV use limitations will be used to reinforce TLAD trail restrictions. BLM will monitor visitor use to ensure the protection of resources and compliance with TLAD trail restrictions. Education and enforcement will be used help limit the proliferation of unauthorized trails. Portage trails will be maintained to prevent resource damage and trail proliferation, using native materials (e.g. rocks, spruce) and primitive trail construction methods. Trail reroutes or closure of spur trails within the portage areas may be used to prevent the proliferation of redundant trails. If trail proliferation does occur, rock cairns and/or unobtrusive signage may also be used to mark the portage routes. Additional nonmotorized trails may be designated and developed in the future in the Garrett Creek drainage. The use of pack animals, mechanized travel (e.g. mountain bikes) and dog mushing will be permitted for dispersed use throughout the zone. Motorized boating and airplane landings will be seasonally restricted within the zone to help preserve the targeted beneficial outcomes and setting character decisions. Specific limitations are described below under administrative actions. New airstrips will not be authorized within the zone. **Facilities:** Facilities will include one outhouse and two portage warning signs. Portage warning signs will remain discrete, but noticeable. The existing boater registration kiosk and survey box will be removed, and the outhouse will be removed if portable toilets are required in the future and a portable toilet cleanout facility is developed. Public use cabins will not be considered for development. The absence of facilities is a characteristic that makes this zone unique, providing solitude in a natural, primitive setting. **Education and Interpretation:** Information will be developed to inform and educate visitors about current river resource conditions, rules and regulations, recreational opportunities, and Leave No Trace low impact camping techniques. River crews will make contact with users to educate low impact camping and river ethics. The primary goal within this zone is to provide interpretation of area resources through self discovery.
Marketing	• Recreational opportunities within the zone will be marketed by providing information on the BLM website and BLM brochures. • User groups, communities, volunteers, and other interested parties may help to monitor and maintain river resources through partnerships and special events.
Monitoring	• BLM will assure that BBM outcomes and objectives are being met and setting prescriptions are being maintained through the administration of BBM visitor satisfaction surveys. • Using an adaptive management approach, BLM will monitor and evaluate whether identified standards are being maintained. Monitoring will be conducted using river patrols, river surveys, and visitor registration. Management actions (described in Chapter 2.4.2) will be implemented in response to monitored conditions.

IMPLEMENTATION FRAMEWORK DECISIONS	
Administrative	Special Rules for the river corridor will be developed in accordance with 43 CFR 8351.2-1 to address restrictions on travel management, group size, occupancy and use, chainsaw use and firewood gathering, recreational shooting, fireworks, supply caching, and disposal of human waste. **Travel Management:** The use of snowmachines and OHVs will only be permitted during periods of adequate snow cover (at least 6" of ground frost or 12" of snow cover). During June and July, motorized boating and airplane landings will be prohibited. During the closed season, subject to reasonable regulations and with BLM authorization, qualified rural residents may be permitted to use motorized boats or other means of surface transportation traditionally employed for subsistence purposes (ANILCA Sec. 811). Similarly, access via motorboats, airplanes and non-motorized surface transportation may also be permitted for traditional activities (ANILCA Sec 1110). Authorization may be obtained in person, by mail, online, and by phone from the BLM Glennallen Field Office. The operation of motorized boats and the landing of airplanes during the closed season would be allowed by State and Federal government agencies for emergency purposes. **Group Size:** Group sizes will be limited to a maximum of 10 people per campsite. Groups in excess of 10 people per campsite must obtain written authorization with special stipulations from BLM. **Occupancy and Use:** Camping will be limited to 14 consecutive days within the river corridor within any 60 day period. Designated campsites must be used when camping immediately adjacent to the lakes and river. Dispersed camping (away from the lakes and river) will be permitted when using Leave No Trace low impact camping methods. **Chainsaw Use and Firewood Gathering:** The use of chainsaws for campsite firewood will be prohibited. Only dead and down wood may be used for campfires. The cutting of green trees and vegetation will not be permitted. **Recreational Shooting:** The recreational discharge of weapons1 (i.e. target shooting or "plinking") will be prohibited. **Fireworks:** The use of fireworks will be prohibited. **Supply Caching:** The caching of supplies will only be allowed through written authorization with special stipulations from BLM. **Disposal of Human Waste:** Proper disposal of human wastes per Alaska Department of Environmental Conservation (ADEC) regulation 18 AAC 72.020 will be required. Commercial guides will be required to use portable toilets.

2.4.1.5 Alternative 2 -- Delta River Zone 5

Delta River Zone 5 includes the lower Delta River, downstream of the Garrett Creek confluence to the end of the river corridor at Black Rapids. The zone contains approximately 16,065 acres of BLM lands. The navigable portion of the lower river corridor, located between the confluences of Garrett Creek and Phelan Creek, is owned by the State of Alaska below the ordinary high water marks.

Map 8: Delta River Zone 5



Alternative 2 -- Delta River Zone 5

PRIMARY MARKET STRATEGY	PRIMARY MARKET
Destination	Motorized and nonmotorized boaters and OHV users from Alaska

NICHE DECISION
The zone provides opportunities for visitors to engage in motorized and nonmotorized recreational experiences within a naturally appearing landscape on the lower Delta River and surrounding uplands within the zone.
MANAGEMENT OBJECTIVE DECISION
The primary focus within the zone will be to manage and provide opportunities for visitors to engage in motorized and nonmotorized river boating and motorized OHV use on designated OHV trails. Recreational emphasis will be on providing a semiprimitive motorized experience in a naturally appearing landscape.

PRIMARY TARGETED OUTCOMES		
Activities	**Experiences**	**Benefits**
• motorized river boating • nonmotorized river boating • OHV use	• spending time with family and friends • teaching and developing outdoor skills • enjoying scenery and natural landscapes	• greater self-reliance and confidence • closer relationship with the natural world • gaining and developing outdoor skills

OUTCOMES TO BE AVOIDED		
Activities	**Experiences**	**Negative Benefits**
• OHV use off designated trails • OHVs larger than 2000 lbs. GVW	• negative impacts to scenery and natural landscapes • loss of cultural history caused by resource damage	• less self-reliance and confidence • decreased relationship with the natural world • loss of naturalness and increased disturbance to the area resources

SETTING CHARACTER DECISION – SEMIPRIMITIVE MOTORIZED		
Physical	**Social**	**Administrative**
Remoteness: The zone will be managed for a semiprimitive motorized experience, with a low to moderate concentration of users. **Naturalness:** The zone is natural in appearance, but may be within site of the Richardson Highway, OHV trails, or developed facilities that are located along the Richardson Highway. **Facilities:** Six primitive campsites will be designated for overnight use. A river takeout caution sign, boater registration kiosk, and river survey box will be located at the Mile 212.5 takeout on the Richardson Highway.	**Contacts:** Manage for 3-5 encounters per day on the weekend and 1-3 encounters per day during the week. **Group Size:** Manage for an average group size of 4-6 people. **Evidence of Use:** Minor evidence of use, including slight vegetation trampling at campsites, will be expected. OHV trails will be evident from the river in the surrounding viewshed.	**Mechanized Use:** Decisions regarding mechanized use are described below under *Travel Management*. **Management Controls:** Agency personnel will conduct field patrols approximately three times per season. **Visitor Services:** River patrol crews will make contact with river users and river surveys will be available at the Mile 212.5 Richardson Highway takeout.

IMPLEMENTATION FRAMEWORK DECISIONS	
Management	**Adaptive Management Actions:** Actions described in Chapter 2.4.2 for the management of litter, human waste, fire rings, campsite impacts, and private/commercial user capacity will be adopted. Impact levels will be monitored; if standards are exceeded, management actions will be implemented as described. **Special Recreation Permits (SRP):** Commercial group sizes will be limited to 10 people per campsite. Commercial guides will be required to use designated campsites and portable toilets. Competitive events may be authorized based on compatibility with specified ORVs for the zone. **Travel Management:** Designated OHV trails include the Top of the World/Yost Trail and the Rainy Creek Trail. Two unauthorized OHV trails at the confluence of Eureka Creek will be closed to OHV use and rehabilitated. Trail maintenance activities, including trail hardening and the creation of trail reroutes, may be used on designated OHV trails to eliminate trail braiding and resource impacts. Signs that identify OHV use limitations will be used to reinforce trail restrictions. BLM will monitor trails to ensure the protection of resources and compliance with trail restrictions. Education and enforcement will be used to help limit the proliferation of unauthorized trails. Nonmotorized trails may be designated and developed in the future in the Eureka Creek drainage. The use of pack animals, mechanized travel (e.g. mountain bikes) and dog mushing will be permitted for dispersed use throughout the zone and on the Top of the World/Yost and Rainy Creek Trails. There will be no restrictions on motorized boating or airplane landings. New airstrips will not be authorized within the zone. BLM will periodically monitor water quality (including petroleum hydrocarbons) within the zone. If measured petroleum hydrocarbon levels exceed State water quality standards, BLM will consider restrictions to meet the standards. **Facilities:** Facilities at the Mile 212.5 Richardson Highway takeout will include a boater registration kiosk, river survey box, and takeout warning sign. Access to the takeout downstream of Black Rapids will remain unimproved. Public use cabins will not be considered for development. **Education and Interpretation:** Information will be developed to inform and educate visitors about current river resource conditions, rules and regulations, recreational opportunities, and Leave No Trace low impact camping techniques. River crews will make contact with users to educate low impact camping and river ethics. The primary goal within this zone is to provide interpretation of area resources through self discovery.
Marketing	• Recreational opportunities within the zone will be marketed by providing information on the BLM website and BLM brochures. • User groups, communities, volunteers, and other interested parties may help to monitor and maintain river resources through partnerships and special events.
Monitoring	• BLM will assure that BBM outcomes and objectives are being met and setting prescriptions are being maintained through the administration of BBM visitor satisfaction surveys. • Using an adaptive management approach, BLM will monitor and evaluate whether identified standards are being maintained. Monitoring will be conducted using river patrols, river surveys, and visitor registration. Management actions (described in Chapter 2.4.2) will be implemented in response to monitored conditions.

IMPLEMENTATION FRAMEWORK DECISIONS	
Administrative	Special Rules for the river corridor will be developed in accordance with 43 CFR 8351.2-1 to address restrictions on travel management, group size, occupancy and use, chainsaw use and firewood gathering, recreational shooting, fireworks, supply caching, and disposal of human waste. **Travel Management:** OHVs must remain on designated OHV trails, and will not be allowed to operate off designated trails for any purposes (including game retrieval), except during periods of adequate snow cover (at least 6 inches of frost or 12 inches of snow cover). All OHVs will be limited to 2000 lbs. Gross Vehicle Weight (GVW). OHV restrictions apply to all users, including rural residents engaged in subsistence uses and those accessing the area for traditional activities (defined in ANILCA Sections 811 and 1110). Exceptions to the 2000 lb. GVW limitation may be permitted on a case-by-case basis for access to active mining claims via the Rainy Creek Trail and for rural residents engaged in subsistence uses who obtain prior authorization from BLM, Glennallen Field Office. Authorization may be obtained in person, by mail, online, and by phone from the BLM Glennallen Field Office. **Group Size:** Group sizes will be limited to a maximum of 10 people per campsite. Groups in excess of 10 people per campsite must obtain written authorization with special stipulations from BLM. **Occupancy and Use:** Camping will be limited to 14 consecutive days within the river corridor within any 60 day period. Designated campsites must be used when camping immediately adjacent to the lakes and river. Dispersed camping (away from the lakes and river) will be permitted when using Leave No Trace low impact camping methods. **Chainsaw Use and Firewood Gathering:** The use of chainsaws for campsite firewood will be prohibited. Only dead and down wood may be used for campfires. The cutting of green trees and vegetation will not be permitted. Chainsaws may be used for personal firewood and houselog gathering only through written authorization with special stipulations from BLM. **Recreational Shooting:** The recreational discharge of weapons1 (i.e. target shooting or “plinking”) will be prohibited. **Fireworks:** The use of fireworks will be prohibited. **Supply Caching:** The caching of supplies will only be allowed through written authorization with special stipulations from BLM. **Disposal of Human Waste:** Proper disposal of human wastes per Alaska Department of Environmental Conservation (ADEC) regulation 18 AAC 72.020 will be required. Commercial guides will be required to use portable toilets.

2.4.2 Alternative 2 -- Adaptive Management Actions

An adaptive management approach involves predicting the outcomes of actions based on current knowledge, monitoring to learn about the impacts of management actions, and then using the results to adjust management actions. Adaptive management focuses on learning and adapting, through partnerships of managers, scientists, and other stakeholders to create and maintain sustainable resource systems (Adaptive Management: The US Department of the Interior Technical Guide, Williams, B. K., R. C. Szaro, and C. D. Shapiro, 2007).

Adaptive management is used to prescribe the desired conditions for resources and visitor experiences for a given area by:

- Selecting specific indicators (i.e. qualities that reflect the overall condition) for resource and visitor experiences.
- Setting quantifiable standards against which the indicator is measured.
- Monitoring conditions on-the-ground.
- Management actions are triggered and implemented when standards are not being met.
- Continually improving and adjusting the program based on knowledge gained over time.

In some cases, if a management action fails to address unacceptable impacts; subsequent phases of management actions would be initiated to meet those standards. Between each set of phased management actions, monitoring would occur before moving to the next phase. If conditions improve over time, management actions can be reassessed and adapted to maintain desired conditions.

Adopting standards and management actions corridor-wide, rather than by each recreation management zone, helps to prevent confusion to the river user when specific management actions are implemented, and allows BLM to standardize educational and outreach efforts targeted at reducing the levels of impact and educating the public about new management actions. (Management actions within Tangle Lakes Developed Zone 3 will not be dependent upon an adaptive management approach of monitoring indicators and standards. Management actions within this zone affect the developed facilities, and will be instituted immediately as part of the developed facility supplemental rules and regulations).

For RMZs 1, 2, 4, and 5, selected indicators, standards, and phased management actions are identified. Phase 1 management actions will be implemented immediately upon plan approval. If monitoring results indicate that the standard is exceeded over the specified timeframe, Phase II management actions will be implemented as described. Monitoring will continue to occur for the specified time period before moving to the next subsequent phase, and management actions from the previous phases may continue, depending on effectiveness. If conditions improve in a particular phase and meet prescribed standards, management actions will continue as prescribed for that phase, and will not revert back to the previous phase.

The following adaptive management actions will be implemented on a corridor-wide basis within all recreation management zones (except for Tangle Lakes Developed Zone 3).

2.4.2.1 Litter

Indicator: Percentage of designated campsites at which litter occurs.

Standard: Less than 20% of designated campsites (13 sites) have litter present.

Monitoring: The monitoring of litter will be conducted by river patrol crews, recording the number of designated campsites visited and the number of these campsites with litter present, throughout the entire season. Percentages for each trip will be averaged for the season. If the standard is exceeded for two consecutive years (20% or more of campsites monitored have litter present), phased management actions will be implemented.

Phase I: Maintain existing BLM cleanup patrols (3 per season) and provide Leave No Trace (LNT) information at the boat launches and BLM website. Conduct visitor contacts at the boat launches and on the river, stopping at occupied campsites to educate proper litter disposal. Develop a volunteer program with commercial guides, local communities and river users to

assist with cleanup and monitoring needs. Involve user groups, volunteers, and other interested parties to help maintain resources through partnerships and special events.

Phase II: Add one additional BLM cleanup patrol (4 per season). Continue volunteer and educational component described under Phase I actions.

Phase III: Dismantle all fire rings, require all users to use fire pans and remove ash from the river corridor. (This action would address the problem of litter left behind in fire rings, which accounts for almost all of the litter found in the river corridor).

2.4.2.2 Human Waste

Indicator: Percentage of designated campsites that human waste (or toilet paper) is present.

Standard: Human waste present at less than 10% of designated campsites (7 sites).

Monitoring: The monitoring of human waste will be conducted by river patrol crews, recording the number of designated campsites visited and the number of campsites with visible human waste or toilet paper present, throughout the entire season. Percentages for each trip will be averaged for the season. If the standard is exceeded for two consecutive years (10% or more of campsites monitored have human waste or toilet paper present), phased management actions will be implemented.

Phase I: Maintain existing BLM cleanup patrols (3 per season) and provide LNT information at the boat launches and BLM website. Require commercial guides to use portable toilets. New outhouses will not be constructed. Conduct visitor contacts at the boat launches and on the river, stopping at occupied campsites to educate proper human waste disposal. Develop a volunteer program with commercial guides, local communities and river users to assist with cleanup and monitoring needs. Involve user groups, volunteers, and other interested parties to help maintain resources through partnerships and special events. Increase educational efforts by conducting LNT workshops with groups such as the Boy Scouts of America, Copper River Watershed Project and the Wrangell Institute for Science and Education. Publicize current state laws and regulations regarding the proper disposal of human waste: *Human waste shall not be disposed of on state-owned shorelands (such as gravel bars and sand bars), in accordance with AS 46.03.800 - 810. On all lands including state, federal and private, human waste may be disposed of in a cathole at least 100 feet away from the ordinary high water mark of streams, rivers, or lakes in accordance with Alaska Department of Environmental Conservation (ADEC) regulation 18 AAC 72.020.*

Phase II: Add one additional BLM cleanup patrol (4 per season). Continue volunteer and educational component described under Phase I management action.

Phase III: Require all users to use portable toilet systems and carry out human waste and toilet paper. The outhouse at the Delta River portage will be removed once a portable toilet cleanout facility is developed for waste disposal.

2.4.2.3 Fire Rings

Indicator: Number of fire rings per designated campsite.

Standard: Less than 20% of designated campsites (13 sites) with more than one fire ring.

Monitoring: The monitoring of fire rings will be conducted by river patrol crews, recording the number of designated campsites visited and the number of campsites with greater than one fire ring, throughout the entire season. Percentages for each trip will be averaged for the season. If the standard is exceeded for two consecutive years (20% or more of campsites monitored have greater than one fire ring), phased management actions will be implemented.

Phase I: River patrol crews would dismantle all but one fire ring per site and encourage the use of portable fire pans. The cutting of standing trees and the use of chainsaws for campsite firewood will be prohibited. Require the use of only dead and down firewood for campfires.

Phase II: Dismantle all fire rings and require all campers to use fire pans and remove ash from the river corridor. Continue restrictions related to wood cutting and collection.

2.4.2.4 Private and Commercial User Capacity

Indicator: Number of nights groups camp within sight or sound of other campers (camp encounter), pass up occupied designated campsites (camp competition), or share designated campsites due to campsites being occupied.

Standard: Less than 20% of nights.

Monitoring: Monitoring will be conducted through the administration of river surveys, overflights, and field patrols to document evidence of camp encounters, camp competition, and camp sharing. River surveys would be available at the launch sites and distributed during river patrol trips. Questionnaires would define and tally camp encounters, which would then be expressed as a weighted percentage (based on all river users for that season compared to river survey responses). If the standard is exceeded for two consecutive years (20% or more of nights that groups are required to camp within sight or sound of other campers (camp encounter), pass up occupied campsites (camp competition), or share campsites (due to campsites being occupied), phased management actions will be implemented.

Phase I: Designate campsites and develop a campsite map that will allow users to select campsites that will minimize camp encounters and camp competition. Prohibit the use of chainsaws for campsite firewood and recreational shooting to reduce noise related camp encounters. Limit group size to 10 people maximum per campsite. Groups in excess of 10 people per site must obtain written authorization that may include special stipulations from BLM. Monitor number of permitted commercial use permits and designate campsites for commercial groups. Development of additional campsites may be considered to accommodate increased use, especially in high concentration areas to relieve pressure on heavy use sites and to minimize camp encounters. Locations for new campsites would be chosen that would minimize camp encounters based on location and terrain.

Phase II: Institute a voluntary registration system for overnight trips. Potential voluntary systems could include a reservation board and a web-based registration system. Users plan their trip by reserving campsites on the board or on the web. Other users would be able to see available campsites and plan their trips accordingly. Use of the campsites would be first come, first served. These measures would enable visitors to avoid high use days and reduce campsite competition.

Phase III: Continue the voluntary registration system defined in Phase II, but registration would become mandatory, with no use limits or user fees.

Phase IV: Limit the number of overnight trips launching per day by implementing a mandatory permit system. A mandatory permit system would be developed through a public process consistent with existing laws, regulations, and policies.

2.4.2.5 Campsite Impacts

Indicator: Percentage of bare ground disturbance and density of social trails and satellite sites at designated campsites. Bare ground is determined using photopoint monitoring techniques and GPS analysis. All designated campsites were inventoried in 2006 and categorized as “heavy”, “moderate”, and “light” impact sites, depending on the level of bare ground disturbance, social trails, and satellite sites.

Standard: **Heavy impact sites:** These sites are heavily impacted (more than 66% of campsite area is impacted down to mineral soil), with more than one satellite site and social trail. Rehabilitation at these sites would be difficult without total rest for years; high use levels in these areas might also result in the creation of new campsites if these were closed.

S*tandard: no increase in bare ground on the river bank and no increase in satellite sites or social trails from the existing condition.*

Moderate impact sites: These are sites where passive rehabilitation or rest could make a large difference. Current area of bare ground is smaller than heavy impact sites, but has the potential to spread (between 34% and 65% of campsite area is impacted down to mineral soil). Moderate impact sites have up to one satellite site and one social trail.

Standard: less than 66% bare ground disturbance and no more than one satellite site or social trail.

Light impact sites: These are sites that are hard to find, even with a map, and have very little bare ground disturbance (between 0% and 33% of campsite area is impacted down to mineral soil). There are no associated satellite sites or social trails. These sites have the most potential for rehabilitation to their original, natural condition.

Standard: less than 33% bare ground disturbance and no new satellite sites or social trails.

Monitoring: A complete baseline inventory was conducted on all campsites in 2006, which consists of detailed sketches, measurements, inventory forms and digital photos of all sites. This information is supplemented with GPS data and estimates of bare ground at each campsite using photopoint monitoring techniques. Monitoring for newly developed campsites will occur annually. Measurement of existing designated campsites to determine trend in bare ground, satellite sites, and social trails will occur every five years. Phased actions will occur based on non-compliance with standards for each campsite category or change in site categorization level after five year monitoring period.

Phase I: Implement group size limit of 10 people per designated river campsite. Groups in excess of 10 people per site must obtain written authorization that may include special stipulations from BLM. Designate campsites and develop a campsite map. Development of additional campsites may be considered in high concentration areas to relieve pressure on heavy use campsites and to minimize camp encounters. Campsites will be monitored for distance from active eagle nests. If occupation of a campsite is causing disturbance, (i.e. adults displaced from nest, repeatedly leaving eggs or nestlings) the campsite will be closed.

Heavy impact sites: Close developing satellite sites and social trails using natural materials (e.g. trees, rocks, root wads, brush) to discourage use. Increase in bare ground on the riverbank will be minimized using passive rehabilitation, funneling use into one area. Native materials may be used to create natural steps to help prevent riverbank erosion.

Moderate impact sites: Use passive rehabilitation to halt expansion of core area and bare ground disturbance. Developing satellite sites and social trails will be discouraged using natural materials and passive rehabilitation.

Light impact sites: Same as described for moderate impact sites. If not indicated on the designated campsite map, or if it is newly developed site, temporarily close the campsite using passive rehabilitation and natural materials to block site visibility from the river.

Phase II: Groups in excess of 10 people will be prohibited in all designated river campsites.

Heavy impact sites: If satellite sites or social trails continue to develop, close them to allow for rest and rehabilitation by using physical barriers and signage.

Moderate impact sites: Where passive rehabilitation described under Phase I is not effective, temporarily close these campsites until bare ground has revegetated within site categorization standards.

Light impact sites Where passive rehabilitation described under Phase I is not effective, close designated campsites. Rehabilitate inactive or newly damaged sites using passive rehabilitation techniques until bare ground has revegetated.

2.5 Alternative 3

Alternative 3 has been developed to address scoping comments related to the desire for increased access and less use restrictions within the river corridor. Alternative 3 provides management for high density experiences, and emphasizes recreation facility development and increased maintenance to address high impact levels. Outstandingly Remarkable Values and associated management objectives would be adopted as described in *"Management Actions Common to Alternatives 2, 3, and 4."*

The RMZ boundaries, market strategy, niche and management objective decisions, primary targeted outcomes, and setting character decisions for each RMZ in Alternative 2 were developed based on information obtained during the BBM planning process meetings described in Chapter 1.8.1. Alternative 3 has been developed to retain these targeted BBM outcomes for each RMZ, but implementation framework decisions have been changed to provide for high density experiences, increased access, and facility development. Implementation framework decisions and adaptive management actions would be adopted as described:

2.5.1. Alternative 3 -- Tangle Lakes Zone 1

Management: Same as Alternative 2, except:

Special Recreation Permits

Commercial group sizes will be limited to 12 people per campsite, instead of 10. Commercial groups in excess of 12 people per campsite must obtain written authorization that may include special stipulations from BLM. Commercial groups will not be required to use portable toilets.

Travel Management

Portage trails will be marked and identified with signage and improved access will be provided through trail construction and maintenance activities using native materials (e.g. rocks, spruce).

Facilities

Developed day use facilities with metal fire rings and picnic tables will be installed at heavy use campsites. Public use cabins will be considered for development.

Education and Interpretation

River crews will focus efforts on cleanup and maintenance of campsites, portages, and facilities rather than educational outreach efforts.

Marketing: Same as Alternative 2, except recreational opportunities will be marketed to a wider audience using the BLM website, magazine articles, brochures, and outdoor shows.

Monitoring: Same as Alternative 2

Administrative: Same as Alternative 2, except:

Travel Management

There will be no restrictions on motorized boating or airplane landings.

Group Size

Group sizes will be limited to 12 people per campsite under Phase II campsite and user capacity management actions. Groups in excess of 12 people per campsite must obtain written authorization that may include special stipulations from BLM.

Chainsaw Use and Firewood Gathering

Chainsaw use for the cutting of campsite firewood will be permitted, including the cutting of standing dead wood at least 200 feet from the river's edge. The cutting of green trees and vegetation will not be permitted.

2.5.2 Alternative 3 -- Tangle Lakes Zone 2

Management: Same as Alternative 2, except:

Special Recreation Permits

Commercial group sizes will be limited to 12 people per campsite, instead of 10. Groups in excess of 12 people per site must obtain written authorization that may include special stipulations from BLM. Commercial groups will not be required to use portable toilets.

Travel Management

The Round Tangle Lake Trail and Mile 22 Denali Highway North Trail will be open to OHV use and designated as OHV trails. The portage trail will be marked and identified with signage and improved access will be provided through trail construction and maintenance activities using native materials (e.g. rocks, spruce).

Facilities

One outhouse and a boater registration kiosk will be installed at the first portage of the Upper Tangles. Developed day use facilities with metal fire rings and picnic tables will be installed at heavy use campsites. Public use cabins will be considered for development.

Education and Interpretation

River crews will focus efforts on cleanup and maintenance of campsites, portages, and facilities rather than educational outreach efforts.

Marketing: Same as Alternative 2, except recreational opportunities will be marketed to a wider audience using the BLM website, magazine articles, brochures, and outdoor shows.

Monitoring: Same as Alternative 2

Administrative: Same as Alternative 2, except:

Group Size

Group sizes will be limited to 12 people per campsite under Phase II campsite and user capacity management actions. Groups in excess of 12 people per campsite must obtain written authorization that may include special stipulations from BLM.

Chainsaw Use and Firewood Gathering

Chainsaw use for the cutting of campsite firewood will be permitted, including the cutting of standing dead wood at least 200 feet from the river's edge. The cutting of green trees and vegetation will not be permitted.

2.5.3 Alternative 3 -- Tangle Lakes Developed Zone 3

Management: Same as Alternative 2, except:

Special Recreation Permits

Commercial group sizes will be limited to 12 people per campsite, instead of 10.

Facilities

User fees would be implemented for the use of campground, boat launches, and for overnight parking at the DWSR Wayside. Public use cabins will be considered for development. An educational river portal facility or portable toilet cleanout facility will not be considered for development.

Marketing: Same as Alternative 2, except recreational opportunities will be marketed to a wider audience using the BLM website, magazine articles, brochures, and outdoor shows.

Monitoring: Same as Alternative 2

Administrative: Same as Alternative 2, except:

Group Size

Group sizes will be limited to 12 people per campsite, and 3 vehicles per campsite (one of which may be a recreational vehicle). Groups in excess of 12 people may camp in the designated group camping areas.

2.5.4 Alternative 3 -- Delta River Zone 4

Management: Same as Alternative 2, except:

Special Recreation Permits

Commercial group sizes will be limited to 12 people per campsite, instead of 10. Commercial groups in excess of 12 people per campsite must obtain written authorization that may include special stipulations from BLM. Commercial groups will not be required to use portable toilets.

Travel Management

Portage trails will be marked and identified with signage and improved access will be provided through trail construction and maintenance activities using native materials (e.g. rocks, spruce).

Facilities

Facility developments will include an outhouse, river survey box, portage warning signs, and boater registration kiosk. Public use cabins will be considered for development.

Education and Interpretation

River crews will focus efforts on cleanup and maintenance of campsites, portages, and facilities rather than educational outreach efforts.

Marketing: Same as Alternative 2, except recreational opportunities will be marketed to a wider audience using the BLM website, magazine articles, brochures, and outdoor shows.

Monitoring: Same as Alternative 2

Administrative: Same as Alternative 2, except:

Travel Management

There will be no restrictions on motorized boating or airplane landings.

Group Size

Group sizes will be limited to 12 people per campsite under Phase II campsite and user capacity management actions. Groups in excess of 12 people per campsite must obtain written authorization that may include special stipulations from BLM.

Chainsaw Use and Firewood Gathering

Chainsaw use for the cutting of campsite firewood will be permitted, including the cutting of standing dead wood at least 200 feet from the river's edge. The cutting of green trees and vegetation will not be permitted.

2.5.5 Alternative 3 -- Delta River Zone 5

Management: Same as Alternative 2, except:

Special Recreation Permits

Commercial group sizes will be limited to 12 people per campsite, instead of 10. Groups in excess of 12 people per site must obtain written authorization that may include special stipulations from BLM. Commercial groups will not be required to use portable toilets.

Travel Management

OHV trails at the confluence of Eureka Creek will be open to OHV use and designated as OHV trails.

Facilities

Metal fire rings and picnic tables would be installed at heavy use campsites. Public use cabins will be considered for development.

Education and Interpretation

River crews will focus efforts on cleanup and maintenance of campsites, portages, and facilities rather than educational outreach efforts.

Marketing: Same as Alternative 2, except recreational opportunities will be marketed to a wider audience using the BLM website, magazine articles, brochures, and outdoor shows.

Monitoring: Same as Alternative 2

Administrative: Same as Alternative 2, except:

Travel Management

OHVs will be allowed to travel off designated trails for game retrieval, and there will be no weight limitations for OHV use.

Group Size

Group sizes will be limited to 12 people per campsite under Phase II campsite and user capacity management actions. Groups in excess of 12 people per campsite must obtain written authorization that may include special stipulations from BLM.

Chainsaw Use and Firewood Gathering

Chainsaw use for the cutting of campsite firewood will be permitted, including the cutting of standing dead wood at least 200 feet from the river's edge. The cutting of green trees and vegetation will not be permitted.

2.5.6 Alternative 3 -- Adaptive Management Actions

2.5.6.1 Litter

Standard would not change from Alternative 2. Phase I and II management actions would be the same as Alternative 2. Under Phase III management actions, all users would be encouraged to pack out litter through education, but would not be required to use firepans to reduce litter in firerings.

2.5.6.2 Human Waste

Standard would not change from Alternative 2. Phase I management actions would be the same as

Alternative 2, except commercial guides would not be required to use portable toilets. Under Phase II management actions, one outhouse would be added in RMZ 2, located at the first portage in the Upper Tangles. The outhouse located at the river portage in RMZ 4 would remain and be maintained for use. River crew would add one additional cleanup patrol and continue educational efforts. Under Phase III management actions, all users would be encouraged to pack out human waste through education, but not required.

2.5.6.3 Fire Rings

Standard would not change from Alternative 2. Phase I management actions would be the same as Alternative 2, except that the cutting of standing dead wood and chainsaw use for the cutting of firewood for campsites would be permitted. Under Phase II management actions, metal fire rings would be installed at heavy use sites and sites with multiple fire rings. Firepans would not be required.

2.5.6.4 Private and Commercial User Capacity

The encounter standard would be relaxed from “less than 20% of nights” to “less than 40% of nights”, allowing for higher encounter levels before management actions are initiated. Under Phase I management actions, additional campsites would be developed within the river corridor. Campsites would be designated and a campsite map would be developed. Recreational shooting would be prohibited. Under Phase II management actions, a maximum group size limit of 12 people per campsite would be implemented. Groups in excess of 12 people per site must obtain written authorization that may include special stipulations from BLM. Under Phase III management actions, a voluntary registration system would be created, and users would be encouraged to register, but not required. Under Phase IV management actions, the voluntary registration system would progress to a mandatory registration system. There would be no Phase IV management action of implementing a formal mandatory permit system.

2.5.6.5 Campsite Impacts

Standard would not change from Alternative 2. Under Phase I management actions, existing campsite documentation efforts would continue and campsites would be designated and a campsite map would be developed. Campsites would be developed in new areas and existing moderate and heavy impact campsites would be hardened and expanded to accommodate larger groups and increased use levels. Light impact campsites would be allowed to become moderate impact sites before hardening and expansion. Under Phase II management actions, the maximum group size limit would be 12 people per campsite, instead of 10. Groups in excess of 12 people per site must obtain written authorization that may include special stipulations from BLM. Under Phase II management actions, campsites would be maintained, and rehabilitation, rest, or closure would only be used if resource damage (ie. erosion, sedimentation) is occurring at campsites. Campsites would then be rehabilitated using passive rehabilitation and signage to discourage use.

2.6 Alternative 4

Alternative 4 proposes more restrictions on use or types of recreation behavior to provide management options for low density recreational experiences. Alternative 4 was also developed to address scoping comments related to the desire to preserve primitive and semiprimitive environments within the river corridor, and to retain and enhance existing wilderness characteristics, natural quiet and natural sounds. Outstandingly Remarkable Values and associated management objectives would be adopted as described in *"Management Actions Common to Alternatives 2, 3, and 4."*

The RMZ boundaries, market strategy, niche and management objective decisions, primary targeted outcomes, and setting character decisions for each RMZ in Alternative 2 were developed based on information obtained during the BBM planning process meetings described in Chapter 1.8.1. Alternative 4 has been developed to retain these targeted BBM outcomes for each RMZ, but implementation framework decisions have been changed to provide for low density experiences with less facility development. Implementation framework decisions and adaptive management actions would be adopted as described:

2.6.1. Alternative 4 -- Tangle Lakes Zone 1

Management: Same as Alternative 2, except:

Special Recreation Permits

Commercial group sizes will be limited to 8 people per campsite, instead of 10. Commercial groups in excess of 8 people per campsite must obtain written authorization that may include special stipulations from BLM. Competitive events will not be authorized.

Marketing: Same as Alternative 2

Monitoring: Same as Alternative 2

Administrative: Same as Alternative 2, except:

Travel Management

All recreational motorized boating will be prohibited. Motorized boating for subsistence use and access for traditional activities (described in ANILCA Sections 811 and 1110) will be limited to 35 horsepower motors, and airboats and hovercraft will be prohibited. All airplane landings will be prohibited, except for emergency operations.

Group Size

Group sizes will be limited to 8 people per campsite. Groups in excess of 8 people per campsite must obtain written authorization that may include special stipulations from BLM.

2.6.2 Alternative 4 -- Tangle Lakes Zone 2

Management: Same as Alternative 2, except:

Special Recreation Permits

Commercial group sizes will be limited to 8 people per campsite, instead of 10. Commercial groups in excess of 8 people per site must obtain written authorization that may include special stipulations from BLM. Competitive events will not be authorized.

Travel Management

Only the Lower Tangles Ridge Trail will be developed and designated as a nonmotorized trail.

Education and Interpretation

Interpretive displays will not be installed on nonmotorized trails.

Marketing: Same as Alternative 2

Monitoring: Same as Alternative 2

Administrative: Same as Alternative 2, except:

Travel Management

All motorized boating will be limited to 65 horsepower motors, and airboats, hovercraft and personal watercraft (jetskis) will be prohibited. All airplane landings will be prohibited, except for emergency operations. The use of pack animals and mechanized travel (mountain bikes) will not be permitted on the Lower Tangles Ridge Trail.

Group Size

Group sizes will be limited to 8 people per campsite. Groups in excess of 8 people per campsite must obtain written authorization that may include special stipulations from BLM.

2.6.3 Alternative 4 -- Tangle Lakes Developed Zone 3

Management: Same as Alternative 2, except:

Campsite Impacts

Walk-in campsites from the campground to locations along Round Tangle Lake and the Tangle River will not be considered for development.

Special Recreation Permits

Commercial group sizes will be limited to 8 people per campsite, instead of 10. Competitive events will not be authorized.

Facilities

Facility developments will be limited to the campground renovation only. User fees would be implemented for the use of campground only.

Marketing: Same as Alternative 2

Monitoring: Same as Alternative 2

Administrative: Same as Alternative 2, except:

Group Size

Group sizes will be limited to 8 people per campsite, and 2 vehicles per campsite (one of which may be a recreational vehicle). Groups in excess of 8 people may camp in the designated group camping areas.

2.6.4 Alternative 4 -- Delta River Zone 4

Management: Same as Alternative 2, except:

Special Recreation Permits

Commercial group sizes will be limited to 8 people per campsite, instead of 10. Commercial groups in excess of 8 people per campsite must obtain written authorization that may include special stipulations from BLM.

Competitive events will not be authorized.

Travel Management

Additional nonmotorized trails would not be developed in the future in the Garrett Creek drainage.

Facilities

All existing facility developments would be removed. Outhouse will be removed if portable toilets are required in the future and a cleanout facility is developed.

Marketing: Same as Alternative 2

Monitoring: Same as Alternative 2

Administrative: Same as Alternative 2, except:

Travel Management

All recreational motorized boating will be prohibited. Motorized boating for subsistence use and access for traditional activities (described in ANILCA Sections 811 and 1110) will be limited to 65 horsepower motors, and airboats and hovercraft will be prohibited. All airplane landings will be prohibited, except for emergency operations.

Group Size

Group sizes will be limited to 8 people per campsite. Groups in excess of 8 people per campsite must obtain written authorization that may include special stipulations from BLM.

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2.6.5 Alternative 4 -- Delta River Zone 5

Management: Same as Alternative 2, except:

Special Recreation Permits

Commercial group sizes will be limited to 8 people per campsite, instead of 10. Groups in excess of 8 people per site must obtain written authorization that may include special stipulations from BLM. Competitive events will not be authorized.

Travel Management

Additional nonmotorized trails would not be developed in the future in the Eureka Creek drainage.

Facilities

No facility developments will be identified. Takeout warning sign would be removed at the Mile 212.5 Richardson Highway takeout.

Marketing: Same as Alternative 2

Monitoring: Same as Alternative 2

Administrative: Same as Alternative 2, except:

Travel Management

OHVs will be required to park out of sight of the river. All motorized boating will be limited to 65 horsepower motors and airboats and hovercraft will be prohibited. All airplane landings will be prohibited, except for emergency operations.

Group Size

Group sizes will be limited to 8 people per campsite. Groups in excess of 8 people per campsite must obtain written authorization that may include special stipulations from BLM.

2.6.6 Alternative 4 -- Adaptive Management Actions

2.6.6.1 Litter

Standard would not change from Alternative 2. One additional crew patrol would be added under Phase I management actions, instead of Phase II. Firepans would be required as a Phase II management action, instead of Phase III. Educational component described in Alternative 2 would occur in all management phases.

2.6.6.2 Human Waste

Standard would not change from Alternative 2. Phase I management actions would be the same as Alternative 2. The use of portable toilets would be required under Phase II management actions, instead of Phase III. The outhouse at the Delta River portage would be removed when the installation of a portable toilet cleanout facility is developed. Educational component described in Alternative 2 would occur in all management phases.

2.6.6.3 Fire Rings

Standard would not change from Alternative 2. Phase I and Phase II management actions would be the same as Alternative 2.

2.6.6.4 Private and Commercial User Capacity

The encounter standard would be raised from “less than 20% of nights” to “less than 10% of nights.” Phase I management actions would include developing a campsite map, designating campsites, implementing a group size limit of 8 people per campsite, and prohibiting the use of chainsaws and recreational shooting. Groups in excess of 8 people per site must obtain written authorization that may include special stipulations from BLM. Under Phase II management actions, the voluntary registration system would be eliminated, and would be replaced by a mandatory registration system. A mandatory permit system would be implemented during Phase III, instead of Phase IV. No new campsites would be created within the management zone under any management scenario.

2.6.6.5 Campsite Impacts

Standard would not change from Alternative 2. Phase I management actions would be the same as Alternative 2, except that no new campsites would be created and group size would be limited to 8 people per campsite, instead of 10. Groups in excess of 8 people per site must obtain written authorization that may include special stipulations from BLM. Under Phase II actions, management actions would be the same as Alternative 2, except groups in excess of 8 people would be prohibited in designated river campsites.

3.0 AFFECTED ENVIRONMENT

A description of the affected environment provides a baseline for the comparison of environmental impacts presented in Chapter 4.

3.1 River Corridor Description and General Setting

The Delta River watershed is located in the heart of the Alaska Range, draining an area of about 150,000 acres, and contains a network of 160 miles of streams and more than 20 lakes. The Tangle River flows through and connects several lakes in the Tangles Lakes system, then drains into the Delta River, running clear until its confluence with Eureka Creek where it becomes a braided, glacial river. The Delta River then flows north through the Alaska Range and joins the Tanana River, which ultimately flows into the Yukon River and Bering Sea.

The terrain around the Tangle Lakes is predominantly tundra-covered rolling hills with glacial features that include moraines, esker ridges, and numerous kettle ponds. Gravel benches above many of the lakes indicate that the lake was at one time about 50 feet higher than the current level. The land adjacent to the lower Delta River corridor includes steep alluvial slopes, rock cliffs, and spectacular geologic features. Elevations average 2,800 feet at the Tangle Lakes, after which the drainage falls 650 feet in 51 river miles. The planning area is located within the continental climate zone of interior Alaska. The seasons are characterized by long, severe winters and short, mild summers. Winter temperatures generally range from -40° F to +30° F, with summer temperatures ranging from 35° F to 70° F, with occasional highs exceeding 80° F. Mean annual snowfall is approximately 110 inches. Short summer showers occur frequently in the area. The autumn freeze usually occurs in October, and the spring thaw normally comes in late May or early June.

The Richardson Highway parallels the Delta River from Phelan Creek to the northern river corridor boundary which terminates just downstream of Black Rapids. The highway is within site from the river throughout this portion. The utility corridor paralleling the Delta River in this portion was established as a route for the Trans Alaska Pipeline System (TAPS). Subsequent uses of the utility corridor may include additional pipelines and power transmission lines.

3.2 Affected Resources and Issues for Analysis

The following is a list of resources and issues that have been identified as possibly being affected by the proposed action and alternatives. Affected resources and issues will be analyzed if they are potentially significant and if they lead to a basis for a choice among the alternatives. The following discussion of the affected environment is based on the issues identified in Chapter 1. The impacts of the proposed action and alternatives, including cumulative effects related to these issues, are discussed in Chapter 4.

3.2.1 Climate Change

The Intergovernmental Panel on Climate Change (IPCC) recently concluded that “warming of the climate system is unequivocal” and “most of the observed increase in globally average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations” (IPCC 2007). Evidence is emerging that climate warming in Alaska can be linked to changes occurring in the structure and function of terrestrial ecosystems throughout the State of Alaska. Long term datasets indicate increasing annual mean temperature and annual precipitation (Hinzman et al. 2005). Through many complex interactions on a regional and global scale, the lower layers of the atmosphere experience a net warming effect. From 1954 to 2003, the average annual atmospheric surface temperatures in the Alaska region have risen, ranging from 2 to 3 degrees Celsius. Observed changes include warming of permafrost, increased water temperature, altering of the ranges of some species, and changes in disturbance regimes like fire and insect outbreaks in Alaska (McGuire 2003). Other observations include an increase in river discharge with the spring runoff occurring earlier and a decrease in snow cover by 5-10% since 1972. All of these changes are attributed to an increase in overall global temperature (ACIA 2005).

Much of the discontinuous permafrost in Alaska is both warm and ice-rich, making it highly susceptible to thermal degradation if regional warming continues. In the slightly warmer regions of the subarctic, the permafrost is thinner or discontinuous. As permafrost becomes even thinner, proportions of groundwater input to streams will increase, and the proportion of surface runoff will decrease, increasing river and lake temperatures and altering chemical properties (Hinzman et al. 2005). On a localized scale, changes to permafrost and increasing groundwater input may lead to increased river bank erosion and increased impacts to trails due to permafrost melting. In permafrost free areas, surface soils can be quite dry because infiltration is not restricted, impacting ecosystem dynamics and increasing fire frequency.

Climate change may contribute to changes in stream systems, such as flow, temperature, and turbidity. Climate change affects the water cycle through variation in snow pack, runoff timing, and changes to total runoff volumes. Hydrological processes impacted by degrading permafrost include gradual or catastrophic drainage of lakes (Yoshikawa and Hinzman, 2003), increased winter stream flows (Bolton et al., 2000), decreased summer peak flows (Bolton et al., 2000), and changes in stream water chemistry (Petrone et al., 2000). Changes in runoff volumes and timing may result in an increase of surface soil erosion beyond current levels, increasing stream sedimentation, erosion, or alteration of stream channels. Changes in climate can also influence the timing and length of seasons, including changes in ranges, abundances, phenology (timing of an event such as breeding), morphology and physiology, community composition, biotic interactions and behaviors. Changes are being seen in all different types of taxa, from insects to mammals, in North America as well as on many other continents.

3.2.2 Cultural Resources

The Native Alaskan and Euro-American prehistory and history of the Northern Copper River Basin, specifically the Tangle Lakes and the DNWSR corridor, has been archaeologically and historically investigated by a variety of researchers since the late 1950's. The result has been a relatively rich picture of the area's prehistory and history based upon one of the largest and densest cluster of archaeological sites in this part of Alaska. Many of these sites, and almost all of those within the Tangle Lakes Archaeological District (TLAD), are considered to be eligible for the National Register of Historic Places as contributing properties to the archaeological district. That portion of DWSR within TLAD is one of the densest areas for late Pleistocene and early Holocene archaeological sites in the North American Subarctic, making the area significant for answering questions about the poorly known early peoples who migrated to Alaska (Bowers 1989).

The Tangle Lakes and the DWSR corridor have several commonly recognized Ahtna Athabascan placenames, some of which are significant to the Ahtna as trail and travel markers, as well as ties to their ancestors (Kari and Tuttle 2005). Because of the extensive use of the area by the Ahtna historically, as well as the commonly recognized prehistory of the area, the region remains important to the Ahtna as a place that is a tie to some of their most distant ancestors. For example, the southern portions of the Tangle Lakes are understood as the origin place for one of their oldest clans, and has a frequently told clan origin story associated with the area. Any organized use of, or development of the Tangle Lakes and upper DWSR corridor, could affect areas that have religious and cultural importance to the Ahtna.

Cultural resource sites in the planning area include prehistoric and historic trails, temporary camps, habitation sites, game spotting vantage points, butchering sites and stone procurement locations. These sites include a variety of stone tools from several time periods, including wedge shaped microblade cores, core tablets, microblades, leaf shaped biface knives, notched cobbles, and side notched projectile points. Other common stone implements found in the area include end scrapers, large bifaces, exhausted cores and lithic reduction debitage.

3.2.2.1 Cultural Resources Concerns Related to Recreational Activities

Although the Delta River and Tangle Lakes region has received a large portion of the archaeological work conducted by BLM, the area also has large inventory gaps. Little is known about prehistoric subsistence and travel patterns between the Copper River Basin and the Tanana Valley to the north. Archaeological surveys within the Tangle Lakes and along the upper Delta River in 2007 and 2008 (Jangala et al 2009) yielded a large number of newly discovered sites that hint at the importance of the region for past subsistence and long distance travel.

Beyond gaps in inventories and archaeological knowledge, there are three major threats and one minor threat to cultural resources within the planning area. Since the addition of the TLAD to the National Register of Historic Places in 1972, there has been an increase in both OHV use and trail impacts to archaeological sites in this area. These increases have removed some of the vital vegetative cover from the thin, fragile soils covering several recorded sites spanning virtually the entire Holocene. In response to this problem, BLM has used experimental trail hardening materials in those areas with wet soils that are not able to withstand the weight and traffic to which they have been exposed. The trail hardening would also attempt to discourage the user-created braided trail patterns that have developed in these wet areas. BLM has also increased signage along both designated and non-designated trails.

The second threat to heritage resources within the region is the natural decay and disturbance of sites. There are several cabins and cabin remains that have naturally decayed and collapsed, with no possibility of reconstruction. Other prehistoric archaeological sites along bluff faces are threatened by natural erosion and calving of large portions of unstable bluff faces.

The third threat to cultural resources in the region is vandalism and looting. There have been two known looting incidents in the TLAD. BLM is attempting to lessen the risk of looting and vandalism through periodic monitoring.

The fourth threat to cultural resources has been the unintentional disturbance of archaeological sites by recreational camping. Several archaeological sites along Long Tangle and Lower Tangle Lakes are used as camping spots by river users. The majority of these users do not recognize the archaeological remains beneath these camps, and there has not been a problem with artifact collecting. However, the expansion of these campsites has the potential to uncover sites that are currently buried and covered by vegetation, exposing them to soil erosion and loss of archaeological context and National Register significance.

3.2.3 Fisheries

The clear water of the Delta River from the Upper Tangle Lakes to the confluence with Eureka Creek supports only resident fish species. Resident fish species use this section of the Delta River for migration, spawning and rearing. Species include: arctic grayling (*Thymallus arcticus*); lake trout (Salvelinus namaycush); round whitefish (Prosopium cylindraceum); burbot (Lota lota); and long nosed suckers (Catastomus catastomus) (Carlton, 1976). Arctic grayling are considered the most widespread and prevalent species within the drainage. Arctic grayling constitute the majority of the sports catch (BLM 1983).

The high quality of the fish habitat of the clear water Delta River is a basic factor contributing to the productivity of the river's fisheries. The river drainage contains a good mixture of gravelly riffles for spawning, rocky bottom runs for summer arctic grayling habitat, deep water areas for overwintering, and pools, backwaters, and lakes for rearing. The productivity of the river's fisheries creates excellent fishing opportunities for recreationists and anglers who use the river.

3.2.3.1 Resident Fish Populations

The arctic grayling (*Thymallus arcticus*) is common throughout Alaska. According to a preliminary survey by the Alaska Department of Fish and Game, the Delta River supports a very healthy, world class, resident arctic grayling population. The arctic grayling is widespread throughout the clear water system focusing on free flowing reaches of runs and riffles. It has been observed that large arctic grayling typically take up positions just below the falls in the swifter moving currents. Arctic grayling spawn early in the spring, immediately after breakup (James E. Morrow, 1983). Arctic grayling eggs hatch in two to four weeks and immediately migrate into deep pools and protected areas for rearing (Vincent-Lang, et al, 1990).

The lake trout (*Salvelinus namaycush*) are widely distributed in Alaska and northern North America. On the Delta River clear water system, the lake trout spawns in the lakes in the fall starting in early September (ADF&G biologist, professional judgement). Eggs hatch in early spring (March) and most

growth of the young fry occurs during the summer when food sources are abundant. Lake trout are not considered to be migratory.

The round whitefish (*Prosopium cylindraceum*) are found throughout mainland Alaska (James E. Morrow, 1983). On the clear water of the Delta River, spawning occurs in late September through October (ADF&G biologist, professional judgement). Eggs hatch in the early spring and growth rates of the fry vary depending on location and food conditions. It is not known if round whitefish are migratory, but it is suspected that they are not.

The burbot (*Lota lota*) are abundant through most of Alaska. Burbot are winter spawners, laying their eggs in early February. Fry are hatched in May, with variable growth rates during the summer. Migration for burbot is unknown.

The longnose sucker (*Catostomus catostomus)* are present throughout Alaska (James E. Morrow, 1983). Spawning for the longnose sucker begins in early May and eggs are laid in late May and early June. Fry are hatched starting in the middle of June and growth rates correlate with available food supply. Migration of the longnose sucker is unknown.

None of these species are commercially used. Arctic grayling and lake trout are a specific target sport fish species for fishing guides and recreational fishermen. Lake trout and burbot may be vulnerable to potential overharvesting.

3.2.3.2 Fisheries Concerns Related to Recreational Activities

The primary management concerns related to fisheries are sedimentation caused by OHV trails and river crossings, and bank erosion and river bed disturbance caused by motorized boating. The Top of the World Trail is the only designated OHV trail accessing and crossing the Delta River directly through the river channel in the clear water portion of the river corridor. It is primarily used by OHVs during hunting season, and crosses the river a few miles above Eureka Creek. OHV trails that parallel the river and OHV river crossings can adversely affect riparian vegetation, rate of erosion and sedimentation, and streambank stability in sensitive riparian areas that are vital fisheries habitat. Damage to riparian areas from OHVs can last for years and sedimentation in streams can damage fish habitat downstream from the original disturbance. Unauthorized trails that parallel the river and stream crossings typically have insufficient drainage structures and sometimes negotiate steep slopes, resulting in physical impacts to streambanks and riparian vegetation, uncontrolled runoff, and are a point where sediment from the trail is introduced into the river.

Removing the vegetative cover, altering the natural topsoil, or changing the shape of the slope can increase the potential for erosion, increase runoff, and create more sediment in waterbodies. Accelerated erosion occurs whenever the soil surface is disturbed. Sediments created by accelerated erosion clog streams and fill lakes and impair the water holding capacity. Erosion decreases the productive value of the soil as well as reducing the quality of the waters that receive the sediment. These changes can lead to decreased survival of fish in the egg and alevin stages; decreased density, biomass, and diversity of aquatic insects; and decreased primary production (Cordone and Kelley 1961; Cooper 1965; Van Nieuwenhuyse 1983; Webber and Post 1985; Lloyd and others 1987; Buhl and Hamiltion 1990).

Direct threats to Arctic grayling from sediment include changes to physical habitat, subsequent decreased reproductive success, and loss of rearing habitat. Physical habitat changes from sediments are most often attributed to finer size particles. Developing eggs can be smothered and newly hatched fry can be killed by sediment that prevents emergence from spawning gravels and interferes with respiration. Developing fish eggs and larvae need a constant supply of cold, oxygen rich water which flows through the interstitial spaces in stream gravels. Embedded sediments fill these interstitial spaces and limit essential winter habitat used by juvenile fish for cover from predators, ice scour, and high velocity stream flows. The filling of pools with sediment further limits overwintering sites for juvenile and adult fish.

Motorized boating increases have the potential for bank erosion and sedimentation into the river, resulting in a reduced quality of fisheries habitat. The bank stabilizing function of streamside vegetation not only helps reduce erosion and influence channel morphology, but also acts to supplement instream cover by the development of undercut streambanks and by providing overhanging vegetation. Well vegetated

stream channels and stable streambanks help reduce turbidity and channel scouring resulting from high runoff rates and, in turn, can enhance primary production. In cold regions, well vegetated stream channels help reduce the formation of aufeis (ice formed by the overflow of water onto existing ice). Aufeis can decrease primary productivity, delay riparian plant growth, increase erosion, tie up water in the form of ice during critical low flow periods, and cause the formation of new stream channels due to channel blockage (Churchill 1990; Michel 1971; Slaughter 1990).

Motorized boat usage on the DWSR is believed to be low, of the 560 boats observed on overflights from 2000 to 2004, 25% were motorized. However, the majority (71 %) of boating occurring in RMZ 5 is motorized; additionally the highest densities of Arctic graying (≥ 270 mm length) ever recorded were recently documented in RMZs 4 and 5 (Gryska, in preparation). The erosion of streambanks and lake shorelines caused by excessive boat wakes may pose a number of harmful effects on the aquatic environment. Wakes or waves generated by passing boats strike streambanks and shorelines with surprising force and wash away the soil and vegetation as wave energy is dissipated on the beach. A number of factors contribute to the size of a wake or wave generated by a moving boat. Among these are the size of the channel being traversed, distance from the shore, vessel speed, the condition and shape of the propeller, passenger load, and hull shape.

Damage caused by a wake is directly related to its height. Boat wakes are found to increase in amplitude with increasing boat size. Comparisons of streamflow and boat wake energy suggest that, in larger channels, boat wakes only make up 2-5% of the total energy dissipated annually against the banks. In smaller channels, the roles are reversed, and streamflow makes up only 2-5% of the annual energy dissipated, demonstrating that boat wakes in smaller channels may constitute far great energy on smaller channels than larger channels. Turbidity measurements clearly demonstrate that boat wakes are capable of dislodging sediments from the banks. Peak values of suspended sediment concentrations far outweigh the ambient load of the river and are found to increase with increasing wake height (Hill et al., 2002). Currently there is no data available for bank erosion rates and sedimentation from motorized boating on the DWSR.

3.2.4 Lands and Realty

3.2.4.1 Access

Access issues discussed in this section apply to minerals access and right-of-way authorizations for the transportation and utility corridor (PLO 5150). Access issues related to travel management and subsistence are discussed under their own general headings.

3.2.4.1.1 Mineral Access

The area has a history of mining beginning with the discovery of gold in Valdez Creek in 1903. Historic mining activities and associated trails dating from circa 1900 have been documented in the planning area. Mining interest has continued to this day, as there are federal and state mining claims on Rainy Creek and further west in the Eureka Creek drainage and Broxson Gulch.

For a description of trails in the DWSR corridor that have been historically used for mining access, refer to the Travel Management description for the Top of the World/Yost Trail and Rainy Creek Trail in Chapter 3.10.2.

3.2.4.1.2 Transportation and Utility Corridors

The Transportation and Utility Corridor, withdrawn by PLO 5150 in December of 1971, is primarily identified with the Trans Alaska Oil Pipeline System (TAPS), but is also reserved as a utility and transportation corridor in aid of programs for the U.S. government, as well as the State of Alaska. Future pipeline needs (such as a natural gas pipeline) could be accommodated along this existing route. Application for a right of way in the Transportation and Utility Corridor would require the appropriate level of site-specific analysis, and would be considered using the criteria described in Title XI of ANILCA.

In accordance with the provisions of the WSRA and Title XI of ANILCA, new transportation and utility systems may be permitted within WSR corridors. ANILCA Sections 1104 and 1105 provide applicable standards for granting such authorizations. In addition to the consideration of the factors set forth in Section 1104 (g) (2), such an authorization would be granted if (1) it is in the public interest; (2) it would be compatible with WSR values for which the subject river involved was established; and (3) there is no economically feasible and prudent alternative route or location. Road construction would be avoided in all segments of the river, but overland transportation systems within or across the river corridor may be authorized if it is determined that there are no economically feasible and prudent alternative routes. Any road crossings of the river would be subject to evaluation consistent with Section 7 of the WSRA.

3.2.4.2 Property Acquisition

There are approximately 30 acres of private lands within the DWSR corridor. If these parcels become available for sale, BLM may submit funding requests through the Land and Water Conservation Fund (LWCF) to acquire lands. The LWCF program provides funding for the acquisition and development of public outdoor recreation areas and facilities. The program is intended to create and maintain a nationwide legacy of high quality recreation areas and facilities, and stimulate investments in the protection and maintenance of recreation resources throughout the United States. The EARMP specified that the DWSR corridor would be an emphasis area for the acquisition of private lands through purchase or exchange for the purposes of long-term Federal management and retention. The only private parcels located within the DWSR corridor are in the vicinity of the Tangle Lakes Campground and DWSR Wayside, adjacent to the Denali Highway. In the past, these parcels have been available for sale and BLM has considered purchasing these parcels through the LWCF program, but formal LWCF proposals have not been submitted.

3.2.5 Natural Quiet and Natural Sounds

By definition, noise is a human-caused sound and may be considered unpleasant, depending on the individual "listening" to the sound, and what the individual is doing when the sound is heard (i.e., working, playing, resting, sleeping). While performing certain tasks, people expect and accept certain sounds. For instance, if a person works in an office, sounds from printers, copiers, and typewriters are generally acceptable and not considered unpleasant or unwanted. By comparison, when resting or relaxing, these same sounds are not desired. The desired sounds during these times are referred to as "natural quiet," a term used to describe ambient (outdoor) natural sounds, without the intrusion of human-caused sounds. Natural quiet can be essential in order for some individuals to achieve a feeling of peace and solitude.

3.2.5.1 Existing Noise Sources

Noise resulting from human activities primarily occurs during the summer months in the developed facilities, but also in areas where OHV use and motorized boating are common throughout the river corridor. Noise associated with visitor use typically involves talking or yelling, setting up camp, the use of chainsaws, rifles, and other camp amenities (generators, radios, etc.), OHV use, aircraft use, and motorized boating. Noise of this type varies greatly depending on group size and group demographics. Noise from motor vehicles is "loudest" immediately adjacent to the roadways, but due to generally low background sound levels, can be audible a long distance from these areas. Atmospheric conditions (such as wind, temperature, humidity, rain, fog, and snow) and topography can significantly affect the presence or absence of motor vehicle noise. Logically, noise levels will be "loudest" where and when activity levels are the greatest and nearest to the area.

Noise associated with aircraft occurs from different types of aircraft that are used within and adjacent to the river corridor. Occasionally, floatplanes will land on the larger lakes within the river corridor for the purpose of transporting fishermen and hunters. BLM uses fixed wing airplanes to monitor visitor use and wildlife. Helicopters are occasionally used by State agencies and BLM for logistical support in various resource projects; and helicopter use related to mining activities located adjacent to the river corridor has been increasing in recent years. The US Air Force conducts military flight operations in the FOX Military Operations Area (MOA), which is located adjacent to the river corridor, for military flight activities such as air combat tactics, transition, formation training, and aerobatics.

3.2.5.2 Existing Natural Sounds

Natural sounds within the DWSR corridor result from natural sources such as waterfalls, flowing water, animals, and rustling leaves. Some people seek this type of solitude, and are concerned that additional sources of noise may change this experience, and that certain areas should be managed to preserve existing natural quiet and natural sounds.

3.2.6 Recreation Resources

The Record of Decision for the EARMP identified specific management decisions for recreation resources in the planning area. These management decisions will serve as a guideline for new decisions that will be made to ensure conformity with the EARMP. These decisions can be found in Chapter 1.7 Relationship to Laws, Regulations, Statutes, and other Policies.

3.2.6.1 General Recreation Setting

The Tangle Lakes Campground at Mile 21 on the Denali Highway provides developed camping facilities and boat launch access to the lower Tangle Lakes and Delta River. A day use area and boat launch is also located at the DWSR Wayside at Mile 22 on the Denali Highway. This boat launch provides access to the Upper Tangle Lakes and Tangle River. A one mile portage from Upper Tangle Lakes to Dickey Lake provides access to the floatable headwaters of the Gulkana River drainage. Two commercial lodges in the area provide food, gas, and lodging.

Aside from the developed facilities that are located adjacent to the Denali Highway, there are no other developed facilities within the river corridor. BLM maintains only one outhouse on the entire river system, located at the Delta River portage. Dispersed campsites can be found along the river and lakes; a BLM inventory in 2005 identified 66 dispersed campsites. With the exception of a few campsites on the Tangle Lakes and lower Delta River, campsites are infrequently used, and traces of use are minimal. Within the river corridor, BLM manages two designated OHV trails. Floatplanes occasionally land on some of the larger lakes in the Tangle Lake system.

3.2.6.2 Recreation Activities and Use

Prior to construction of the Denali Highway in the early 1950's, the DWSR corridor was not easily accessible to highway vehicles. Recreation use of the area began in earnest in 1952, with the construction of the Denali Highway, and after the development of two private lodges and the Tangle Lakes Campground. Use increased substantially in the 1970’s in response to the nearby construction of the TAPS. Recent use is primarily by Alaska residents, although out-of-state visitation has increased. Local community dependence on lands within the DWSR corridor has strong ties to the utilization of the region's hunting and fishing resources. In addition to the resident population, regional urban populations also depend on river resources to pursue recreational activities.

Common recreational activities include fishing, hunting, trapping, berry picking, wildlife viewing, photography, boating, hiking, camping, snowmachining, and OHV travel. Hiking and camping opportunities are abundant, as relatively sparse vegetation and gravelly soils along exposed esker ridges help to facilitate dispersed hiking and camping opportunities. The majority of recreational use occurs near the lakes and on the river, with smaller numbers entering the lower river corridor by OHV.

The Delta River and Tangle Lakes provide exceptional fishing opportunities for arctic grayling and lake trout. Wildlife and bird habitat are also an important aspect within the river corridor, providing abundant hunting, trapping, and wildlife viewing opportunities. Some commonly sought after species include moose, caribou, bear, grouse and ptarmigan, ducks, beaver, fox, wolf, marten, lynx, muskrat, and mink. Migratory birds, waterfowl, and raptors are found throughout the lakes and river, providing visitors with opportunities for viewing and photography. Primary subsistence uses of the area include moose and caribou hunting, spearing whitefish, and gathering berries.

The Delta River and Tangle Lakes provide opportunities for both motorized and nonmotorized boating. Motorized boating occurs primarily on the lakes adjacent to the developed facilities, and to a lesser extent

on the lower river between Phelan and Garrett Creeks. Nonmotorized boating occurs throughout the entire system, as most lakes and the river can be traveled in a relatively short amount of time (2-3 days). There are essentially three different boating options available on the Delta River:

1. Upper Tangle Lakes:

   Boat launch facilities at the DWSR wayside provide access to the Upper Tangle Lakes system. Motorized boaters are primarily confined to the first lake of the Upper Tangles, unless they carry their boat and motor across the first portage to the second lake. Occasionally, motorized boats travel up the shallow Tangle River to Mud Lake. Nonmotorized craft typically travel through the first lake, then portage to the second lake. At the southern end of the second lake, another portage provides access to a third lake (Mud Lake). From here boaters generally travel northwest into the Tangle River or south to Dickey Lake.

2. Delta River:

   Boat launch facilities at the Tangle Lakes Campground provide access to the Lower Tangle Lakes and Delta River. Round Tangle Lake, adjacent to campground and boat launch, is primarily used for day use activities, by motorized and nonmotorized boaters. Those wishing to access the upper Delta River can continue north through the Lower Tangle Lakes. The first nine miles of this trip cross through three of the Lower Tangle Lakes, which are all connected by shallow channels of slow moving water. Motorized boats generally do not proceed beyond the shallow constriction of Long Tangle Lake. Eventually, the river begins to flow north out of Lower Tangle Lake, carving its way through the Amphitheater Mountains and the foothills of the Alaska Range. It is 20 miles from the outlet of Lower Tangle Lake to the takeout point located at Mile 212.5 on the Richardson Highway.

   The first few river miles are shallow and rocky, Class I-II water. Following this first section, there is a portage around a series of waterfalls on the east side of the river. The river portage is marked with yellow caution signs on both sides of the river. Below the falls and portage, the river narrows and the velocity increases significantly for the next two miles of Class II rapids. The next 12 river miles are slow, meandering, Class I water. At the confluence of Eureka Creek, the river changes from clear water to silty glacial water. The last 7 river miles are often shallow and braided, with numerous channels and gravel bars. The water is swift and generally Class II. Motorized boats use this section of the river, and generally travel between Phalen and Garrett Creeks. Almost all floaters take out just below Phelan Creek at Mile 212.5 on the Richardson Highway. The exact takeout location varies from year-to-year due to changes in the river channel. Parking is available adjacent to the river, and the takeout is marked with a large yellow caution sign. The vehicle shuttle from the Tangle Lakes Campground launch point to the river takeout is 49 miles on the Richardson and Denali Highways.

3. Lower Delta River:

   The Richardson Highway parallels the Delta River from Phelan Creek to the northern river corridor boundary, which terminates just downstream of Black Rapids Glacier near the confluence of One Mile Creek. Experienced boaters sometimes continue approximately 18 river miles downstream, past the Black Rapids Glacier. The river becomes very swift with typical glacial river characteristics and is rated Class III-IV. There are no designated takeout points for this portion of the DWSR, but the Richardson Highway parallels the river in numerous locations.

3.2.6.3 Visitor Characteristics

The following data regarding visitor characteristics and preferences was developed from the 2005 Delta River Recreation User Survey (Whittaker and Shelby, 2005):

- **Group Size:** Average group size was 4 for Delta River “through trip” groups and 3 for Upper Tangles groups, motorized boating groups, and OHV groups.

- **Season of Use:** Lake users reported taking most trips during June, July and August; Delta "through trip" users primarily in July, and lower Delta River motorized boaters and OHV users in August and September. This data is consistent with overflight use data conducted by BLM.
- **Residency:** 97 % of reported Delta River users were Alaska residents.
- **Trip Length:** The median trip length for lake and "through trip" river users was 3 days. The median trip length for lower Delta River motorized boaters was 6 days, while Top of the World OHV users reported a median trip length of 2.5 days.

Users were also asked to identify the most important activities they engaged in while on their trips. The top rated reasons for nonmotorized users were oriented towards "non-consumptive" backcountry recreation in primitive settings (areas providing naturalness and solitude). In contrast, motorized users rated fishing and hunting ("consumptive recreation") much higher. Both groups rated "being with friends and family" very important, but the least important attribute among both groups was "meeting other river users," which suggests that while friend and family groups are acceptable, minimizing interaction and competition between other user groups is desired.

Users were asked to compare different type of experiences that are available on various segments of the river with the type of experience that they think should be provided, using the following experience descriptions:

- **Primitive Setting:** Where one expects to find solitude, very few traces of previous use, no motorized use or OHV trails, and no development.
- **Primitive Motorized Setting:** Similar to primitive setting, but motorized use may occur and OHV trails may occasionally be visible.
- **Semiprimitive Setting:** Where one expects to meet few other groups, but solitude is still possible, particularly at camps. There is little or no motorized use or OHV trails, occasional evidence of previous use, and a few developments such as trails or outhouses.
- **Semiprimitive Motorized Setting:** Similar to a semiprimitive setting, but motorized use may occur and OHV trails may occasionally be visible.
- **Undeveloped Recreation Setting:** Where one expects to meet other groups and solitude is difficult to find. There is motorized use; OHV trails are visible at several locations, evidence of previous use at many sites, and developments such as trails and outhouses.

Results for all users surveyed are shown in Table 5. The river corridor was divided into four different segments, each representative of river settings that are present in the DWSR corridor. **Bolded** entries indicate segments where reported experiences have higher use and development than preferred experiences (indicating a potential overuse situation):

Table 5: Available and preferred types of "experience settings" for different river segments

Non-motorized users		
Segment	Available setting (majority response)	Preferred setting (majority response)
Upper Tangle Lakes	**Semiprimitive**	**Primitive**
Lower Tangle Lakes	**Primitive Motorized**	**Primitive**
Upper Delta River	Primitive	Primitive
Lower Delta River	Primitive	Primitive
Motorized users		
Segment	Available setting (majority response)	Preferred setting (majority response)
Upper Tangle Lakes	Semiprimitive Motorized	Semiprimitive Motorized
Lower Tangle Lakes	Primitive Motorized	Primitive Motorized
Upper Delta River	**Primitive Motorized**	**Primitive**
Lower Delta River	**Semiprimitive Motorized**	**Primitive Motorized**

Major findings from this data include:

- Users generally recognize there are different opportunities provided on various segments, and that these differences are desirable.

- In general, there appears to be a continuum of opportunities from the primitive, nonmotorized end of the spectrum to the semiprimitive, motorized end.
- In general, differences between reported and preferred experiences are greater for nonmotorized users, indicating they are more sensitive to higher use densities, development, or motorized use.
- Motorized users recognized that the Upper Delta River offers nonmotorized opportunities at present, but slightly fewer prefer that situation.
- Motorized users prefer slightly more primitive settings than they reported, but they do not generally support nonmotorized versions of more primitive settings.
- The data indicates that at current use levels, users' abilities to experience a primitive or semiprimitive river trip on certain segments are being impacted.

3.2.6.4 Visitor Use Trends

BLM utilizes different methods to estimate visitor use levels on the Delta River. Sources include voluntary visitor registration kiosks, post use reports required from commercial permittees, airplane flights over the river corridor on random days; traffic counters at campgrounds and wayside facilities; supplemented by visual observations and river user surveys. Annually, BLM submits the number of "visits" at each recreational site, trail, facility, etc. in the Recreation Information Management System (RMIS) visitor use system.

Table 6 depicts reported annual RMIS visitor use numbers for the DWSR corridor. These numbers are the best estimates available; accurate visitor use data is difficult to obtain in remote, relatively low use areas with low compliance registration data. Each number represents total "visits" to the particular area or site, and each "visit" represents one primary activity by one person (boating, fishing, OHV use, berry picking, hiking, etc.) within the river area:

Table 6: Historical Visitor Use Data: Reported Number of Annual Visits

Year	Delta River	Upper Tangles Lake Use	Lower Tangles Lake Use	Tangle Lakes Campground	DNWSR Wayside
1970	100				
1972	300				
1975	457				
1976	396				
1977	450				
1978	500				
1979	449				
1980	634				
1981	240				
1982-85	no data				
1986	600				
1987	1620			15876	13392
1988	1068			12480	17755
1989	260			13213	11248
1990	858			15150	12479
1991	863			15150	12479
1992	768			18114	14008
1993	658			21000	10800
1994-96	no data			no data	no data
1997	830	2168	2343	16000	15300
1998	645	2130	2785	14834	14468
1999	737	1865	3493	17070	10989
2000	525	2349	3013	15486	9890
2001	738	2356	3592	9882	7457
2002	717	1657	2759	11761	6349
2003	706	1723	2465	11480	9350
2004	537	1764	2516	12560	9054
2005	763	1530	3128	14543	5638
2006	633	2150	2782	16427	7557
2007	659	1849	3033	15737	7440
2008	603	1677	2267	14969	7245
2009	559	1482	3223	16244	7958

BLM believes that the original methods used to determine visitor use resulted in overestimations in earlier years. As methods used to calculate visitor have been refined, use numbers have decreased accordingly. Use estimates for the Delta River were very high during the years 1987-88, and from 1970-97, visitor use was not split between river segments; consequently the total visits for the Upper Tangles and Lower Tangle Lakes are unknown. However, the visitor use trends do demonstrate relatively stable use patterns, with cyclical fluctuations in visitor use (most likely associated with gas prices, weather, economy, etc).

The number of boaters and OHV users has increased statewide as watercraft and OHVs are more available and affordable today than in the past. As statewide populations increase in the future, visitor use within the river corridor may increase, and more specifically, boating and OHV activities on some river segments may increase. Annual fluctuations in visitor use are often dependent on weather, gas prices, and other factors. While motorized boating and OHV use is considerably less than on the Gulkana River, it has been slowly increasing due to a change in Federal Subsistence hunting regulations that allow residents of Delta Junction to participate in the Federal Subsistence hunt. Feature stories in local publications and the internet have also drawn attention to the area.

Overflight information helps to characterize visitor use throughout the river corridor at different times of the year. The use season remains relatively constant every summer, as the ice on the lakes does not recede until early June and most all documented river use ends by late September, with the close of subsistence caribou season on September 30.

Specific observations related to overflight data include:

- Visitor use is generally higher on the Lower Tangles and upper Delta River in July and August; and higher on the lower Delta River and Upper Tangles in August and early September.
- Nonmotorized boats account for more than 65% of boats on lake segments; 80% or more on the river upstream of Eureka Creek; but only 29% on the lower river below Eureka Creek.
- On the lake segments, 19 to 35% of the days had no boating use, and on the main river segments this was true for 45 to 65% of the days (97% on Black Rapids segment).
- Highest use levels are on the lake segments (particularly Round Tangle Lake), with boats observed on 65% to 80% of the days when overflights occurred. In contrast, use was observed on 35% to 54% of the days on the main river segments (and only 3% on the Black Rapids segment). This is consistent with the number of respondents reporting lake vs. river use in the Delta River User Survey, as well as with RMIS use estimates.
- On the lakes, the average is 3-4 nonmotorized craft and 1-2 motorized boats per flight. On the river segments, the average is 2-5 nonmotorized boats and 1-3 motorized boats per flight. These use estimates are roughly consistent with encounter data in the river user survey, which suggested encounter rates of 2-6 groups per day.
- Nonmotorized use levels are higher in July on most segments except for the upper Delta, which is higher in August. Motorized use on the Upper Tangles and lower Delta River is higher in August and September (coinciding with the hunting season). On Round Tangle Lake, Lower Tangle Lake, and the upper Delta River, motorized use is higher in July.
- Of the 560 boats observed on overflights from 2000 to 2004, 422 or 75% were nonmotorized, and 138 or 25% were motorized.
- OHV use was observed on 6 out of 37 flights (16% of days), and the number of OHVs rarely exceeded 2 per observation. Nearly all of the observed OHVs were near the lower river (Top of the World Trail); and OHVs were never observed during June or July.

3.2.6.5 Recreation Management Concerns

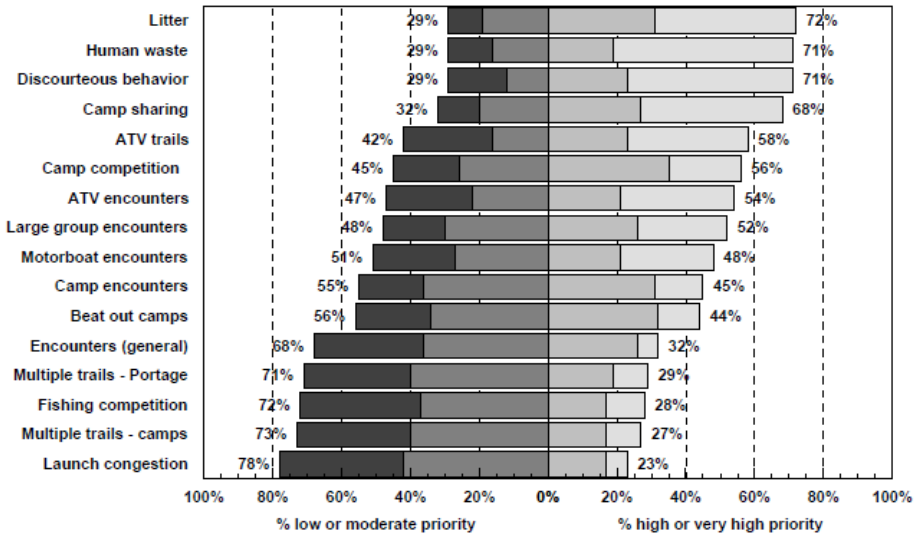
The 1983 DWSR Management Plan recognized the need to determine the amount and type of use that the DWSR corridor could perpetually sustain without impairing its scenic and primitive character, or causing unacceptable change to the experience of the user. The 1983 DWSR Management Plan also discusses the need for determining a “carrying capacity” for the river. Carrying capacity has been defined as the level of use beyond which impacts exceed acceptable levels specified by standards (Shelby & Heberlein, 1986). The actions identified in Chapter 2 of this EA incorporate an adaptive management approach to address visitor use issues and carrying capacity. The alternatives identify standards for

different impacts on the river and associated management actions if standards are exceeded. The following section discusses these impacts that are associated with recreational use.

In Figure 1, the 2005 Delta River User Survey rated visitor use impacts within the river corridor and their level of priority to river users. These results portray the following:

- Litter and human waste were rated among the highest priorities.
- Camp competition, camp sharing, and camp encounters (camping within sight or sound) were relatively higher priorities than "beat out" camps. This may suggest that users are more concerned about getting a camp to themselves, rather than the actual conditions at camps.

Figure 1: 2005 Delta River User Survey: Respondents' priorities among different impacts



3.2.6.5.1 Group Sizes

Regardless of the fluctuation in estimated visitor use figures since 1983, there is evidence of an increase in both state population and out-of-state visitation over the past two decades. Most importantly, some of the data shows that on some segments of the river, current use levels are causing unacceptable change to the experience of the user and impacting the natural and primitive character of the river (refer to Figure 2). Large groups can impact the recreational experiences of smaller groups, and campsites cannot always sustain larger groups, causing resource damages including expansion of bare ground, vegetation trampling, creation of social trails and satellite sites, and congestion at the river portages. Data from the 2005 Delta River User Survey summarizes the following:

Figure 2: Statistics regarding largest reported and tolerable group sizes

Segment	Mean	Median	Typical range[1]	% "don't care"	Percentage reporting...	
					≤12	≤20
Reported largest group sizes	7.8	5	4 to 9	--	82	96
Largest tolerable group sizes	8.1	7	4 to 10	16%	86	98

3.2.6.5.2 Litter

Most concentrations of litter occur in the firerings at dispersed campsites, but can be found scattered at any point along the river, especially at heavily used camping areas. The BLM river crew floats the entire system three to four times per year, and each trip usually results in 2-3 garbage bags of litter. There are garbage receptacles located in all of the developed facilities and boat launches, and interpretive

information is provided that includes Leave No Trace minimum impact camping information. Monitoring information compiled from river patrols from 2006-2009 show that litter was present at approximately 135 campsites of 562 campsites monitored during this time period. This equates to an average of approximately 24% of campsites having litter from 2006-2009.

3.2.6.5.3 Human Waste

Current overnight use estimates for the Delta River float trip estimate annual use at approximately 500 people per year. With trip lengths averaging about three days, and people producing approximately 0.5 pounds of solid waste per day (*Better Boater Bathrooms: A Sourcebook for River Managers)*, about 750 pounds of waste is estimated to be deposited along the river each year. While methods of disposal vary (including the use of outhouses, catholes, and some portable toilet systems), much of this waste remains visible to other users. BLM river crews clean up the most obvious areas that contain human waste. Outhouses along the river can help address some of these problems if users know about and use them. Outhouses also pose a logistical and maintenance challenge on the Delta River. Given the high water table and occurrence of permafrost in the area, outhouses are very hard to install. Once installed, they also require regular maintenance (cleaning and relocation when the pit is full). Currently there is one outhouse located at the Delta River portage. There are also vault toilets at the Tangle Lakes Campground and the Delta Wayside.

River users have indicated a strong intolerance for human waste. According to the 2005 Delta River survey, this is an issue where the current level of impact exceeds the level of tolerance. Monitoring information compiled from river patrols from 2006-2009 show that human waste was present at approximately 82 campsites of 562 campsites monitored during this time period. This equates to an average of approximately 15% of campsites having human waste present from 2006-2009.

3.2.6.5.4 Fire Rings

River patrols by BLM have documented multiple fire rings at some existing campsites. River crews dismantle all but one fire ring per site, but many times these are reconstructed in different places within the campsite. Multiple fire rings at campsites increase the amount of charcoal and unburned waste, and affect the appearance and cleanliness of the sites. The unburned waste may be swept into the river during high flow events, resulting in litter accumulation in the water column. Rocks and soils are permanently scarred, and sites with multiple fire rings are difficult to rehabilitate. Monitoring information compiled from river patrols from 2006-2009 show that multiple fire rings were present at approximately 26 campsites of 562 campsites monitored during this time period. This equates to an average of approximately 5% of campsites having multiple fire rings from 2006-2009.

3.2.6.5.5 Chainsaw Use

The use of chainsaws to cut standing trees and woody debris for firewood has become an issue within the river corridor. The use of chainsaws on the lower river is increasing, and as a result, more standing trees and large woody debris from the riverbed and campsites are being cut for firewood. The use of chainsaws also creates noise disturbances within the river corridor, detracting from a quiet, primitive experience. Restrictions on the use of chainsaws to cut firewood can reduce the volume of wood used for firewood and can result in increased woody debris in the river and bank stabilization which is important for fish habitat.

3.2.6.5.6 Recreational Shooting

The recreational discharge of weapons (i.e. target shooting or “plinking”) within the river corridor presents a safety concern to the public. In addition to the campgrounds and launch facilities where users congregate, there are numerous users along the river fishing, camping, and boating.

3.2.6.5.7 Campsite Impacts

Campsites along the river are dispersed sites and have formed over the years as use on the river has increased. There are currently 66 inventoried campsites within the river corridor. There are 27 campsites on the Upper Tangles, 19 campsites on the Lower Tangles, and 20 campsites on the upper and lower

Delta River. Impacts at campsites include vegetation trampling and removal; soil compaction and bare ground; fire rings; trees cut for firewood, tent poles, and meat racks; and social trails leading to satellite campsites. Of 66 campsites within the entire river corridor, about 10 are considered heavily impacted (greater than 66% bare ground disturbance). These occur at popular areas such as the outlet of Long Tangle Lake, on the lower river in the vicinity of Garrett Creek, and along the Top of the World OHV trail. Aside from the physical impacts to river resources, impacted camps can also affect a users' ability to have primitive experiences on the river.

3.2.6.5.8 Campsite Encounters

"Encounters", the number of contacts with other *groups* per day, has been a focus of backcountry recreation researchers for 30 years. The consistent finding has been that backcountry users prefer contact with less than about 4 to 5 other parties per day in order to have high quality "wilderness," "primitive," or "backcountry" experiences (Vaske et al., 1986). Recreationists have more tolerance for encounters during the day than at night when they are camping.

Several studies, including the 2005 Delta River User Survey, suggest that camping related encounters have greater effects on user perceptions of crowding than river encounters. Accordingly, campsite encounters can be used as a primary crowding-related indicator (Whittaker, 1989). In relation to the number of campsites within each river segment, survey data shows that users are willing pass up campsites approximately 20% of the time before it begins to negatively affect their recreational experience. Users on the Delta River were asked to report encounter levels for various segments, as well as their preferences and tolerances for encounter levels. Figure 3 summarizes statistics for each river segment:

Figure 3: Reported, preferred, and tolerable group encounters per day by river segment

Segment	Mean	Median	Typical range[1]
Reported encounters			
Upper Tangles	5.0	3.0	2 to 5
Lower Tangles	6.1	3.0	2 to 8
Upper Delta	2.7	1.0	0 to 3
Lower Delta	2.9	1.0	0 to 3
Preferred encounters			
Upper Tangles	3.3	2.0	0 to 4
Lower Tangles	3.8	2.0	0 to 4
Upper Delta	2.9	1.0	0 to 3
Lower Delta	2.9	1.0	0 to 3
Tolerable encounters			
Upper Tangles	10.0	6.0	4 to 10
Lower Tangles	10.7	6.0	4 to 10
Upper Delta	6.3	4.0	2 to 10
Lower Delta	5.6	3.5	2 to 6

Survey data from the 2005 Delta River User Survey shows impact levels for camp encounters at or approaching preferred levels on certain segments of the river. More specifically:

- For the lake segments, reported encounters were higher than preferred encounters. For the river segments, reported encounters were nearly equal to preferred encounters, indicating that encounters on the river segments are approaching a point that is not desirable.
- For all segments, reported encounters were significantly lower than tolerances.

3.2.6.5.9 Commercial Activities

Commercial use levels within the river corridor are very low compared to private use. BLM currently authorizes one commercial outfitter within the river corridor under a Special Recreation Permit (SRP), and has developed mitigation measures to protect river resources from impacts caused by activities associated with commercial groups. Typically, commercial groups have larger group sizes than private groups, and SRP regulations allow the BLM to limit group sizes, trip durations, and activities of commercial groups. In the 2005 Delta River User Survey, there was support (66%) among nonmotorized users for limiting commercial use, and there was more support than opposition among motorized users.

3.2.6.5.10 Facility Development

In 2006, the DWSR Wayside was reconstructed to accommodate increased day use from Denali Highway travelers passing through the river corridor. These renovations included the development of new parking facilities, interpretive walkways and information panels, and reconstruction of the existing boat launch. In 2010, a renovation of the Tangle Lakes Campground is planned. Designated campsites, roadways, and parking facilities will be developed and interpretive panels will be installed throughout the campground.

Survey results indicate that most river users do not support substantial portage area improvements such as outhouses, trail signs, bridges, etc., although there was majority support for improving the main portage trail with native materials and for rehabilitating spur trails. River users were opposed to removing the portage warning signs and the outhouse. Most participants in the BBM meetings supported a redesign of the Tangle Lakes Campground that preserves the rustic nature of the natural surroundings, and that it should not be overdeveloped like many other campgrounds in the state.

3.2.6.6 Recreation Opportunity Spectrum (ROS)

In preparation for the EARMP land use planning effort in 2003, the Glennallen Field Office conducted an inventory of existing recreational opportunities available across the district using the Recreation Opportunity Spectrum (ROS) classification system. The ROS is a framework for classifying and defining different types of outdoor recreation environments, activities, and experience opportunities, as described in Table 7. The inventory conducted classified recreational opportunities that currently exist on BLM managed lands. An increase in accessibility and a growing trend in visitation and recreation activities in areas that were previously remote and inaccessible can lead to more developed ROS classes. ROS classifications help define existing types of recreational opportunities, and management actions can be developed that can be used to maintain or change ROS classifications.

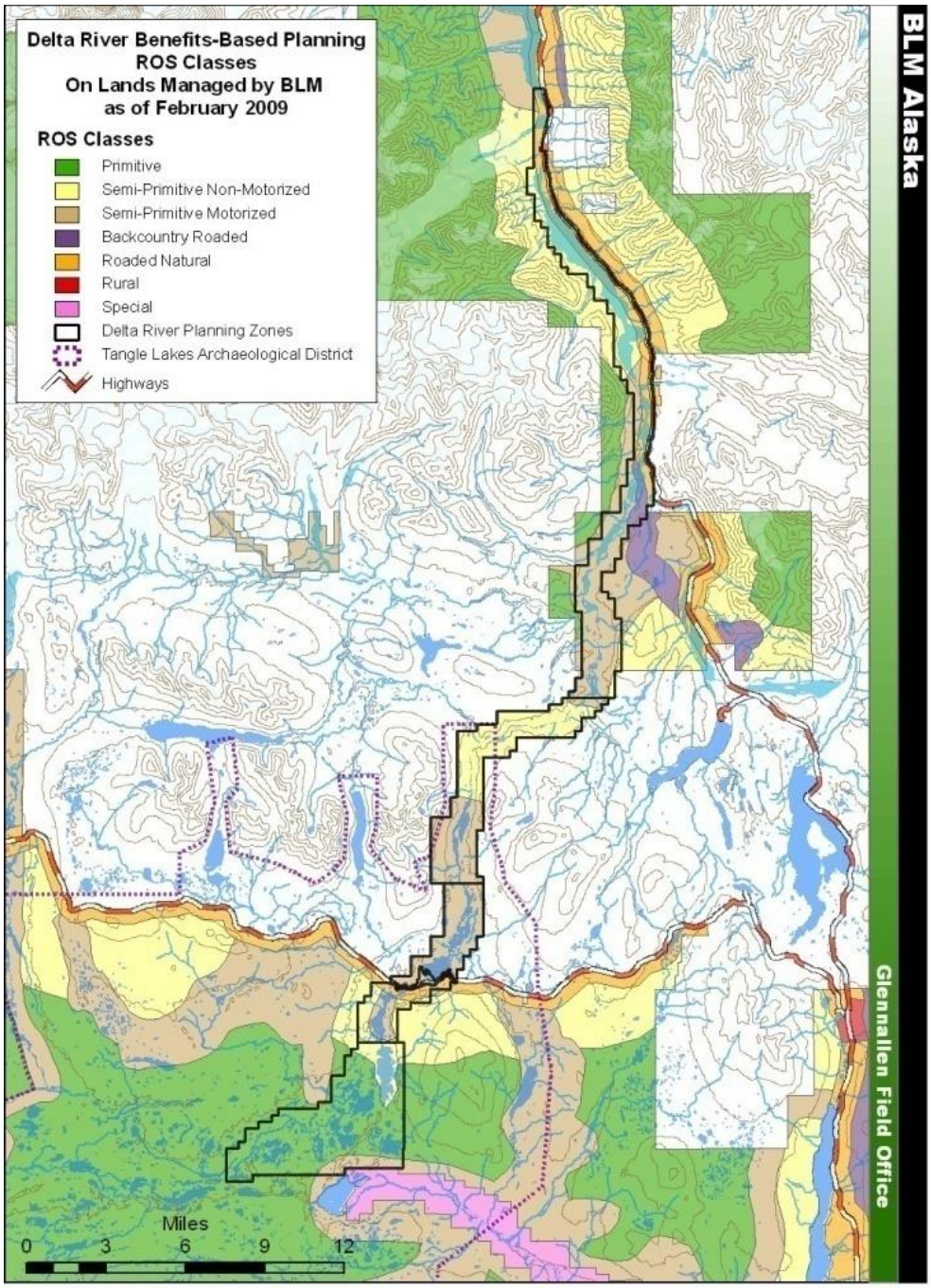
The EARMP designated the DWSR corridor as a SRMA, with objectives to maintain the existing recreation opportunity spectrum classes that were identified during the ROS inventory that was conducted in 2003. These ROS classes included the primitive, semiprimitive nonmotorized, semiprimitive motorized, and roaded natural ROS classes within the river corridor, with an emphasis on managing for a primitive experience in the portion of the DWSR corridor classified as “wild”. ROS classes that were identified during this inventory are depicted in Map 9.

Table 7: Selected Recreation Opportunity Spectrum (ROS) Class Descriptions

ROS Class	Description
Primitive	Area is characterized by essentially unmodified natural environment of fairly large size. Concentration of users is very low and evidence of other users is minimal. No summer motorized trails exist although seasonal motorized use occurs at a low density. Sights and sounds of the road system are nonexistent and area is remote. Human built structures are few and far between or are inconspicuous. Vegetation and soils remain in a natural state.
Semiprimitive Nonmotorized	Area is characterized by a predominantly unmodified natural environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. The area is more accessible than an area in a primitive class, but is free of motorized trails and roads. Sights and sounds of the road system are more prevalent than in the primitive class, but less prevalent than in the roaded natural or backcountry roaded classes. Vegetation and soils are predominantly natural but some impacts exist.

Semiprimitive Motorized	Area is characterized by a predominantly unmodified natural environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. Area is accessible to specialized OHVs but is generally not accessible to most four wheel drive vehicles. Sights and sounds of the road system may or may not be dominant. Some portions of the area may be distant from road systems, but all portions are near motorized trails. Vegetation and soils are predominantly natural but localized areas of disturbance may exist.
Roaded Natural	Area is characterized by a generally natural environment with moderate evidence of the sights and sounds of humans. Resource modification and utilization practices are evident, but harmonize with the environment. Concentration of users is low to moderate, and rustic facilities may exist for user convenience and safety. The area is accessible to conventional motorized vehicles and roads are maintained on a regular basis. Sights and sounds of the road system are evident and traffic levels may be highly variable. Areas of localized vegetation and soil impacts exist. User concentrations are low to moderate but may be high in popular recreational sites such as waysides, trailheads, and water access points.

Map 9: Recreation Opportunity Spectrum (ROS) Classes within the Delta River Corridor



3.2.6.7 Benefits Based Management (BBM) in the EARMP

Note: For a more complete overview on the BBM planning process, including required land use allocation decisions, management actions, and processes, refer to Appendix 7.2.

The EARMP designated the DWSR corridor as a SRMA. During the preparation of the EARMP, new BBM planning process guidelines were still in development. As a result, only some of the required land use planning allocation decisions that were specified in the new BBM guidelines were implemented. BLM identified four RMZs and developed a market strategy for the entire SRMA, but did not identify the prescribed setting character and activity planning framework. Appendix 7.2 displays the BBM decisions that were made in the EARMP for the Delta River SRMA.

After completion of the EARMP, the new planning process requirements for BBM were established in the BLM Land Use Planning Handbook, H-1601-1. As a part of this planning process, recreation planners determined that the four existing RMZs were not entirely representative of the current recreational opportunities that are available. For this planning process, focus group meetings helped determine the need for changes to existing RMZ boundaries; primary activities, experiences, and benefits for each RMZ; prescriptions that would promote the desired activities, experiences and benefits; and management actions that form the basis for the activity planning framework. As part of developing the new Delta River SRMA plan, the EARMP must be amended to make the recreation allocation (i.e., land use planning) decisions that were not made in the EARMP, and to make changes to the RMZs and management objectives that were specified in the EARMP.

3.2.7 Scenic Resources

The 1983 DWSR Management Plan describes scenic resources that are found within the DWSR corridor: “The quality of scenery in the Tangle Lakes and Delta River area can be surmised from the previous description of topography. Photographic opportunities are nearly limitless with snow, water, rock, and vegetation interspersed over rolling hills, mountains, and valleys in a manner which provides viewing pleasure equal to the best Alaska has to offer.” Scenic qualities were recognized as exemplary in 1983, and a quarter century later, still remain one of the most important resource values in the river corridor. Scenic quality is an essential component of most recreation activities.

In 2003, a visual resources inventory of the DWSR corridor and adjacent lands was conducted. Through spatial analysis of overflight information using GIS software, on-the-ground observations, scenic quality ratings, distance classes, viewshed analysis, sensitivity classes, and specialist input, VRM inventory and management classes were developed. The entire DWSR corridor was specified as a Class I Visual Resource Management (VRM) viewshed, with the primary objective of retaining the existing character of the landscape. Class I VRM objectives state that “The level of change to the characteristic landscape should be low, and management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color and texture that are found in the predominant natural features of the characteristic landscape”.

3.2.7.1 Scenic Resources Concerns Related to Recreational Activities

The major disturbances to the viewshed in the DWSR include recreational facilities, dispersed campsites and trails. Facilities developed within the DWSR corridor since 1983 have been targeted at decreasing impacts such as visible human waste (outhouse), vegetation trampling or soil compaction (portage construction), human safety (warning signs at portage and takeout), and increased Denali Highway visitor use (DWSR wayside reconstruction). New facilities conform to Class I VRM standards to minimize visual impacts within the river corridor.

Approximately 10 dispersed river campsites have are heavily impacted and evident to the casual observer. Visual impacts come from bare ground and river access points that are out of place with the natural vegetation cover present along most of the river. Trails leading from the riverbank to campsites can become eroded, further impacting scenic resources.

OHV trails that are visible from the river corridor include the Top of the World Trail and two unauthorized OHV trails in the Eureka creek drainage. Unauthorized spur trails have also been created by users to reach the ridge tops from the developed facilities in the vicinity of the Tangle Lakes Campground and DWSR wayside. The proliferation of unauthorized trails can lead to unsustainable trail systems that can change the visual characteristics of the landscape. In some areas, because of wet and muddy conditions, trail braiding has reached a width of 100-300 feet.

3.2.8 Soil Resources

In the Tangle Lakes area, the DWSR corridor consists of glaciated intermountain basins dominated by porous, gravelly, glacial outwash deposits. Landforms include hills, pitted outwash plains, kettle lakes, and sinuous eskers. Surface drainage patterns are not well established, and only a few of the lakes within the area are connected by streams. Soils immediately adjacent to the Tangle Lakes, Tangle River, and upper Delta River generally consist of a thin mantle of loess over glacial outwash or till and organic materials. Along the clear water section of the river, the banks are considered stable with highly developed riparian vegetation capable of withstanding extreme winter ice events and spring and summer high water events. Once the river becomes glacial, the banks become highly susceptible to erosion due to higher river velocities, high sediment loads, gravelly bank materials, and unstable riparian vegetation.

3.2.8.1 Soil Resources Concerns Related to Recreational Activities

The primary concern related to soil properties and OHV use is the development of unauthorized OHV trails. Unauthorized OHV trails are not maintained by BLM, and can result in additional trail proliferation and river crossings, potentially impacting soil resources through vegetation loss, soil compaction, soil erosion, and bank instability. Currently, there are four unauthorized OHV trails within the DWSR corridor. Continued use of unauthorized trails will lead to further braiding and erosion, and may contribute to increased sediment in the river. Designated OHV trails within the river corridor (Top of the World and Rainy Creek Trails) are less of a concern because they receive trail maintenance to prevent negative impacts to soil properties.

Concentrated visitor use on the river has increased the potential for vegetation trampling, soil compaction, and soil erosion, especially immediately adjacent to the river. BLM monitors bare ground at campsites along the river. So far, trampling impacts are limited to vegetation loss and soil compaction within the campsites. Little riverbank erosion is occurring, although the potential for increased riverbank erosion is possible, especially with increased visitor use.

3.2.9 Subsistence

The DWSR corridor is a federal subsistence hunting area and provides exceptional opportunities for caribou and moose harvest. Access to subsistence hunting opportunities is primarily through boating on the river and by using both motorized and nonmotorized trails described in the *Travel Management* section. Other subsistence activities that take place within the river corridor include firewood gathering, berry picking, and trapping.

3.2.9.1 Federal Subsistence Management History

ANILCA provides the basis for federal management of subsistence uses on federal public lands in Alaska under Title VIII. Title VIII §811 states that “rural residents engaged in subsistence uses shall have reasonable access to subsistence resources on the public lands” and permits “appropriate use for subsistence purposes” of “snowmobiles, motorboats, and other means of surface transportation traditionally employed for such purposes by local residents, subject to reasonable regulation.” Subsistence management regulations for the harvest of fish and wildlife on federal public lands are codified in 50 CFR Part 100.

The 1992 Record of Decision on Subsistence Management for Federal Public Lands in Alaska formally established the federal subsistence management program in Alaska under the US Fish and Wildlife Service, Office of Subsistence Management (OSM). The BLM Glennallen Field Office (GFO) was delegated authority to manage and issue federal subsistence hunting permits within its jurisdiction. GFO

administers subsistence permits to federally-qualified rural residents for Game Management Unit (GMU) 13. GMU 13 is further subdivided into four subunits. The DWSR is located in GMU 13B. Since 1992, an average of 59% of the federally harvested moose (Fig. 4) and 97% of federally harvested caribou (Fig. 5) in GMU 13 came out of GMU 13B. In 2008, GFO issued 1124 moose permits and 2536 caribou permits, which constituted 75% of all federal subsistence permits issued in Alaska (OSM, 2009).

Figure 4: Reported harvests for federal moose hunts RM 313 and RM 314 from 1992 to 2009.

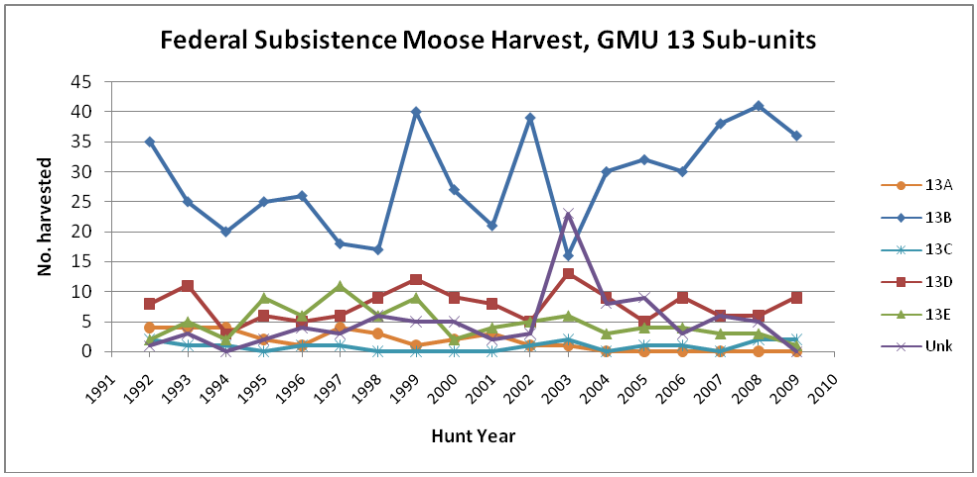
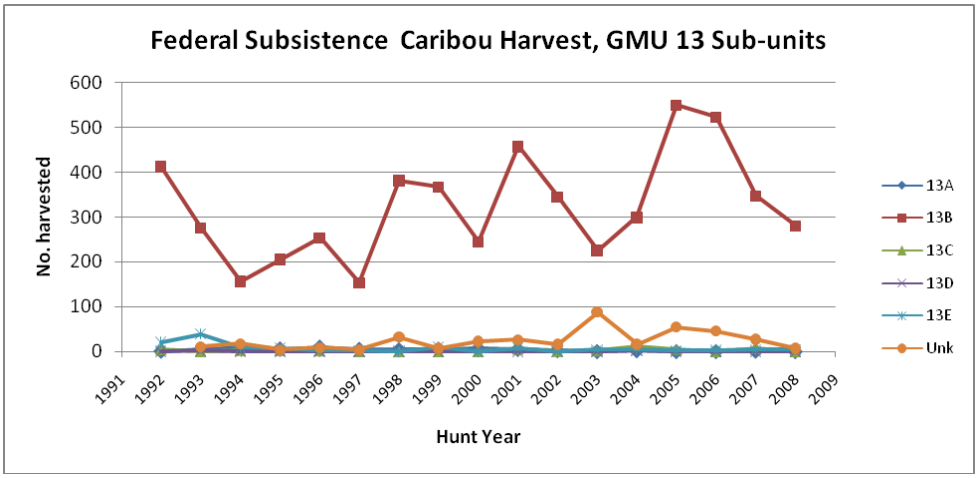


Figure 5: Reported harvests for federal caribou hunts RC513 and RC514 from 1992 to 2008.



3.2.9.2 Subsistence Management Concerns Related to Recreational Activities

Subsistence management concerns related to recreational activities generally involve OHV use and the loss of animal refugia. As technology improves and OHV users are able to reach areas that were previously inaccessible, the number of unauthorized trails may increase. Although the immediate benefit of this type of activity is easy access to the river corridor, the long term effects to subsistence resources may include increased habitat fragmentation, loss of animal refugia and degraded trail conditions.

3.2.10 Travel Management

Travel Management is a comprehensive program that addresses all types of access and transportation activities within the DWSR corridor including motorized, nonmotorized, mechanized, and animal powered modes of transportation.

3.2.10.1 History

Prior to the discovery of gold in the Valdez Creek area, access to the DWSR corridor was historically driven by subsistence activities. Trails within the river corridor provided a route for the Ahtna people to access seasonal hunting opportunities. After the discovery of gold in the Valdez Creek area, these same trails provided overland access to miners coming from Valdez. The trail to the Maclaren River and Valdez Creek mining areas would eventually become the Denali Highway, completed in 1957. After completion of the Parks Highway in 1972, use levels on the Denali Highway dropped significantly.

The advent of the four wheeled OHV in the early 1990's changed access to the Alaska backcountry. OHVs soon replaced larger vehicles as the primary means of access to hunting, fishing, or recreational destinations throughout Alaska. In the TLAD, the designation of trails and the prohibition of cross-country OHV travel to protect archeological resources were instituted in the early 1980s.

3.2.10.2 Motorized Trails Description

3.2.10.2.1 Rainy Creek Trail

The Rainy Creek Trail was developed in 1971 to access Federal and State mining claims on Rainy Creek, and is primarily used during the winter months by miners to haul supplies for use during the summer mining season. There has been limited use of this trail for recreational OHV or subsistence purposes, due to the difficulty of crossing the fast moving river with OHVs, which would require using a boat to ferry OHVs and equipment across the river. The Rainy Creek Trail is approximately 10 feet wide and is set back from the river, running through upland spruce vegetation and cover, making it very difficult to see from the river. The Rainy Creek trail is regularly maintained by owners of mining claims on Rainy and Eureka Creeks.

The 25 mile trail begins on the west side of the Delta River across from the Phelan Creek pipeline access bridge, which is located at Mile 211 on the Richardson Highway. Miners generally park on the gravel bar, transporting supplies across the river, over the ice, using large sleds pulled by heavy equipment. The trail and runs south along the river for approximately four miles, before turning west along the south side of Rainy Creek. After turning west up Rainy Creek, the trail continues along the West Fork of Rainy Creek, over the pass to the Eureka Creek drainage, and into Broxson Gulch. This portion of the trail was constructed in 1994 to avoid having to use the Top of the World/Yost Trail, which was the historic mining access route to Eureka Creek. The Rainy Creek Trail extension was made to avoid resource damage at the Top of the World/Yost Trail river crossing.

3.2.10.2.2 Top of the World/Yost Trail

The historic Yost Trail was an east-west trending trail connecting the Richardson Highway with the Eureka Creek Mining District, ending near the confluence of Specimen Creek and Eureka Creek. BLM now calls it the Top of the World Trail. Historically, this trail was used to move mining equipment and to access mining claims, and may date to the early 1900's. In 1994, BLM authorized the construction of an alternate route to the Eureka Creek drainage, which is now an extension of the Rainy Creek Trail. After the extension of the Rainy Creek Trail, the old Yost Trail receives only occasional use by hunting parties, primarily during subsistence hunting season.

The Top of the World Trail is the most commonly used OHV trail in the DWSR corridor. This trail begins at Mile 205 of the Richardson Highway. The trail heads west, crosses Phelan Creek over a pipeline access bridge, and follows the TAPS pipeline for approximately 2 miles. The next 1.5 miles has numerous boggy and degraded sections of trail where OHV use has created significant trail braiding and large "muckholes". After wet weather, many of these "muckholes" can be challenging to cross, and a defined main trail can be difficult to follow. At mile 3.5, the trail descends into the river corridor down a steep drainage, with numerous ruts, braids, and "muckholes" that have developed due to poor trail construction. Eventually, the trail meets the Delta River, where it abruptly turns south and improves dramatically in quality, running parallel with the river for approximately three miles, terminating at the river's edge. This portion of the trail is in generally good shape with well drained soils. At approximately 8 miles, the trail fords the Delta River.

The river crossing is difficult, and requires crossing three separate river braids, ending at a deep pond created by a beaver dam. After the beaver pond, the trail heads southwest for 0.6 miles up a steep hill with sections of severe washouts and subsequent braiding. There is a spur off of this trail that accesses a former cabin site. Occasionally, OHVs are transported upriver by jet boat and stage at this former cabin site to access the trail without having to cross the river channel. Once on the ridge top overlooking the Delta River, the trail continues northwest outside the river corridor, and follows the historic Yost Trail, towards the Eureka Creek drainage. From this point the trail shows little signs of recent use by OHVs, presumably due to the difficult river crossing. Eventually, the trail crosses the outlet stream of Fish Lake, before arriving at Eureka Creek. High water volume in Eureka Creek presents an unlikely and dangerous OHV crossing. Total length of this trail is approximately 8 miles to the Delta River, and 25 miles to Eureka Creek.

3.2.10.2.3 Eureka Creek Trails

In 2006, two new unauthorized trails were discovered proceeding up the western ridge, immediately to the south of the Eureka Creek confluence with the Delta River. The only way to access these trails is to ferry OHVs upstream by boat, staging at the large gravel bar at the Eureka Creek confluence. These new trails are significantly rutted, and after an archeological inspection, one was determined to be running directly across two archaeological sites (Jangala et al 2009). One of these sites is a rare buried site that may contain intact stratigraphic context and dateable materials. The site may be eligible for the National Register of Historic Places for its potential to contribute to knowledge about prehistoric uses of the river corridor. This trail was immediately closed to protect these archeological sites.

3.2.10.2.4 Round Tangle Lake Trail

The unauthorized Round Tangle Lake Trail begins at a small paved pullout at Mile 20.8 of the Denali Highway, which is the site of the original Tangle Lakes Campground. A gravel road heads northeast to the shore of Round Tangle Lake, and becomes an OHV trail as it contours northeast around the lake, close to the lakeshore. At .6 miles the trail reconnects with the highway just across from the Tangle Lakes Inn. The trail continues along the highway shoulder for approximately 75 feet, and then continues as a foot trail to a small peninsula, ending back at the lakeshore. Total length of this trail is approximately 0.8 miles. This trail provides access to Round Tangle Lake and multiple fishing sites along the lakeshore. The initial gravel road has large potholes and deep puddles of standing water. The rest of the trail is in good condition with well drained soils, and only small sections that are wet and muddy after prolonged periods of rain.

3.2.10.2.5 Mile 22 Denali Highway North Trail

This unauthorized trail starts at MP 22 North on the Denali Highway. The trail begins in an old gravel pit, and narrows into a rutted and muddy OHV trail, contouring between the edge of a small lake and steep esker ridge. The trail eventually peaks out at approximately .8 miles, and was most likely developed as a hunting lookout. This unauthorized trail has been determined to be running directly across one archeological site (Jangala et al 2009). This site is a rare buried site that may contain intact stratigraphic context and dateable materials. The site may be eligible as a contributing property for the TLAD for its potential to contribute to knowledge about prehistoric uses of the river corridor. This trail was immediately closed to protect this archeological site.

3.2.10.3 Nonmotorized Trails Description

3.2.10.3.1 Lower Tangles Ridge Trail

This foot trail begins 100 feet to the west of the register stand at the entrance to the Tangle Lakes Campground. In the summer of 2008, extensive work was done on this trail to reduce the impacts of trail proliferation and tread sloughing that was occurring from user created spur trails originating from the Tangle Lakes Campground. The trail has been repaired using proper trail construction methods, and is now a distinguishable single track trail for the first 0.25 miles as it climbs the ridge above and west of Round Tangle Lake. Once on the ridge, the trail forks with one branch heading southwest, and the other to the north. The northern spur ends after approximately 1 mile. The other spur heads southwest, and ends on the Denali Highway near the DWSR Wayside. This trail is an exceptional candidate for an

interpretive/nature walk with informational signage regarding the cultural/ natural/geological realms and history of the region. Total length of this trail is approximately 1.9 miles.

3.2.10.3.2 Rock Creek Trail

This foot trail begins at Mile 22 South of the Denali Highway, and proceeds south into the Upper Tangle Lakes area. After a steep 50 foot elevation gain, the trail levels on a ridge and continues to the south, accessing the Rock Creek drainage. It is also possible to gain access to the ridge by walking down a closed gravel road until the lake is almost reached, and then heading up a steep game trail that connects with the trail above on the ridge. The last 0.1 mile of this trail is very steep and rocky as it drops down to Rock Creek. From this point, cross country travel is a possibility as the terrain is open and offers relatively easy travel. This trail offers outstanding views of the surrounding area. It provides access to fishing or hiking near the Rock Creek inlet into the Upper Tangle Lakes. The Rock Creek Trail is in excellent condition once the initial hill is surmounted and the ridge is gained. The initial steep section of trail leading up to the ridge may benefit from tread leveling, steps, and water control features. The rest of the trail is well drained with surface types ranging from mixed fines, cobbles, and tundra mat. The steep hill near the end of the trail could be very challenging or impossible for some hikers. This trail is a candidate for improvement measures and possibly as an interpretive walk. Total length of this trail is approximately 1.3 miles.

3.2.10.3.3 Upper Tangles Ridge Trail

This foot trail begins at Mile 21 on the Denali Highway; 100 feet to the east of the Denali Highway Bridge that crosses the Tangle River. After a steep 75 foot elevation gain, the trail levels and follows the ridge south into the Upper Tangles. The first 0.25 miles of trail are somewhat overgrown and prone to sloughing, as the trail closely follows the edge of a steep bluff. Braids exist in this area as a result of hikers avoiding the brush and exposed sections. Atop a prominent hill after about 0.75 miles, the trail splits to the east and west. The eastern trail is not commonly used and ends after 0.25 miles. The western spur continues along the esker ridges above the Upper Tangle Lakes, proceeding southwest, eventually ending atop a small hill. From this point, cross country travel is a possibility as the terrain is open and offers relatively easy travel. The trail is well drained with surface types ranging from mixed fines, cobbles, and tundra mat. Sloughing of the trail sections within the first 400 yards of trail should be remediated by simply rerouting the trail to avoid the steep ridge. Double tracks and braids should be closed to minimize impacts. This trail is a candidate for improvement measures and possibly as an interpretive walk. Total length of this trail is approximately 1.5 miles.

3.2.10.4 OHV Use and Characteristics

The DWSR corridor is a federal subsistence hunting area and the primary purpose for OHV use within the river corridor is for large game hunting. Very little recreational OHV use has been documented on any of the OHV trails in the river corridor. For most subsistence and sport hunters, these trails serve as the only means of access into the area. BLM issues federal subsistence hunting permits for both moose and caribou to local rural residents. These permits are limited to local rural residents and there is a slow upward trend based on a slowly increasing population in the Copper Basin. For example, in 1990, when the federal subsistence hunting program started, there were 593 permits issued for moose and has increased about 3% per year to 1,077 permits in 2006. The trend for caribou permits is similar.

Although current OHV use is relatively low, BLM data shows an increasing trend in motorized use across the Glennallen Field Office. In a five year period (2002-2006), overall OHV use within the TLAD increased approximately 5% per year. This is based on the five year use figures from trail counters, trail register sheets, and visual observations. Given the knowledge of increasing OHV use throughout the rest of the district, and the potential for resource damages caused by increased OHV use, OHV use characteristics were documented in the 2005 Delta River User Survey. Results indicate the following:

- Results show that most non-OHV users don’t even know OHV trails exist within the corridor, and less than a third actually has had encounters with OHVs.
- Most OHV users reported using 4-wheelers (90%), while some users reported using tracked rigs (10%).

- Approximately 33% of Top of the World Trail OHV users used a motorized boat to ferry OHVs upriver.
- Average OHV group size was three people, with duration of 2.5 days trip length.
- OHV users within the river corridor reported that low and medium level OHV impacts were acceptable, but that severe impacts were unacceptable. In contrast, most non-OHV users felt that only minimal OHV impacts were acceptable.
- OHV users within the river corridor felt that no additional OHV management is necessary in the corridor, and that access is more important than reducing impacts. In contrast, most non-OHV users felt that OHV use should be intensely managed within the river corridor, even if it reduces access.
- Most current OHV users in the river corridor strongly disagree that OHV use is a "social values conflict" (the notion that actual encounters are the problem, and "some places simply should not have any motorized use"). In contrast, 8 of 10 of the non-OHV users agree with this idea.
- A majority of all users felt that BLM should improve OHV trails to minimize places with unacceptable impacts using geoblock, planking, and water bars.
- In general, most OHV users appear to believe that potential biological impacts are the primary concern; if those are low, they do not appear to have much concern about whether OHV use changes the primitive nature of the setting. In contrast, most non-OHV users appear concerned about experiential impacts, as well as biological ones.

3.2.10.4.1 EARMP OHV Decisions

The EARMP designated the DWSR corridor as "limited" to OHVs. The EARMP directed that "OHVs would be restricted to designated trails (Top of the World Trail and Rainy Creek Trail) from May 15 to October 16, or when there is less than an average of 12 inches snow or 6 inches ground frost. These designated trails are existing routes, and will not limit access into the area for subsistence hunting or access to mining claims. This decision does not preclude the future consideration of the development of motorized or nonmotorized trails, if consistent with protection of the outstandingly remarkable values of the river corridor. If additional trails are considered for designation in the future, they would be located to minimize resource damage, maintain primitive and semiprimitive recreation experiences, and facilitate the maintenance of designated trails".

The EARMP also directed that each area designated as "limited" to OHVs would have an implementation level plan completed, showing a complete inventory of trails in the area, specific resource concerns or conflicts, and specific designated trails and conditions of limitations (seasonal, weight, or vehicle class, etc). These plans would describe the tools necessary for implementation (method of signing specific trails, trailhead development, education/interpretation, map production, and law enforcement) and would identify and prioritize specific maintenance needs, as well as opportunities for trail development or loops, both motorized and nonmotorized.

3.2.10.5 Motorized Boating Use and Characteristics

3.2.10.5.1 Use Characteristics

Motorized boating occurs throughout most reaches of the Delta River corridor, and is limited in certain areas by a combination of water depth and geography. The vast majority of motorized boating occurs on the Tangle Lakes, adjacent to the developed facilities. These lakes receive many different types of use, ranging from smaller horsepower motors attached to canoes to large jet units, with occasional inboard units as well. For the most part, these larger boats are restricted to the lakes in the immediate vicinity of the developed facilities due to the shallow waters of Long Tangle Lake. In recent years, especially during subsistence hunting season, motorized boats have ventured up the Tangle River into the Upper Tangle Lakes. Safety concerns have surfaced with increased use of the canoe loop route since nonmotorized floaters proceeding down the Tangle River can be met by motorized boats that must maintain speed to stay on step, leading to high potential for collisions. Occasionally, motorized boaters (typically with small, detachable 5 to 15 horsepower motors) will portage their boats and motors across the first portage of the Upper Tangles to access the second lake on the other side of the portage.

Motorized boating on the Lower Tangles is also limited by geography, as shallow reaches between lakes often impede travel. The first shallow reaches beyond Round Tangle Lake can typically be navigated by motorized craft, but the shallow reach between Long Tangle Lake and Lower Tangle Lake is nearly impossible to negotiate. Documented use of motorized boats is very rare beyond this point.

Motorized boating is less common on the lower Delta River than the Tangle Lakes, primarily due to the difficulty of negotiating the shallow, braided channels of the broad Delta River floodplain. The water in this stretch is glacial water, and the river is severely channelized, making motorized possible by only very experienced operators. The geography and water levels in this section may help to naturally limit motorized boating during the summer floating season, but motorized boating still occurs during the subsistence hunting season. Motorized boats are usually launched at the Mile 212.5 Richardson Highway takeout, and travel upstream to the vicinity of Garret Creek, where dispersed campsites along the river are often occupied by motorized boating groups during hunting season. Travel upstream beyond Garrett Creek is difficult due to shallow water depths, but use has been documented by BLM. In all cases, motorized boats cannot proceed upriver beyond the Delta River portage, due to a series of large waterfalls in the canyon.

Motorized boats seldom travel downriver from the Mile 212.5 Richardson Highway takeout for many of the same reasons described above. The large, glacial delta is difficult to navigate, the highway is very close to the river on the east side, and on the west side the rugged mountains of the Alaska Range effectively limit access to most recreational opportunities.

3.2.10.5.2 Management Policy and Legislative Controls

BLM policy on “wild” segments of WSRs states: “Motorized travel on land or water could be permitted, but it is generally not compatible with this river classification. Normally, motorized use will be prohibited in a wild river area.” However, Title VIII of ANILCA, § 811 allows for the “appropriate use for subsistence purposes of snowmobiles, motorboats, and other means of surface transportation traditionally employed for such purposes by local residents, subject to reasonable regulation”, and Title XI § 1110 allows for the “use of snowmachines, motorboats, airplanes, and nonmotorized surface transportation methods” within Conservation System Units for traditional activities, also subject to reasonable regulations. Title XI of ANILCA § 1110 allows for the temporary or permanent closure of such activities if the appropriate managing federal agency finds that such use would be detrimental to the resource values of the area.

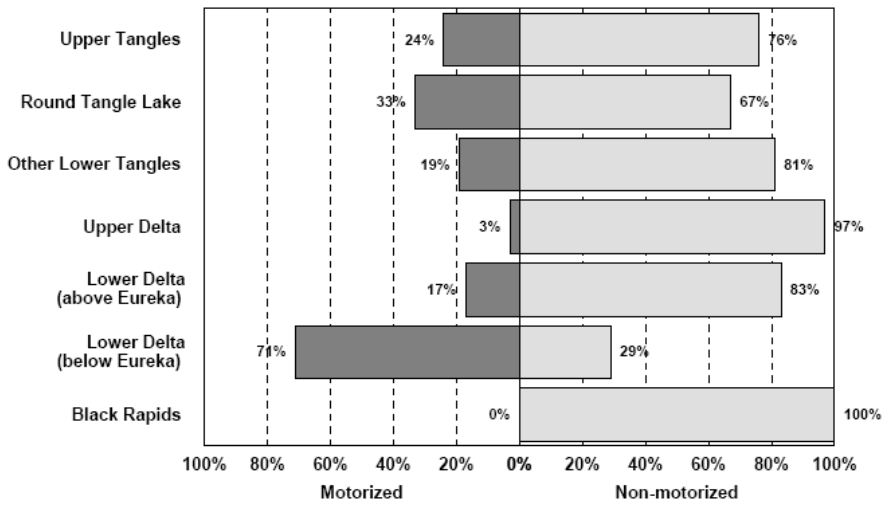
3.2.10.5.3 2005 Delta River User Survey Data

In the 2005 Delta River User Survey, respondents who use motorized boats to access the Tangle Lakes or Delta River were asked to describe boat type, length, and horsepower. Of those who reported any motorized boating use, 33% use jet boats, 31% use propeller driven boats, 23% use kickers on rafts or canoes, 3% use air boats, and 10% use other types of motorized boats. On the Lower Delta, jet boat use is most common (83%) although 17% use propeller driven boats. Boats typically ranged from 14 to 22 feet long, with a median length of 18 feet. Horsepower ranged from 20 to 350, with a median of 115 horsepower.

On the Upper Tangles, 39% or respondents use kickers on canoes or rafts, 32% use propeller driven powerboats and 14% use jet boats. On the Lower Tangles, 27% use kickers on canoes or rafts, 45% use propeller driven powerboats, 27% use jet boats, and the rest were classified as “other.” Most lake motorized boats were less than 18 feet long (median length was 15 feet) and 57% were less than 15 horsepower (the current recommended BLM limit). However, other boats had as much as 115 horsepower.

Relative proportions by segment (Figure 6) show that 67% to 100% of boats were nonmotorized, except for the Lower Delta below Eureka Creek. Considering that most of the use in the river corridor is nonmotorized, and this group generally supports motorized restrictions, BLM has considered times and places where motorized use would be limited or restricted.

Figure 6: Proportion of motorized and nonmotorized craft by segment, 2000-2004



Additional river user survey data related to motorized and nonmotorized boating from the 2005 Delta River User Survey indicates the following:

- A majority of motorized users (59%) supported restrictions on the use of personal watercraft (jetski and hovercraft), while 91% of nonmotorized users supported this restriction.
- Motorized users were generally united in opposing total motorized prohibitions, but some motorized users believed that larger motorboats may not be necessary on some lakes, or that not all lakes may be appropriate for motorized use. Small proportions (15%) of motorized users support motorized restrictions below the shallow reach downstream of Long Tangle Lake, while 37% supported a 15 horsepower restriction below Round Tangle Lake.
- Regarding the relative ranking of specific reasons for motorized boating restrictions, motorized users rated discourteous behavior at the top of their list. Safety and potential biophysical impacts were also rated highly for motorized users.
- Nonmotorized users, in contrast, rated noise, the notion that motors are inappropriate in some places, and ensuring the availability of nonmotorized experiences as their most important reasons to limit motorized use.
- Temporal zoning options (e.g. no motorized use outside of hunting season) and spatial zoning options (e.g. no motorized use on the Upper Delta), were strongly opposed by most motorized users.

3.2.10.5.4 Overflight Observations

BLM uses river overflights as one source of estimating visitor use on the Delta River. The resulting information is accurate enough to gauge use trends for different segments through use seasons and over several years. BLM flew the DWSR corridor on 37 occasions from 2000 through 2004, spacing overflights relatively evenly from June through early September. Observers counted the number of boats of various types (motorboats, driftboats, canoes, kayaks, rafts, personal watercraft, etc.) for each segment. This technique provides an accurate count of boats, but it does not attempt to count groups or the numbers of people. Of the 560 boats observed on overflights from 2000 to 2004, 422 or 75% were nonmotorized and 138 or 25% were motorized. Figure 7 displays the average number of boats per river segment (on days that any were observed) on overflights from 2000 to 2004:

Figure 7: Average number of boats per river segment (on days that any were observed)

	Upper Tangles	Round Tangle	Other Lower Tangles	Upper Delta	Lower Delta (above Eureka)	Lower Delta (below Eureka)	Black Rapids
Non-motorized boats	3.8	3.6	4.3	4.5	1.7	2.0	1.0
Motorized boats	1.9	2.1	1.9	2.0	3.4	1.7	--

3.2.10.6 Aviation

The use of airplanes within the DWSR corridor is limited because there are no existing airstrips. Occasionally, floatplanes will land on the larger lakes within the river corridor for the purpose of transporting fishermen and hunters. In the Upper Tangles there are numerous lakes, both inside and outside the river corridor, that provide opportunities for float plane landings. Dickey Lake, located adjacent to both the Delta and Gulkana WSR corridors, provides access to the headwaters of both river systems. Occasionally, float planes also land on the Lower Tangle Lakes. Float planes seldom, if ever, land on the narrow river column, due to shallow water conditions and lack of large gravel bars. BLM uses fixed wing aircraft to monitor visitor use along the river corridor. Approximately eight flights occur each summer. In addition, trumpeter swan and bald eagle productivity studies are conducted using fixed wing aircraft.

Helicopters are occasionally used by State agencies and BLM for logistical support in various resource projects. Helicopter use related to mining activities located adjacent to the river corridor has been increasing in recent years. The BLM has worked with these mining companies in the past to limit the occurrence of helicopters flying parallel to the river corridor, and has requested that these flights cross the river corridor quickly and as seldom as possible.

In 1997, the Federal Aviation Administration and United States Air Force, after conducting an Environmental Impact Statement, issued a Record of Decision that, in part, modified the boundaries of the Fox Military Operations Area (MOA) to exclude the DWSR corridor. A MOA is a Special Use Airspace designated for non-hazardous military flight activities such as air combat tactics, transition, formation training, and aerobatics. The new boundaries of the FOX MOA were situated on the western boundary of the Delta River, and include portions of the Denali Highway to the west of the river corridor. The average daily military aircraft operations in the Fox MOA is estimated to be 16 aircraft operations per day in a routine flying day and up to 80 aircraft operations per day during specialized training. BLM has and will continue to work with the FAA and United States Air Force to discuss the potential effects to recreational users by low level overflights adjacent to the river corridor.

3.2.10.7 Winter Use

The DWSR corridor is used during the winter months for trapping and late season subsistence hunting, as well as recreational use. Winter use within the DWSR corridor is relatively low, primarily consisting of snowmachining, snowshoeing, dog mushing, and cross-country skiing. Snowmachine use primarily occurs on the Denali Highway, as snow conditions in the uplands are marginal (windblown, shallow snow cover) and open water leads exist between many of the lakes in the river corridor. Respondents at the BBM meetings indicated that they had not seen a noticeable increase in wintertime use. They identified “more regulation” or “loss of access” as the biggest potential threat to wintertime use in the DWSR corridor. The EARMP directed that snowmachines may be temporarily limited to designated trails to minimize disturbances to heavy concentrations of wintering moose within the river corridor, but limits have not been implemented.

3.2.10.8 Animal Powered Recreation

Animal powered recreation occasionally occurs within the DWSR corridor. In most cases, this involves the use of horses and pack stock to explore the surrounding hills and countryside, and dog sled teams that are used in the winter, primarily on the Denali Highway. During the BBM meetings held in 2007, there were some participants who said they used horses and pack stock in the Garrett Creek drainage and throughout the lower river corridor. BLM has never visually observed horses or pack stock being used in the backcountry within the river corridor, but on a few occasions groups have camped at the Tangle Lakes Campground with horses and pack stock. These groups usually tow their horse trailers to the campground, set up a temporary corral, distribute hay within the campsite, and ride their horses throughout the developed facilities and along the Denali Highway. The primary concerns associated with animal powered recreation in the DWSR corridor is the possibility of introducing invasive and/or noxious weeds in hay used for horse fodder, as well as straw used to bed down sled dogs during the winter, and animal feces left behind in the developed facilities.

3.2.10.9 Mechanized Travel

Mechanized travel refers to the use of mountain bikes, wheelchairs, and other modes of non-gasoline powered assisted travel. Mechanized travel occurs primarily in the developed facilities and on the Denali Highway, and has never been documented in the uplands or backcountry areas. Mechanized travel would be difficult on designated OHV trails due to degraded trail conditions, but would be possible on more developed trails, such as those that are located adjacent to the Denali Highway.

3.2.11 Vegetation

Within the DWSR corridor, vegetation reflects differences in slope, aspect, soils, elevation, moisture availability, and the presence or absence of permafrost. Vegetation cover types range from herbaceous and scrub communities (Alaska Vegetation Classifications IIC and IIIA; Viereck 1992) in the upper Tangle Lakes area to needleleaf forests and woodlands, and mixed forests (Alaska Vegetation Classification IA, and IC, Viereck 1992) in the lower reaches of the river. Vegetation in the Tangle Lakes area includes low shrub birch/lichen, mesic shrub tundra, tussock tundra and open taiga. Permafrost occupied sites are commonly represented by cottongrass tussock and dwarf birch-ericaceous scrub vegetation. Alpine communities are interspersed with patches of lichen. Sparse patches of trees are found at elevations below 3,100 feet including white and black spruce, balsam poplar and alder. Many people travel to the Tangle Lakes area to pick blueberries. Other berries found in the area include crowberry, alpine bearberry, low bush cranberry, high bush cranberry, and red currant.

The abundant shrubs cover types in the river corridor are dominated by dwarf birch, willows and alder. A number of herbs, grasses, mosses, and sedges are also found throughout the area. Plant communities along the mid and lower sections of the river corridor include riparian scrub on flood plains with open spruce-poplar-alder forests occupying higher floodplains and lowland sites along the river, and some mid slopes of hillsides adjacent to the river. Understory plants are varied and abundant. Grasses are the dominant herbaceous species. Fireweed, bistort, alpine azalea, rose, horsetails, ferns, mosses, lichens, Labrador tea, cassiope, mountain-avens, burnet, and shrubby cinquefoil are among the many other plants found in this area.

Currently the vegetation cover types along the Delta River provide diversity to fulfill healthy habitat needs for fish and wildlife along the river. Forestry practices are allowed within Special Recreation Management Areas. Within the DWSR commercial logging is not permitted, and minimally permitted firewood gathering occurs on a personal use basis. Wildfires have a limited affect on landscapes and plant communities of the Delta River Area. Evidence of fire, such as charcoal, is rarely observed in area soils. Based on preliminary findings of a 2009 rare plants inventory conducted on the Upper Tangles and Delta River by the Alaska Natural Heritage Program (Carlson 2006), no rare plants or BLM Sensitive Status Species of plants were found or documented at sites visited.

3.2.11.1 Invasive, Non-native Plant Species

The introduction and spread of non-native invasive plants (weeds) in Alaska has become a concern. Invasive plant species are more prevalent in urbanized areas and along travel corridors where vehicles transport seeds throughout Alaska. Weed control efforts to date have been primarily concentrated on increasing public awareness and prevention. There are currently 14 plant species on the State of Alaska Restricted Noxious Weeds lists, of which none are found within the DWSR. An inventory of non-native invasive plants within the Delta River corridor was conducted during the summer of 2008 by the University of Alaska Anchorage Natural Heritage Program (Cortez-Burns 2009). This assessment found the river corridor relatively free from non-native invasive plants. Only the BLM Tangle Lakes Wayside boat launch was found to hosts small infestations of invasive plants, all of which rank low for aggressiveness and are listed below:

- common plantain, *Plantago major*
- annual bluegrass, *Poa annua*
- chickweed, *Stellaria media*
- pineapple weed, *Matricaria discoidea*
- common dandelion, *Paraxacum officinale*

None of these species were present in percent covers greater than 20% and none are considered to be capable of invading undisturbed native vegetation in Alaska, except for the common dandelion, which is widespread across the state and possibly hybridizes with native dandelion. These infestations are prioritized for control and eradication.

3.2.11.2 Vegetation Management Concerns Related to Recreational Activities

The primary management concerns related to vegetation resources and recreational use are the development of unauthorized OHV trails, vegetation trampling at river campsites, and the introduction of invasive weeds. Unauthorized OHV trails are not maintained and can result in additional trail proliferation, potentially impacting vegetative resources through vegetation loss and compaction. Visitor use along the river has resulted in the development of dispersed campsites. Vegetation trampling is evident at almost all of the campsites along the river, ranging from slight trampling to the removal of all vegetation cover and soil compaction, resulting in bare ground. Vegetation impacts also include cutting of live trees for firewood, game poles, or tent poles. Noxious and invasive weeds may be more prevalent near settled areas, but their populations are suspected to be increasing in remote areas as well. OHV use (especially summer and fall use), communication sites, right-of-way development, hiking and climbing, trail construction, nonmotorized recreational activities, and utility systems or other development activities could result in increased infestations of noxious or invasive plant species (CNIPM 2001).

3.2.12 Water Quality

The DWSR can be characterized as a free-flowing river with excellent water quality. There are numerous examples of pristine natural conditions, including cascading waterfalls, seasonally continuous rapids, meandering river oxbows, and an active flood regime. Largely intact hydrologic processes create a diversity of exceptional hydrologic features, and contribute to the integrity of river-related ecosystems. The DWSR is a clear water river from the headwaters near Dickey Lake to the confluence with Eureka Creek. From Eureka Creek to the end of the corridor boundary, the river becomes heavily laden with glacial sediment. The free-flowing nature of the river, adequate volume, and relatively protected watershed generally provides superior water quality.

Information from the U.S. Geological Survey, the Environmental Protection Agency, the University of Alaska and the State of Alaska does not indicate that there are any system-wide concerns at the present with water quality in the Delta River. BLM water quality monitoring on the Delta has been minimal and has consisted of samples taken with uncalibrated BLM water quality instruments at various clear water locations between 2000 and 2003. Measurements of dissolved oxygen, turbidity, pH, temperature, and specific conductivity indicate water quality is within state standards and well within the ability to sustain healthy fisheries as indicated by a recent ADF&G Arctic grayling study.

Turbidity on the Delta River clear water system is somewhat influenced by natural processes. The upper portion of the corridor is a wide valley with a highly interconnected and stable low gradient lake and river system. The stream channel is stable due to the presence of cohesive bank materials and developed riparian vegetation. Once below the falls, where the Delta River crosses the Denali fault, the river valley is more constricted on both sides by a mountain lined valley, resulting in gradient and water velocity increases. The river occasionally splits into two or more braids, but the channel is stable and the riparian vegetation is well developed. The valley gradually opens up and the clear water system slows and meanders. Within the clear water section, the sediment supply and bed load contributions during high water events is relatively low. Once below Eureka Creek (the first glacial tributary), the Delta river becomes turbid and braided with the intrusion of glacial sediment from tributary glacier creeks and high mountain snow melt. Major glacial tributaries include: Eureka Creek, Rainy Creek, Phalen Creek, and Black Rapids Glacier.

3.2.12.1 Water Quality Concerns Related to Recreational Activities

Water quality concerns are related to human waste disposal, petroleum hydrocarbons from boat motors, OHV use and campsite use. Human waste is disposed of in a variety of manners, dependent on river users, outdoor skills and river ethics. Increased use and improper human waste disposal methods could potentially impact water quality. Although there has been no water quality testing done for fecal coliform

on the Delta River, BLM assumes the levels for fecal coliform would conform to State water quality standards. The State of Alaska currently has regulations prohibiting the disposal of human waste within 100 feet of the ordinary high water mark of a lake or river.

Some amount of the fuel that enters into boat motors is discharged into the water unburned. Numerous studies have documented the effects of outboard motor exhaust and related pollution from fuel leakage, although most apply to contained water environments, (e.g. lakes and marinas). Considerably less work has examined the impacts of these pollutants in rivers. Even in existing, "closed system" studies, toxic effects on aquatic organisms are generally minimal because 1) the amount of pollution is often small compared to the volume of water; and 2) most hydrocarbons are volatile and quickly dispersed. (The Effects of Motorized Watercraft on Aquatic Ecosystems, Asplund, 2000). The current federal water quality standard adopted by the State of Alaska for petroleum hydrocarbons, oils, and grease in waterbodies is: "Total aqueous hydrocarbons in the water column may not exceed 15 ug/l. Total aromatic hydrocarbons in the water column may not exceed 10 ug/l. There may be no concentrations of petroleum hydrocarbons, animal fats, or vegetable oils in shoreline or bottom sediments that cause deleterious effects to aquatic life. Surface waters and adjoining shorelines must be virtually free from floating oil, film, sheen, or discoloration."

The Top of the World Trail is the only designated OHV trail that crosses the clear water section of the river corridor, a few miles above the Eureka Creek confluence; erosion is highly evident on both the eastern and western hillsides adjacent to the Top of the World Trail. Unmanaged trails and river crossings in this clear water section has the potential to impact water quality by contributing sediment to the river. Visitor use on the river has increased the concern for potential bank erosion and increased sedimentation caused by bank trampling. BLM monitors bare ground at campsite access points along the river. So far, trampling impacts are primarily limited to vegetation and soil compaction, although some erosion is occurring at popular campsite areas.

3.2.13 Wilderness Characteristics

There are no designated wilderness areas or wilderness study areas within the planning area, but there are areas that possess outstanding opportunities for solitude or a primitive and unconfined recreation experience, and high levels of naturalness. These attributes are comparable to characteristics that are commonly found in areas designated as "wilderness", and are most often present in primitive and semiprimitive nonmotorized ROS classification areas. Within the DWSR corridor, these areas would include the Upper Tangles and portions of the Delta River in the vicinity of the river portage. ROS classification areas for the DWSR corridor are discussed in Chapter 3.2.6.6.

3.2.14 Wildlife

The DWSR corridor supports large and small mammals and furbearers, birds and waterfowl, numerous insects, and an amphibian. Wildlife composition and density vary by season and by habitat type along the river. Large mammals that may be encountered within the DWSR corridor include moose (*Alces alces*), caribou (*Rangifer tarandus*), and bears (*Ursus americanus* and *U. arctos*). Since the DWSR corridor is also a federal subsistence hunting area, these large mammals are hunted by qualified residents for food and other traditional uses. Moose taken along the Delta River constituted approximately 29% of successful federal subsistence moose hunts in GMU 13 in 2008. Moose populations are monitored closely by the Alaska Department of Fish and Game (ADF&G) in several count areas. Count area 5 includes portions of the Delta River and averaged 1393 moose within 846 square miles between 1990 and 2007 (ADF&G), and is generally stable.

Caribou from the Nelchina Caribou Herd (NCH) migrate in large numbers in the spring and fall as they travel to and from winter and summer grounds, often crossing the Delta River near the foothills of the Alaska Range. The NCH population is below the target set by ADF&G of 35,000 animals as of 2008. However, active management efforts by the ADF&G are in place to facilitate an increase in the moose and caribou population. Caribou move in large numbers across the DWSR corridor, and these sightings provide recreationists and hunters a spectacular close-up view of one of North America's greatest natural animal movements.

Small mammals and furbearers also utilize the DWSR corridor and are of interest to local trappers, subsistence users, and other carnivores including resident raptors. Harvest efforts for furbearers including wolves (*Canis lupus*), marten (*Martes americana*), and lynx (*Lynx canadensis*) typically follow the price of fur. Resident raptors depend on small mammals for food in the winter. The population of small mammals and furbearers is generally stable in the DWSR corridor.

Migratory birds and waterfowl can be seen on the river and lakes within the DWSR corridor. Spring migration brings approximately 130 species of birds into Alaska, a portion of which likely cross the DWSR corridor and may even stopover in nearby lakes. The DWSR corridor provides nesting and rearing habitat for numerous waterfowl and other migratory birds. Some songbirds take advantage of the abundant supply of insects that emerge in the spring. These insects not only provide essential forage for birds, but are also important food sources for fish. Fish, in turn, become essential food for bears and bald eagles.

There are no birds or mammal species within the Delta River watershed that are listed by the U.S. Fish and Wildlife Service as threatened or endangered. The presence of six species of birds and one species of mammal that Alaska BLM considers sensitive species are suspected to occur within the Delta River watershed, but are undocumented.

3.2.14.1 Wildlife Management Concerns Related to Recreational Activities

There are three major concerns related to recreational activities in the DWSR corridor. These concerns are OHV use, motorized boating, and human-bear interactions. Human activity along the DWSR corridor is likely to increase as recreational demands grow and technology advances. Impacts from increased OHV use by hunters and recreationists may further fragment moose and caribou habitat. Increased human visitation may also affect migratory birds and waterfowl that nest along the river and lakes of the DWSR corridor. Areas that were previously inaccessible to boaters may become accessible using shallow-drive boats. Motorized boats and airplane landing in these areas may cause harassment to nesting waterfowl and other wildlife. Increased human traffic can interfere with nesting waterfowl and may cause wildlife to expend energy in avoidance or stress-induced behavior. Another concern resulting from increased human activity in the DWSR corridor is bear-human interactions. Current levels of bear encounters appear to be low, although documentation of such encounters is sporadic and not well recorded. However, with increased human presence, the likelihood of human-bear interactions in the future may increase.

4.0 ENVIRONMENTAL IMPACTS

4.1 Introduction

The analysis of environmental impacts associated with each action alternative is required by BLM planning regulations and by the Council on Environmental Quality (CEQ) regulations implementing the NEPA. Environmental impacts are described by resource or issue, and include direct, indirect, and cumulative effects of the alternatives. The type and level of effects that could result from implementing the alternatives have been identified using the information provided in Chapter 3, which provides a description of the current condition of the environment. This chapter describes the predicted consequences, or potential effects, from implementing the alternatives described in Chapter 2. Effects analysis and conclusions are based on interdisciplinary team knowledge, information provided by BLM or other agency experts, pertinent literature review, and professional judgment.

4.2 Direct and Indirect Impacts

Direct effects result from activities planned or authorized by BLM and occur at the same time and place. Indirect effects are caused by these actions and occur later in time, or farther removed in distance, but are still reasonably foreseeable. Effects will be described as having a beneficial effect (the resource or condition is enhanced/benefitted, or the user group's activity and/or experience is enhanced), no change (no change or little to no effect), or not a beneficial effect (adverse effect).

4.2.1 Climate Change

4.2.1.1 Effects of recreation management decisions to contributing causes of climate change within the DWSR corridor.

Alternative 1 (No Action Alternative):

Recreational activities that produce greenhouse gas emissions result from the operation of gasoline powered engines; and include activities such as the use of OHVs, snowmachines, aircraft, generators, and motorized boats. At current visitor use levels, the overall contribution of greenhouse gas emissions related to these activities is negligible and would not themselves result in global warming and climate change, when compared to total greenhouse gas contributions worldwide.

Alternatives 2 (Proposed Action), 3 and 4:

The effects from all of these alternatives are substantially similar related to contributing causes of climate change. Because Alternatives 2 and 4 restrict boating and airplane landings and have more restrictions on OHV use, the greenhouse gas emissions in these alternatives are expected to be slightly less than the emissions in Alternative 3. However, on a global scale, while any greenhouse gas emissions are considered to have a negative effect on climate (resulting in global warming and climate change), these incremental emissions are considered extremely minor and would not adversely affect climate within the planning area.

4.2.2 Cultural Resources

4.2.2.1 Effects to cultural resources from recreational facility development and campsite management decisions.

All Alternatives:

All ground disturbing activities, including facility development, require compliance with Section 106 of the National Historic Preservation Act of 1966. This compliance reduces the possibility of impacting sensitive cultural resources.

Alternative 1 (No Action Alternative):

Archaeological sites impacted by campsite growth or expansion may have their significance adversely affected under this alternative because there are fewer management actions aimed at curbing campsite growth and proliferation. It is most likely under this alternative that there would be adverse effects to cultural resources if unmanaged campsites continue to proliferate in number and increase in bare ground area. It is possible to have locations on the National Register of Historic Places irreparably impacted through the loss of vegetation and consequent soil erosion, which can damage or destroy stratigraphic context, as well as fragile organic artifacts or cultural features. Because there are long lived landforms in the river corridor with gentle slopes, favorable aspects, and access to water, there are many prehistoric sites that are also in areas attractive to modern campers. Several archaeological sites co-occur with modern campsites.

Alternatives 2 (Proposed Action), 3 and 4:

Alternatives 2, 3, and 4 are likely to reduce adverse impacts to buried archaeological resources that co-occur with campsites because these alternatives designate campsites, limit group sizes, and control campsite expansion and soil erosion through campsite management actions that are based on the monitoring of bare ground standards. Similar to Alternative 1, any development of new campsites may adversely affect cultural resources. Alternative 3 would have a slightly greater possibility of impacting cultural resources since more campsites would be developed and existing heavy and moderate impact sites would be hardened and expanded to accommodate larger groups and increased use. Alternative 4 would have a slightly higher possibility of protecting cultural resources since additional campsites would not be developed and group sizes would be less than Alternatives 2 and 4.

4.2.2.2 Effects to cultural resources from OHV management decisions.

All Alternatives:

For all action alternatives, OHVs are required to stay on designated trails in the TLAD. There are no designated OHV trails in the portions of the TLAD that occur within the planning area, and the use of OHVs is only allowed during periods of adequate snow cover. Thus, potential adverse impacts to cultural resources from OHV use are not expected in the TLAD under any action alternative.

Alternative 1 (No Action Alternative):

Unauthorized OHV trails have the potential to adversely impact cultural resources, and at least one known archaeological site at Mile 22 Denali Highway North Trail and two known archeological sites at the confluence of Eureka Creek are currently being impacted. OHV use on unauthorized trails strips protective vegetation and mechanically disturbs soils, resulting in soil deflation and loss of stratigraphic context for buried archaeological remains. This is likely to negatively affect the National Register significance of these sites and result in the loss of irreplaceable information important to the knowledge of the area's prehistory. OHV use also allows the public to more easily access the backcountry which may lead to looting and vandalism of more obvious cultural resources.

Alternatives 2 (Proposed Action) and 4:

Under Alternatives 2 and 4, the requirement to stay on designated trails, a 2000 lb. GVW limit on OHVs, and the closure of unauthorized trails will reduce adverse effects to archaeological resources by protecting soils and vegetation that covers both known and unknown archeological sites. The closure of two unauthorized OHV trails in RMZ 5 and one unauthorized OHV trail in RMZ 2 will protect three known archeological sites that are currently being adversely impacted by OHV use.

Alternative 3:

Under Alternative 3, the designation of two additional OHV trails near the confluence of Eureka Creek in RMZ 5 and the Mile 22 Denali Highway North Trail in RMZ 2 is likely to adversely impact both known and undiscovered cultural resources. Continued OHV traffic in these areas is likely to adversely affect the National Register significance of these sites and result in the loss of irreplaceable information important to

the knowledge of the area's prehistory. This activity can also contribute to additional adverse impacts, including looting and vandalism of more obvious cultural resources.

4.2.2.3 Effects to cultural resources from identifying ORVs.

Alternative 1 (No Action Alternative):

Alternative 1 would not establish ORVs for the DWSR corridor. The failure to identify ORVs for the DWSR in ANILCA makes it impossible to protect and enhance the ORVs that were the original basis for designation. The protection and enhancement of ORVs is one of the primary goals of Section 1(b) of the WSRA. Furthermore, additional protections provided in Section 7 of the WSRA would not be available for future projects within the bed and the banks of the river. This would have an overall adverse effect on cultural resources.

Alternatives 2 (Proposed Action), 3 and 4:

Proposing Cultural Resources as an ORV in the *Wild* and *Scenic* river classification segments will have a beneficial effect by increasing public awareness about the ancient human use of the river corridor and the sensitivity of archaeological resources. Cultural Resources will also be given extra protection beyond existing cultural resource laws since the WSRA requires all authorizations to be compatible with protecting the ORVs.

4.2.3 Fisheries

4.2.3.1 Effects to fisheries habitat from OHV trails and OHV river crossings.

Alternative 1 (No Action Alternative):

Under Alternative 1, trails would continue be managed under the EARMP, which limits OHV use to two designated OHV trails (Top of the World and Rainy Creek Trails). Alternative 1 allows users to travel off designated trails for game retrieval and does not establish GVW restrictions or close unauthorized OHV trails. This would lead to the greatest potential for adverse effects caused by streambank destabilization, riparian vegetation loss, erosion, and sedimentation from unauthorized and unpermitted trail crossings in the clear water portions of the Delta River, where results of a recent Delta River Arctic grayling study in this area showed one of the greatest densities ever recorded for a population of Arctic grayling ≥ 270 mm length (Gryska, in preparation).

Alternatives 2 (Proposed Action) and 4:

Alternatives 2 and 4 would close four unauthorized OHV trails in the DWSR corridor. The objective of closing unauthorized OHV trails would be to prevent the unmanaged proliferation of trails crossing and paralleling the river. Limiting OHV use to designated trails and river crossings would preserve existing OHV access and would ensure that trails and crossings are located in appropriate, sustainable locations to minimize damage to sensitive fisheries habitat. Additionally, a GVW restriction of 2000 lbs. would reduce the potential for soil compaction and reduce the development of mud holes and rutting caused by larger OHVs. These alternatives reduce the potential for stream destabilization, riparian habitat degradation, and erosion and sedimentation that could potentially be deposited into the river during heavy rainfall or during spring run-off, thereby benefiting fisheries habitat.

Alternative 3:

Under Alternative 3, there would be four additional designated OHV trails, no GVW limitations on OHV use, and OHVs would be allowed to travel off designated trails for game retrieval. This would increase the potential for stream destabilization, riparian habitat degradation, erosion and sedimentation into the river, adversely affecting fish habitat. Sensitive arctic grayling habitat would likely decline.

4.2.3.2 Effects to fisheries habitat from motorized boating decisions.

Alternative 1 (No Action Alternative):

Under Alternative 1, motorized boating is managed under the 1983 DWSR Management Plan, which recommended a limitation of 15 horsepower motors within the scenic classification segment and no other limitations on motorized boating throughout the rest of the river corridor. No additional restrictions would limit the use of motorized boats, and the potential for adverse effects to fisheries habitat would be increased relative to Alternatives 2 and 4.

Alternative 2 (Proposed Action):

Alternative 2 proposes to seasonally limit the use of motorized boats in RMZs 1 and 4, reducing the frequency of motorized boating during June and July. Subsistence users and those seeking access for traditional activities could request authorization from the BLM Glennallen Field Office to use motorized boats during the seasonal closure. The implementation of these management actions will help to protect fisheries habitat in the Upper Tangles (RMZ 1) and in the lower Delta River (RMZ 4), where concentrations of Arctic grayling occur at record densities, while still providing access for subsistence and traditional activities. The level of use related to subsistence and traditional activities in RMZs 1 and 4 would be monitored, allowing BLM to assess levels of use and potential adverse impacts to fisheries in the future. This would have an overall beneficial effect to fisheries resources.

Alternative 3:

Alternative 3 emphasizes motorized boating use with no restrictions, allowing for similar levels of motorized boating as Alternative 1. There would not be a seasonal limitation on the use of motorized boats within RMZs 1 and 4; consequently, Alternative 3 would have a greater potential for adverse effects to fisheries resources caused by streambank destabilization, erosion, and sedimentation from unrestricted motorized boating. The level of motorized boating use related to subsistence and traditional activities in RMZs 1 and 4 would be not be monitored, reducing BLM's ability to assess levels of use and potential adverse impacts to fisheries in the future.

Alternative 4:

Alternative 4 proposes the greatest restrictions on motorized boating within all RMZs by limiting certain types of uses altogether, and by establishing seasonal limitations and horsepower restrictions. This would result in the greatest protection of fisheries habitat compared to all other alternatives.

4.2.3.3 Effects to fisheries resources from identifying ORVs.

Alternative 1 (No Action Alternative):

Alternative 1 would not establish ORVs for the DWSR corridor. The failure to identify ORVs for the DWSR in ANILCA makes it impossible to protect and enhance the ORVs that were the original basis for designation. The protection and enhancement of ORVs is one of the primary goals of Section 1(b) of the WSRA. Furthermore, additional protections provided in Section 7 of the WSRA would not be available for future projects within the bed and the banks of the river. This would have an overall adverse effect on fisheries resources.

Alternatives 2 (Proposed Action), 3 and 4:

The effects of proposing Fisheries as an ORV in the *Wild* river classification segment will be beneficial by protecting a world-class Arctic grayling fishery and habitat. Few rivers anywhere in the world can match the quality and quantity of the Arctic grayling fishery in the DWSR. The Fisheries ORV and WSRA management objectives will help to protect sensitive riparian areas, the river's free-flowing character, instream flow, water quality, and important fisheries habitat. The Fisheries ORV is consistent with the National Fish Habitat Action Plan, because it is designed to contribute to maintaining or restoring the watershed over the long term.

4.2.4 Lands and Realty

4.2.4.1 Effects of recreation decisions on access to State lands, private land parcels, and mining operations that are located adjacent to the DWSR corridor.

All Alternatives:

Authorized rights-of-way include the PLO 5150 Transportation and Utility Corridor, which is primarily identified with the Trans Alaska Oil Pipeline System (TAPS), but is also reserved as a utility and transportation corridor for future pipeline or electrical transmission needs. In accordance with the provisions of the WSRA and Title XI of ANILCA, new transportation and utility systems may be permitted within WSR corridors. ANILCA Sections 1104 and 1105 provide applicable standards for granting such authorizations. In addition to the consideration of the factors set forth in Section 1104 (g) (2), such an authorization would be granted if (1) it is in the public interest; (2) it would be compatible with WSR values for which the subject river involved was established; and (3) there is no economically feasible and prudent alternative route or location. This procedural review would mitigate potential adverse effects from authorizing future transportation and utility systems proposals within the DWSR corridor, and would apply to all alternatives.

Alternative 1 (No Action Alternative):

Current management under Alternative 1 provides for access to state lands, private land parcels, and mining operations adjacent to the river corridor. There are no motorized boating restrictions, and the only restriction to OHV use is the requirement to use designated trails (Top of the World and Rainy Creek Trails) within the river corridor. These trails provide access to state lands and mining operations that are located adjacent to the river corridor.

Alternatives 2 (Proposed Action) and 4:

Alternatives 2 and 4 propose seasonal limitations on motorized boating and airplane landings within RMZs 1 and 4, but this does not affect access to state lands, private lands, or mining operations because there are no active mining claims, state lands, or private land within RMZs 1 and 4. Lands adjacent to RMZs 1 and 4 are state-selected lands and current access via foot and the Landmark Gap OHV trail will not change. OHV management actions in RMZ 5 will not limit access to state lands or mining operations because trails that have been traditionally used to access these areas will remain open to OHV use. The closure of four unauthorized OHV trails (Round Tangle Lake Trail, Mile 22 Denali Highway North Trail, and two Eureka Creek Trails) will not adversely affect access to state lands, private lands, or mining operations because they are not trails that have been traditionally used to access these areas.

Alternative 3:

Same as Alternative 1, except four additional OHV trails would be designated open to OHV use. Two new OHV trails in the Eureka Creek drainage would increase access to state lands west of the DWSR corridor. The other two trails in the vicinity of the Denali Highway are short, user created spur trails off the Denali Highway, and would not substantially benefit access to state or private lands if designated open to OHV use.

4.2.4.2 Effects of potential property acquisition by BLM in the DWSR corridor.

All Alternatives:

The EARMP specified that the DWSR would be an emphasis area for the acquisition of private lands through purchase or exchange for the purposes of long-term Federal management and retention. Under all alternatives, property acquisition within the river corridor would be considered by BLM when private lands are available for purchase. The primary goal of the acquisition of available parcels is to protect the river corridor viewshed from impacts associated with the development of buildings, structures, and access roads. This would have a beneficial effect on scenic resources, as all private lands within the river corridor are located adjacent to the Denali Highway, and if retained by BLM, would be restored to their

natural, primitive state and be managed according to Class 1 VRM objectives. Adverse effects of property acquisition include a negative public perception of BLM acquiring more land for long term federal ownership that would otherwise be available for private ownership, as these parcels are the only parcels not owned by BLM, and are located adjacent to the Denali Highway, providing easy access for private development.

4.2.5 Natural Quiet and Natural Sounds

4.2.5.1 Effects of recreation decisions on natural quiet and natural sounds present within the DWSR corridor.

Alternative 1 (No Action Alternative):

Under Alternative 1, artificial noise sources associated with recreational use would persist due to the lack of management actions that would reduce contributing causes of noise. Without any limitations on group size, user capacity, chainsaw use, recreational shooting, and the operation of gasoline powered engines, artificial noise will increase commensurate with increases in visitor use. This would have an overall adverse effect on natural quiet and natural sounds within the river corridor when compared to all other alternatives, since other alternatives would prescribe various management actions that would reduce some aspects of artificial noise.

Alternative 2 (Proposed Action):

Alternative 2 proposes seasonal limitations on motorized boating and airplane landings in RMZs 1 and 4, having a beneficial effect of reducing artificial noise sources when compared to Alternatives 1 and 3, which provide for higher levels of motorized boating and airplane landings. Artificial noise associated with OHV use would decrease with the closure of four unauthorized OHV trails. Implementing a group size limitation, user capacity limitations, and restrictions on recreational shooting and chainsaw use would have a beneficial effect of preserving natural quiet and natural sounds, as compared to Alternatives 1 and 3, which do not limit the use of chainsaws and allow for larger group sizes and a higher threshold for user capacity limitations.

Alternative 3

Alternative 3 would not prescribe limitations on the use of motorized boats or airplane landings, and OHV use would be allowed on four additional trails, having the overall effect of producing more artificial noise when compared to Alternatives 2 and 4. A larger group size limitation of 12, higher user capacity thresholds and no restrictions on the use of chainsaws in this alternative would result in more artificial noise, adversely affecting natural quiet and natural sounds.

Alternative 4

Same as Alternative 2, except Alternative 4 proposes more limitations on motorized boating within the river corridor, a smaller group size limitation of 8, and lower user capacity thresholds. Consequently, Alternative 4 would have the greatest beneficial effect on preserving natural quiet and natural sounds when compared to all other alternatives.

4.2.6 Recreation Resources: Facilities and Visitor Management

4.2.6.1 Effects of proposed recreational facility developments on the natural and primitive character of the DWSR.

All Alternatives:

In all alternatives, the Tangle Lakes Campground will be renovated, reducing adverse impacts to vegetation resources by establishing designated campsites. Public use cabins would not be considered for development anywhere within the river corridor, eliminating the potential for adverse impacts (ground compaction, creation of satellite campsites, cut trees, etc.) that are commonly associated with public use

cabins. The designation of campsites at the campground and lack of public use cabins will benefit the natural and primitive character of the river corridor

Alternative 1 (No Action Alternative):

Under Alternative 1, the overall scope and long term plan for future facility developments within the river corridor would not be identified. Facility developments (campsites, outhouses, boater registration kiosks, etc.) tend to attract increased use, exacerbating impacts associated with ground compaction, creation of new satellite sites and social trails and vegetation trampling. Without any group size limitations or river campsite management standards, the potential exists for increased impacts to campsites. Heavy use sights and signs of human impacts detract from the natural and primitive character of the river corridor.

Alternative 2 (Proposed Action):

Alternative 2 identifies the scope and long term plan for future facility developments, with the primary goal of preserving natural setting characters that have been prescribed for each RMZ. Proposed facility management actions in Alternative 2 include removing the outhouse, river survey box, and boater registration kiosk at the river portage in RMZ 4. These facilities tend to attract increased use, exacerbating impacts from ground compaction, creation of satellite sites and social trails, and vegetation trampling. Group size limitations and campsite management actions will reduce the potential for campsites to grow larger, and as a result, bare ground expansion and riverbank erosion will decrease. Campsites with substantial riverbank erosion will be rehabilitated, improving the natural and primitive character throughout the river corridor. In RMZ 5, new facilities will be added at the river takeout, including a river survey box, takeout warning signs, and a boater registration kiosk. These facilities will reduce the naturalness and primitive character of this area when compared to the absence of any facilities, but the beneficial effects of user safety and data collection outweigh the adverse effects to natural and primitive character. These facilities will be located next to the parking area where signage and user facilities are generally expected for convenience and safety.

Alternative 3:

Under Alternative 3, one new outhouse and boater registration kiosk would be constructed in the Upper Tangles (RMZ 2), and a river survey box, boater registration kiosk, and increased river warning signage would be installed at the Delta River portage (RMZ 4) and Mile 212.5 Richardson Highway takeout (RMZ 5). These types of sites tend to attract concentrated visitor use, resulting in vegetation trampling, ground compaction, and increased social trails and satellite sites. These impacts may be highly visible and detract from the natural and primitive character. In addition, the placement of permanent fire rings and picnic tables is proposed at heavy use sites throughout the river corridor. Permanent metal fire rings encourage the building of larger fires, which on upland sites can lead to additional tree cutting. Larger group size limitations and campsite management actions under this alternative will increase the potential for river campsites to grow larger more quickly, and bare ground compaction, vegetation trampling, and riverbank erosion will be greater when compared to Alternatives 2 and 4.

The installation of river survey boxes, takeout warning signs, and boater registration kiosks will reduce naturalness and primitive character, but would also be beneficial by increasing visitor safety and visitor use data collection. These facilities will be located in areas already impacted by concentrated use, and are generally expected for convenience and visitor safety. This alternative would provide for more comprehensive river use data collection, and increased river user safety when compared to all other alternatives.

Alternative 4:

Alternative 4 seeks to preserve natural and primitive character by limiting future facility developments to the Tangle Lakes Campground renovation and by removing all signs and existing river facilities in RMZs 1, 2, 4, and 5. The removal of the outhouse and facilities at the river portage and the potential for rehabilitation or closure of heavily impacted campsites would have a beneficial effect of reducing associated impacts (ground compaction, damaged vegetation, litter, etc.). No other facilities would be proposed, and consequently, this alternative is most beneficial in maintaining natural and primitive character when compared to all other alternatives. The elimination of all river signage, boater registration

kiosks, and river survey boxes would enhance natural and primitive character, but would also have the adverse effect of reducing the collection of important visitor use information and reducing visitor safety with the removal of river warning signs.

4.2.6.2 Effects of the proposed user capacity management decisions on a user's ability to have positive recreational experiences within the DWSR corridor.

Alternative 1 (No Action Alternative):

Alternative 1 offers no strategies to reduce impacts from visitor use increases. Data discussed in Chapter 3 shows that current visitor use levels are creating impacts that are approaching user tolerances on some river segments. As unmanaged visitor use levels increase, impacts that exceed user tolerances can be expected. This would result in a lower visitor experience quality rating, and would change the type of experience offered on some river segments and during some visitor use seasons, particularly within RMZs 1 and 4. Lower quality or a change in expected recreational experiences may displace users to other river segments, visitor use seasons, or other areas entirely. Higher use levels will also create increased social conflicts among users, particularly between motorized and nonmotorized users.

Alternative 2 (Proposed Action):

Alternative 2 would manage increased visitor use by implementing an adaptive management approach to address camp encounters, camp sharing, and camp competition. Group size limitations of 10 people per campsite (larger groups would still be allowed with written authorization) would help to protect campsites from increased resource impacts caused by larger groups. Designating campsites would allow users to choose campsites to reduce camp encounters and camp competition, and control the development of user created campsites. A phased approach of implementing a voluntary registration system before a mandatory permit system would help to maintain tolerable user capacities, without implementing mandatory permit systems unless absolutely necessary. All of these actions would benefit a user's ability to have positive recreational experiences. Adverse effects of implementing a user capacity management system would be primarily associated with the displacement of users who are not willing to participate in voluntary registration systems and who would perceive a mandatory permit system as limiting their right to guaranteed access to public lands.

Alternative 3:

Alternative 3 allows for higher encounter standards (less than 40% of nights) and larger groups sizes (group size limitation of 12), and delays efforts to implement management actions that would address encounter impacts. Allowing higher encounter standards would begin to degrade some recreational experiences, and may result in the displacement of users who are seeking more primitive recreational experiences, particularly in RMZs 1 and 4. With higher encounter standards, use levels on the river would continue to rise until they leveled off at a point where users were being displaced due to overcrowding and encounter impacts exceeding user tolerances. This would have an adverse effect on some user's ability to have positive recreational experiences and the ability for the BLM to meet prescribed setting characteristics. Users who are not seeking primitive recreational experiences would be more likely to use the river corridor, as the experience setting would shift towards more semiprimitive and roaded natural recreational experiences.

Alternative 4:

Management actions proposed in Alternative 4 are primarily the same as Alternative 2, except that Alternative 4 prescribes lower encounter standards (less than 10% of nights) and smaller group sizes (group size limitation of 8), and accelerates efforts to implement management actions that would address encounter impacts. The lower encounter standard and smaller group sizes would reduce overall users within the river corridor, resulting in fewer impacts to campsites and less displacement of users who are seeking more primitive recreational experiences when compared to all other alternatives. Adverse effects of implementing a user capacity management system would be primarily associated with the displacement of users who are not willing to participate in voluntary registration systems and who would perceive a mandatory permit system as limiting their right to guaranteed access to public lands.

4.2.6.3 Effects of proposed recreation management decisions regarding litter, human waste, fire rings, and educational/interpretational information on a user's ability to have positive recreational experiences within the DWSR corridor.

Alternative 1 (No Action Alternative):

Under Alternative 1, there is no specific strategy to address the management of litter, human waste, and fire rings. As a result, impacts have continued to increase within the river corridor. The lack of a clearly defined educational and interpretational emphasis has made it difficult to increase educational awareness, resulting in unethical behaviors that have exceeded user tolerances. Campsites with excessive litter, human waste, and multiple fire rings detract from the natural and primitive character of the river corridor, and adversely affect a user's ability to have positive recreational experiences.

Alternative 2 (Proposed Action):

Actions to address litter in Alternative 2 include increased education, additional cleanup patrols, and the requirement to use firepans and the removal of ash and unburned litter. Almost all of the litter found within the river corridor is partially burned material left behind in fire rings, which can be greatly reduced by implementing a firepan requirement. Users will be less likely to burn waste in a firepan, resulting in cleaner campsites and a more positive recreational experience. Increased education and cleanup patrols are methods that are less intrusive and are generally well received by users, while a firepan requirement may displace some users who are not willing to pack out their own litter and ash to other areas that do not have firepan requirements.

Actions to address human waste in Alternative 2 include increased education, requiring commercial guides to use portable toilets, additional cleanup patrols, and a portable toilet requirement as a last resort. Human waste is an issue that has obvious health and safety considerations and a majority of respondents in the 2005 Delta River User Survey rate the presence of human waste and toilet paper as having the greatest impact to their recreational experience. Past monitoring of human waste shows that current levels already exceed user tolerances, resulting in potential health and safety considerations and reducing positive user experiences. Management actions are designed to reduce levels of human waste, all of which would have a beneficial impact to recreational experiences. Increased education and cleanup patrols are generally well received by users, while a portable toilet requirement and the eventual removal of the outhouse at the river portage may displace some users who are not willing to pack out their own wastes to other areas that do not require portable toilets.

Actions to address multiple fire rings in Alternative 2 include dismantling all but one fire ring per site, increased education, and the eventual requirement to use portable firepans. Rock fire rings promote the cutting of larger fuels than would be required with the use of portable firepans, and leave unsightly scars in campsites that are nearly impossible to rehabilitate. Firepans use smaller pieces of wood, resulting in less vegetation damage, ground scarring, blackened rocks, and litter left behind in fire rings. Wildfire potential is higher with rock fire rings than with firepans, since fires must be completely extinguished before packing away the firepan and leaving camp. Increased education and cleanup patrols are generally well received by users, while a firepan requirement may displace some users who are not willing to carry a firepan to other areas that do not have firepan requirements.

The implementation of a well defined educational/interpretational program will have a beneficial effect of increasing educational awareness throughout the river corridor. This will help to reduce unethical behaviors that threaten to exceed user tolerances, and will help to promote a better understanding of the archeological significance and subsistence lifestyle opportunities that are present.

Alternative 3:

Actions to address litter in Alternative 3 are the same as same as Alternative 2, except that firepans would not be required, and educational efforts would be used to reduce impacts. Increased education and cleanup patrols are methods that are less intrusive and are generally well received by users, but if education is not effective, litter would continue to accumulate at campsites, having an adverse effect on recreational experiences.

Actions to address human waste in Alternative 3 emphasize education, but portable toilets would not be required. One outhouse would be added in RMZ 2. This additional outhouse would help to alleviate human waste concerns in RMZ 2, but would not address human waste at other locations in the river corridor. Outhouses are very difficult to maintain and result in additional adverse impacts to vegetation, including trampling, social trails, and satellite sites in the vicinity of the outhouse. Fewer users would be displaced by not having a portable toilet requirement, but if education is not effective, the presence of human waste at river campsites would persist, having an adverse effect on recreational experiences.

Actions to address multiple fire rings in Alternative 3 emphasize education, but do not require the use of firepans, and allow chainsaws and the cutting of standing dead trees. Wildfire potential will be higher with rock fire rings than with firepans, and rock fire rings will lead to increased vegetation damage, ground scarring, blackened rocks, and litter left behind in fire rings. Fire scarring will continue to persist at campsites if education is not effective, and more trees will be cut within the river corridor, leaving stumps that will reduce scenic qualities. Fewer users would be displaced without a firepan requirement, but negative impacts would still occur at campsites, having an adverse effect on recreational experiences.

The effects of implementing a well defined educational/interpretational program are the same as Alternative 2.

Alternative 4:

Methods used to address litter, human waste, and fire rings in Alternative 4 are the same as Alternative 2, except that management actions will occur sooner if monitoring shows that standards are being exceeded. Effects would be the same as Alternative 2. It is likely that more users would be inconvenienced by the requirements for portable toilets and fire pans.

The effects of implementing a well defined educational/interpretational program are the same as Alternative 2, except that interpretive displays would not be installed on nonmotorized trails. This would have a beneficial effect of creating the most primitive and pristine environment, but users would not be able to gain an awareness and understanding of archaeological resources in the area.

4.2.6.4 Effects of proposed BBM decisions on preserving a diversity of recreational experiences within the DWSR corridor.

Alternative 1 (No Action Alternative):

The absence of BBM recreation decisions in Alternative 1 does not satisfy current BLM recreational planning requirements. Without these decisions, a diversity of recreational experiences for all visitors may not be achieved. Alternative 1 would likely lead to higher use levels and greater visitor impacts than the other alternatives, adversely impacting primitive and semiprimitive experiences, especially in RMZs 1 and 4. OHV use is likely to increase on unauthorized OHV trails, leading to conflicts between motorized and nonmotorized users. Motorized boating will continue to reach relatively inaccessible areas, especially during high water events, or if new motorized watercraft technology allows for travel in shallow water conditions. Without formalized designations of motorized and nonmotorized areas, social conflicts are likely to increase.

Alternatives 2 (Proposed Action), 3 and 4:

Alternatives 2, 3 and 4 would maintain a diversity of recreational experiences in the Delta River SRMA by implementing the proposed BBM decisions and creating five distinct RMZs. The creation of RMZs helps to ensure that specific activities, experiences and benefits are targeted for management and that specific ROS classes are applied to each RMZ, providing for a diversity of available experience settings including primitive, semiprimitive nonmotorized, semiprimitive motorized and roaded natural settings. Without the designation of RMZs, there is nothing to guide management activities towards beneficial outcomes, and user conflicts will continue to persist, eventually leading to user displacement due to the loss of recreational diversity.

4.2.6.5 Effects to recreation resources from identifying ORVs.

Alternative 1 (No Action Alternative):

Alternative 1 would not establish ORVs for the DWSR corridor. The failure to identify ORVs for the DWSR in ANILCA makes it impossible to protect and enhance the ORVs that were the original basis for designation. The protection and enhancement of ORVs is one of the primary goals of Section 1(b) of the WSRA. Furthermore, additional protections provided in Section 7 of the WSRA would not be available for future projects within the bed and the banks of the river. This would have an overall adverse effect on recreation resources.

Alternatives 2 (Proposed Action), 3 and 4:

Proposing Recreation as an ORV throughout all river classification segments will be beneficial by ensuring that recreational management is based on clearly defined objectives; providing a foundation for future planning, management, and monitoring of recreational activities within the DWSR corridor. Management objectives will seek to provide a diversity of recreational experiences, while preserving the river in its immediate, natural environment. Protections provided by the WSRA will ensure that ORVs are maintained and enhanced for future generations.

4.2.7 Scenic Resources

4.2.7.1 Effects of the proposed recreational facility developments on scenic resources.

All Alternatives:

Under all alternatives, the Tangle Lakes Campground will be renovated to address resource impacts to soils and vegetation and to meet the current demand of recreational use. Designated campsites and camping facilities will be located throughout the campground in a manner conforming to Class I VRM standards, described in Chapter 3. Areas with impacted vegetation and soils will be revegetated, campsites and gravel travel routes will be defined for vehicular travel, and facilities will harmonize with the surrounding environment. All of these actions will benefit scenic resources.

Alternative 1 (No Action Alternative):

Alternative 1 would not establish group size limitations or river campsite management objectives, and the potential would be high for unmanaged river campsites to grow, increasing bare ground disturbance and riverbank erosion. Heavy use sights with substantial riverbank erosion can detract from scenic qualities due to the visibility of impacts from the river.

Alternative 2 (Proposed Action):

Under Alternative 2, actions identified for river campsite management and a group size limitation (10) would reduce the potential for light and moderate impacted sites to become heavy impacted sites, and would provide actions to reduce riverbank erosion, benefitting scenic resources. The potential for impacts to scenic resources would be less than Alternative 3, but slightly higher than Alternative 4, due to differences in campsite management actions and a larger group size limitation in this alternative.

Alternative 3:

Alternative 3 would also identify management actions for river campsite management and group size limitations, but the group size would be larger (12) and campsite management actions would allow for the creation of additional campsites. Existing heavy and moderate impact sites would be hardened and expanded to accommodate larger groups and increased use. Light and moderate impact sites may develop into heavy impact sites, adversely affecting scenic resources. One additional outhouse in RMZ 2 is proposed. This outhouse could be located out of sight of the river; however, secondary effects of outhouses include increased use adjacent to the outhouse, with associated impacts resulting in ground

compaction, social trails and satellite sites, and vegetation trampling. These secondary effects are highly visible and would adversely impact scenic resources.

Alternative 4:

Under Alternative 4, actions identified for river campsite management and a smaller group size limitation (8) would minimize the potential for light and moderate impacted sites to become heavy impacted sites, and would provide actions to reduce riverbank erosion. Elimination of the outhouse at the river portage and associated visual impacts (bare ground, trampled vegetation, social trails), combined with the potential for the rehabilitation or closure of heavy use campsites, would have a beneficial effect on scenic resources. The elimination of all river signage, boater registration kiosk, and river survey boxes would enhance scenic resources along the river, resulting in a more primitive viewshed, but would also have the adverse effect of reducing the collection of important visitor use information and visitor safety with the removal of river warning signs.

4.2.7.2 Effects of travel management decisions on scenic resources.

Alternative 1 (No Action Alternative):

Under Alternative 1, the only designated OHV trails within the river corridor are the Top of the World and Rainy Creek Trails. All other OHV trails existing within the river corridor are unauthorized. The unauthorized proliferation of OHV trails has the potential to adversely impact scenic resources because trail braiding results in large areas of erosion and vegetation disturbance that was not present before these trails were pioneered, particularly on hillsides where trails access the river. In addition, the absence of designated nonmotorized trails has resulted in numerous user-created hiking trails adjacent to the developed facilities. Rather than having defined, designated nonmotorized trails that tend to concentrate use to one particular area, the current situation of spur trails accessing many of the ridges within the viewshed has resulted in adverse impacts to scenic resources.

Alternatives 2 (Proposed Action) and 4:

Alternatives 2 and 4 propose the closure and rehabilitation of four unauthorized OHV trails. This will benefit scenic resources by protecting the viewshed from further visual impacts, while allowing these unauthorized trails to rehabilitate to their natural condition. Limiting OHV use to designated trails would preserve existing OHV access, while ensuring that trails are located in appropriate, sustainable locations to minimize damage to scenic resources. A GVW restriction of 2000 lbs. would reduce potential impacts to scenic resources, as soil compaction and the shear forces caused by larger OHVs can alter hydrologic patterns and increase erosion and sedimentation. This alternative reduces the potential for stream destabilization, riparian habitat degradation, and a reduction in erosion and sedimentation from OHV use, benefiting scenic resources. The designation of nonmotorized trails will concentrate use to established trails that are designed in a sustainable manner, with consideration for protecting scenic resources. Trail spurs will be closed and rehabilitated, improving overall scenic qualities within the viewshed.

Alternative 3:

Alternative 3 provides increased opportunities for OHV use by designating four additional OHV trails, not establishing GVW restrictions, and allowing travel off of designated trails for game retrieval. These actions would adversely affect scenic resources by creating additional impacts commonly associated with OHV use, such as trail scarring, rutting, and braiding, altering the scenic viewshed. The designation of nonmotorized trails will benefit scenic resources by concentrating use to established trails that are designed in a sustainable manner, with consideration for protecting scenic resources. Trail spurs will be closed and rehabilitated, improving overall scenic qualities within the viewshed.

4.2.7.3 Effects to scenic resources from identifying ORVs.

Alternative 1 (No Action Alternative):

Alternative 1 would not establish ORVs for the DWSR corridor. The failure to identify ORVs for the DWSR in ANILCA makes it impossible to protect and enhance the ORVs that were the original basis for

designation. The protection and enhancement of ORVs is one of the primary goals of Section 1(b) of the WSRA. Furthermore, additional protections provided in Section 7 of the WSRA would not be available for future projects within the bed and the banks of the river. This would have an overall adverse effect on scenic resources.

Alternatives 2 (Proposed Action), 3 and 4:

The effects of proposing Scenic Resources as an ORV in all river classification segments will be beneficial by ensuring that scenic values are considered in future proposed developments within and adjacent to the river corridor. Potential effects would be mitigated through the implementation of management objectives prescribed for VRM Class I lands and other VRM design criteria, as well as the purpose and intent of the WSRA. Site specific NEPA analysis would address the potential effects to the scenic resources ORV when a proposed development actually occurs. Protections provided by the WSRA will ensure that the Scenic Resources ORV is maintained and enhanced for future generations.

4.2.8 Soil Resources

4.2.8.1 Effects of OHV management decisions on soil resources.

Alternative 1 (No Action Alternative):

Under Alternative 1, the only designated OHV trails within the river corridor are the Top of the World and Rainy Creek Trails. All other OHV trails within the river corridor are unauthorized. Unauthorized OHV trails have a high potential to adversely impact soil resources as a result of erosion, sedimentation, and compaction. The most serious and permanent impact from OHVs is soil erosion, with water being the primary displacement mechanism. While soil compaction may recover to some degree during periods of non-use, erosion usually continues once started. Most OHVs have powerful motors and deeply treaded tires. When the tires spin they displace large amounts of soil quickly, removing vegetation and soils that can create or accelerating rutting. This is especially evident on steep slopes and wetland crossings. The displaced soil often finds its way into waterways, resulting in increased turbidity and sedimentation. This can negatively impact water quality and numerous aquatic organisms. Alternative 1 does not formally identify and rehabilitate unauthorized OHV trails, and consequently, would adversely impact soil resources.

Alternatives 2 (Proposed Action) and 4:

Alternatives 2 and 4 propose the closure of four unauthorized OHV trails, OHV limitations of 2000 lbs. GVW, and the requirement to stay on designated OHV trails. Limiting OHV use to designated trails would preserve existing OHV access and would ensure that trails are located in appropriate, sustainable locations to minimize damage to soil resources. A GVW restriction of 2000 lbs. would reduce potential impacts to soil resources, as soil compaction and the shear forces caused by larger OHVs can create mud holes that alter hydrologic patterns and increase erosion and sedimentation. Adverse impacts to soils under this alternative would be less than under Alternatives 1 and 3.

Alternative 3

Alternative 3 provides increased opportunities for OHV use by designating four additional OHV trails, not establishing GVW limitations, and allowing travel off of designated trails for game retrieval. Effects to soils would be the same as Alternative 1. Since there would be more trails open to OHV use, it is anticipated there would be the greatest adverse impacts to soils under this alternative.

4.2.8.2 Effects of campsite management decisions on soil resources.

Alternative 1 (No Action Alternative):

Alternative 1 would not establish group size limitations or river campsite management actions, and the potential would be high for unmanaged river campsites to grow larger. This would increase soil compaction within campsites and riverbank erosion, adversely affecting soil resources.

Alternative 2 (Proposed Action):

Under Alternative 2, actions identified for river campsite management and a group size limitation (10) would minimize the potential for light and moderate impacted sites to become heavy impacted sites, and would provide actions to reduce riverbank erosion, bare ground disturbance and soil compaction. The potential for adverse impacts to soil resources would be less than Alternative 3, but slightly higher than Alternative 4, due to differences in campsite management actions (creation of additional campsites) and a larger group size limitation in this alternative.

Alternative 3:

Alternative 3 would also identify actions for river campsite management and a group size limitation, but the group size would be larger (12) and campsite management actions would allow for the creation of additional campsites. Existing heavy and moderate impact sites would be hardened and expanded to accommodate larger groups and increased use. Light and moderate impact sites may develop into heavy impact sites, leading to increased adverse soil impacts including bare ground disturbance, soil compaction, and trampling as a result of larger groups and additional campsites.

Alternative 4:

Under Alternative 4, actions identified for river campsite management and a smaller group size limitation (8) would minimize the potential for light and moderate impacted sites to become heavy impacted sites, and would provide actions to reduce riverbank erosion, bare ground disturbance and soil compaction. Additional campsites would not be created under this alternative, and associated soil impacts (bare ground, compaction, and trampling), combined with the potential for rehabilitation or closure of heavy use campsites, would have a beneficial effect on soil resources.

4.2.9 Subsistence

4.2.9.1 Effects of the proposed recreation management decisions to subsistence use of fish and wildlife in the DWSR corridor.

Subsistence use of fish and wildlife is a protected activity within the DWSR corridor (ANILCA Title VIII, 50 CFR §100.3.c). The BLM Glennallen Field Office has delegated authorities to implement regulations and manage permits for subsistence uses within the DWSR corridor. BLM is required by ANILCA Title VIII, Section 810 to consider any potential impacts to subsistence activities, resources, or impacts to access for subsistence activities from the alternatives. These impacts are discussed in a Section 810 Evaluation Report. The complete Section 810 Evaluation for this plan can be found in Appendix 7.3.

4.2.10 Travel Management

4.2.10.1 Effects of travel management decisions on the natural and primitive character of the DWSR corridor and on preserving a diversity of recreational experiences.

All Alternatives:

Management regarding the use of pack animals, mountain bikes (mechanized travel), snowmachines, and dog mushing will not change in any of the alternatives. These uses rarely occur within the river corridor and current impacts are low, offset by the positive benefit of maintaining a diversity of recreational experiences. If the use of snowmachines, mechanized travel, pack animals or dog mushing becomes a natural resource or social conflict problem, these uses may be limited through site specific trail restrictions developed in the future.

Alternative 1 (No Action Alternative):

Under Alternative 1, the continuation of current OHV management practices would have adverse impacts to natural and primitive character. Trail braiding, erosion, and vegetation damage is occurring on the Top

of the World Trail and at the confluence of Eureka Creek and leads to evidence of human use that is inconsistent with the primitive character of the river corridor.

Motorized boating is limited by the existing BLM recommendation of 15 horsepower motors on the Tangle Lakes. Otherwise, motorized boating in the DWSR corridor is only limited by natural barriers in the river. Technological advancements in motorized watercraft during the life of the plan may lead to increased access in areas that are currently limited by shallow water and natural barriers. This alternative does not regulate motorized boating use, leading to increasing social conflict issues and adversely affecting the opportunity for a diversity of recreational experiences.

Airplane landings within the river corridor occasionally occur on some of the larger lakes and are primarily associated with the transportation of hunters and fisherman. Noise caused by airplane landings may adversely affect some users seeking solitude and natural quiet, and those expecting a nonmotorized experience may be disrupted by airplane landings. Airplane landings rarely occur in the narrow river channel since there are few areas suitable for airplane landings.

Travel by foot has potential impacts to vegetation and soils, occurring primarily in pristine areas when groups do not spread out and disperse, and when social trails develop within and around river campsites. These adverse impacts have occurred on hillsides adjacent to the developed facilities and at river campsites throughout the river corridor. Impacts to vegetation and soils include erosion, increased sedimentation, and trail scarring, adversely affecting natural and primitive character.

Alternative 2 (Proposed Action):

Alternative 2 will limit the use of OHVs to two designated trails (Top of the World and Rainy Creek Trails), except during periods of adequate snow cover or ground frost. Alternative 2 proposes the closure of four unauthorized OHV trails, OHV limitations of 2000 lbs. GVW, and the requirement to stay on designated OHV trails. Exceptions to the GVW restriction may be granted to access active mining claims via the Rainy Creek Trail and for subsistence access with authorization from BLM. Limiting OHV use to designated trails will help prevent unauthorized trails while maintaining existing traditional access routes for recreational and subsistence users, resulting in less adverse impacts to the surrounding primitive and natural character. The 2000 lb. GVW limitation is unlikely to affect recreational or subsistence users since vehicles larger than 2000 lbs. GVW have rarely been observed within the river corridor.

Alternative 2 proposes to seasonally limit the use of motorized boats and airplane landings in RMZs 1 and 4. Subsistence users and those seeking access for traditional activities (described in ANILCA Sections 811 and 1110) would be able to use motorized boats and land airplanes during the seasonal closure with prior authorization. The seasonal limitation would help to maintain the natural and primitive character found within these RMZs, and would provide additional opportunities for solitude and a greater diversity of recreational experiences. Users seeking a nonmotorized experience would be able to rely on having two separate areas within the DNWSR corridor during June and July to realize these expectations. This would have an overall beneficial effect on preserving a diversity of recreational experiences. Seasonal limits on motorized boating and airplane landings is unlikely to affect recreational or subsistence users since documented use of motorized boats and airplane landings in RMZs 1 and 4 is very low during June and July. Airplane landings in RMZ 3 have never been observed by BLM due to the lack of suitable landing areas, therefore there would be no effect. The allowance of airplane landings all year in RMZs 2 and 5 will not have adverse effects to recreational users due to the close proximity of the Denali and Richardson Highways and developed facilities. Users seeking solitude and natural quiet are less likely to be displaced due to associated noise and flight activity in areas where this is the general expectation.

Alternative 2 will manage foot travel by designating four nonmotorized trails. Formal, maintained hiking trails will provide sustainable routes of travel, with easy access from the Denali Highway and developed facilities. Duplicate and parallel routes will be reduced, enhancing the natural and primitive character of the river corridor. Possible adverse effects from the designation of nonmotorized trails may include increased use levels in these areas, reducing the remote nature and sense of adventure for some people if use levels exceed their expectations. Social trails associated with designated river campsites will be monitored and management actions will help to limit the proliferation of additional social trails at river campsites, having a beneficial effect on natural character and primitive recreational experiences.

Alternative 3:

Alternative 3 will designate four OHV trails. OHVs would be allowed to travel off designated trails for game retrieval, and there would be no GVW limit on OHV use. Allowing OHV use on more trails would adversely impact natural and primitive character through increased trail activity.

Alternative 3 does not restrict motorized boating use. Unlimited motorized boating throughout the river corridor will impact the natural and primitive character of the river corridor. Nonmotorized boaters seeking natural quiet and solitude will become displaced, and the available diversity in recreational experiences will be less than Alternatives 2 and 4.

Under Alternative 3, airplane landings will not be restricted This will have an adverse effect on users seeking solitude, natural quiet, and nonmotorized primitive experiences and will reduce the diversity of recreational experiences within the river corridor.

Effects caused by foot travel will be the same as Alternative 2, except that social trails associated with designated river campsites would increase because management actions to limit social trail development would not be implemented unless resource damage is occurring. This would lead to increased adverse impacts to natural and primitive character when compared to Alternatives 2 and 4.

Alternative 4:

OHV proposals in Alternative 4 are the same as Alternative 2, except that OHV users would be required to park out of sight of the river. This would maintain a more primitive experience along the lower river corridor, benefiting nonmotorized users who are seeking solitude and wilderness characteristics. Adverse effects would include the potential for increased impacts to vegetation and soils where OHVs would be required to park off the trail, particularly in designated river campsites.

Alternative 4 proposes the greatest restrictions on motorized boating within all RMZs by limiting certain types of uses altogether, and by establishing seasonal limitations and horsepower restrictions. Some motorized boaters would feel excluded from the ability to have any positive recreational experiences because of motorized boating restrictions proposed under this alternative. Conversely, other motorized boaters might feel that the quality of their experience would improve because of the elimination of airboats, hovercraft, and jetskis, and through additional horsepower restrictions. Nonmotorized boaters would realize their full expectations regarding natural quiet and solitude in RMZs 1 and 4.

Prohibiting airplane landings for both recreational and subsistence purposes will limit the ability to access these areas, particularly during hunting season. This would result in a loss of recreational diversity within the DWSR corridor. Users seeking natural quiet, solitude, and a nonmotorized primitive experience would fully realize their expectations with regards to airplane landings within the river corridor. Airplane landings in RMZ 3 have never been observed by BLM due to the lack of suitable landing areas, therefore there would be no effect.

Alternative 4 proposes the designation of only one nonmotorized trail. This would help to maintain a more primitive experience, benefiting users who are seeking solitude and remoteness, but the overall footprint of trail impact areas would increase as use levels increase, adversely affecting natural and primitive character. Effects from the management of social trails in designated river campsites would be the same as Alternative 2.

4.2.11 Vegetation

4.2.11.1 Effects of OHV management decisions on vegetative resources.

Alternative 1 (No Action Alternative):

In Alternative 1, the only designated OHV trails within the river corridor are the Top of the World and Rainy Creek Trails. All other OHV trails within the river corridor are unauthorized. The use of OHVs on unauthorized trails can adversely impact pristine upland and riparian vegetation. Impacts may include

crushing, breaking, and trampling of vegetation, reducing the capacity to naturally regenerate, increased soil compaction that will stress plants and associated roots, resulting in impaired growth and/or die back. Erosion, especially on steep slopes, can prevent the natural reestablishment of vegetation. OHV use on unauthorized trails can also disturb natural conditions in soils and vegetation, facilitating the introduction and spread of noxious weeds. OHVs not only create the disturbance conditions favoring the introduction of non-native invasive weeds, they also act as a vector to carry and spread the weed seeds themselves.

Alternatives 2 (Proposed Action) and 4:

Alternatives 2 and 4 propose the closure of four unauthorized OHV trails, which will protect vegetative resources from additional adverse impacts, while allowing these unauthorized trails to rehabilitate to their natural condition. OHV limitations of 2000 lbs. GVW and the requirement to stay on designated OHV trails will further limit adverse impacts to vegetation and potentially reduce the spread of invasive weeds.

Alternative 3:

Alternative 3 provides increased opportunities for OHV use by designating four additional OHV trails, not establishing GVW limitations, and allowing travel off designated trails for game retrieval. Effects to vegetation would be the similar to Alternative 1. This alternative would result in the continued proliferation of unauthorized OHV trails, and have the highest potential for the spread of invasive weeds. Since there would be more trails open to OHV use, it is anticipated there would be the greatest adverse impacts to vegetation under this alternative.

4.2.11.2 Effects of campsite management decisions on vegetative resources.

Alternative 1 (No Action Alternative):

Alternative 1 would not establish group size limitations or river campsite management objectives, leading to increases in unmanaged river campsites, resulting in adverse impacts to vegetative resources. Impacts may include crushing, breaking, and trampling of vegetation, reducing the capacity to naturally regenerate, as well as increased soil compaction that will stress plants and associated roots, resulting in impaired growth and/or die back.

Alternative 2 (Proposed Action):

Under Alternative 2, actions identified for river campsite management and a group size limitation (10) would minimize the potential for light and moderate impacted sites to become heavy impacted sites, and would provide actions to reduce adverse impacts to vegetation described in Alternative 1. The potential for impacts to vegetation would be less than Alternative 3, but slightly higher than Alternative 4, due to differences in campsite management actions (creation of additional campsites) and a larger group size limitation in this alternative.

Alternative 3:

Alternative 3 would also identify management actions for dispersed river campsites and a group size limitation, but the group size would be larger (12) and campsite management actions would allow for the creation of additional campsites. Existing heavy and moderate impact sites would be hardened and expanded to accommodate larger groups and increased use. Light and moderate impact sites may develop into heavy impact sites, leading to increased adverse vegetation impacts (described in Alternative 1) as a result of larger groups and the creation of additional campsites.

Alternative 4:

Under Alternative 4, actions identified for dispersed river campsite management and a smaller group size limitation (8) would minimize the potential for light and moderate impacted sites to become heavy impacted sites, and would provide actions to reduce adverse impacts to vegetation described in Alternative 1. Additional campsites would not be created under this alternative, and associated vegetation impacts (bare ground, compaction, and trampling), combined with the potential for

rehabilitation or closure of heavy use campsites, would have a beneficial effect. This alternative would have the least adverse impacts to vegetative resources of all alternatives.

4.2.11.3 Effects of decisions regarding the use of firewood gathering on vegetative resources.

Alternatives 1 (No Action Alternative) and 3:

Alternatives 1 and 3 contain no actions to manage the use of vegetative resources for campsite firewood. The cutting of standing dead trees and the use of chainsaws would continue to be permitted, leading to a continued increase in number of tree stumps and a gradual reduction of vegetative cover immediately adjacent to river campsites.

Alternatives 2 (Proposed Action) and 4:

Alternatives 2 and 4 would require the use of only dead and down trees for campsite fires and the use of chainsaws would be prohibited for campsite firewood. This would likely reduce the number of visible tree stumps adjacent to river campsites, reduce adverse effects to natural quiet, and maintain the vegetative cover immediately adjacent to river campsites.

4.2.12 Water Quality

4.2.12.1 Effects to water quality from potential contaminants as a result of motorized boating and human waste disposal decisions.

Alternative 1 (No Action Alternative):

Under Alternative 1, motorized boating would only be limited by natural constraints within the river (rock gardens, low water, narrow and shallow channels), and by the current BLM recommendation of a 15 horsepower limitation on the Tangle Lakes. In terms of water quality (potential for petroleum hydrocarbons to be released into the water), this alternative would likely produce similar motorized boating use levels and hydrocarbon levels as Alternative 3, although it would produce slightly higher use levels and hydrocarbon outputs than Alternatives 2 and 4, especially in RMZs 1 and 4. Given the current levels of motorized boating, Alternative 1 would not likely result in adverse impacts to water quality from motorized boating use. However, if motorized boating increases substantially during the life of the plan, measurable levels of petroleum hydrocarbons could be expected on peak days. Human waste impacts would be largest under Alternative 1. Use increases are likely to be slightly higher than all other alternatives due to the absence of user capacity limitations and group size limitations. The potential for increased human waste and associated water quality impacts (presence of fecal coliform) is higher, although still expected to remain within state water quality standards.

Alternative 2 (Proposed Action):

Alternative 2 proposes to seasonally limit the use of motorized boats within RMZs 1 and 4, benefitting water quality in the Upper Tangles and in the clear water portions of the DWSR, where the concentration of arctic grayling is at record densities. Compared to the other alternatives, petroleum hydrocarbons released into the water and associated adverse effects would be less under this alternative than Alternatives 1 and 3, but slightly more than Alternative 4. Alternative 2 would set standards for human waste management at designated campsites, based on user tolerances. When standards are exceeded, management actions would be implemented, including increased education, requiring guides to carry portable toilets, and ultimately requiring all users to carry portable toilets. Beneficial effects of this proposal would be a decrease in the amount of improperly disposed human waste. Consequently, the potential for human waste (fecal coliform) to enter the river and adversely affect water quality would decrease, thereby benefitting water quality.

Alternative 3:

Under Alternative 3, unlimited motorized boating would have the same effects to water quality described for Alternative 1. Alternative 3 would also set standards for human waste management at designated

campsites, but does not require river users to utilize portable toilet systems if standards are being exceeded. In addition to one existing outhouse, another outhouse would be installed in RMZ 2. Given these actions, the occurrence of improperly disposed human waste on the river would be higher than Alternatives 2 and 4, especially in areas without any outhouses.

Alternative 4:

Alternative 4 proposes the greatest restrictions on motorized boating by limiting certain types of uses altogether, and by establishing seasonal limitations and horsepower restrictions. As a result, petroleum hydrocarbons released into the water would be less under this alternative than all other alternatives, having the least potential to adversely affect water quality. Effects of human waste disposal are generally the same as Alternative 2, except that portable toilets would be required sooner if standards are exceeded. Relatively, the potential for adverse effects to water quality resulting from contaminants would be less under this alternative than all other action alternatives.

4.2.12.2 Effects to water quality from potential sedimentation sources including designated campsites, OHV trails and OHV river crossings.

Alternative 1 (No Action Alternative):

Erosion and sedimentation contributions from campsites would be greatest under this alternative (which has no substantial management actions to limit those impacts). In addition, OHV crossings would continue to proliferate, with substantial potential for point source sedimentation during runoff or heavy rainfall. These sediment sources could adversely impact water quality, at least in localized parts of the river (e.g. Top of the World Trail river crossing).

Alternative 2 (Proposed Action):

Alternative 2 manages campsites based on levels of impact at campsites. Over time, these management actions would help to prevent active erosion and sedimentation into the river caused by bank trampling, benefiting water quality. This alternative develops a management strategy for OHV trails and OHV river crossings. Crossings would be permitted based on the location of the crossing in a “hardened” area that would help to minimize sedimentation. The requirement for OHVs to stay on designated trails and a 2000 lb. GVW limitation would help to minimize unauthorized trail development and the potential for sedimentation from poorly located trails and larger vehicles accessing the river column. Unauthorized trails would be closed and allowed to revegetate. These actions would help to reduce sedimentation into the river, thereby benefiting water quality.

Alternative 3:

Alternative 3 prescribes campsite management actions that would allow for the creation of additional campsites and the proposed group size limit is larger (12) than Alternatives 2 and 4. Existing heavy and moderate impact sites would be hardened and expanded to accommodate larger groups and increased use. These actions would result in a higher potential for bank trampling and point source sedimentation, thereby increasing potential adverse effects to water quality. Four additional trails in the DWSR corridor would be open for OHV use, with no GVW restrictions and an allowance to travel off designated trails for game retrieval. Under this alternative, it is likely that unauthorized trail proliferation would continue to occur, including unauthorized river crossings, with a high potential for point source sedimentation during runoff or heavy rainfall. The absence of GVW restrictions would allow larger vehicles to cross through the clear water river corridor, increasing sedimentation. These sediment sources would have a high potential to adversely impact water quality.

Alternative 4:

Alternative 4 prescribes many of the same campsite rehabilitation measures as Alternative 2, except that some heavy use sites would potentially be closed, and group sizes would be smaller (8). Closure of heavy use sites and smaller group sizes would minimize sedimentation caused by bank trampling. These actions would help to reduce sedimentation into the river, thereby benefiting water quality. Effects related to OHVs would be the same as Alternative 2.

4.2.13 Wilderness Characteristics

4.2.13.1 Effects of management actions on wilderness characteristics, including naturalness, solitude, and primitive and unconfined recreational opportunities that are found within the DWSR corridor.

Alternative 1 (No Action Alternative):

Under Alternative 1, visitor use within the river corridor would be allowed to increase without any user capacity limitations. Increased visitor use would lead to additional resource impacts including vegetation trampling, bare ground disturbance, social trails, and satellite sites, adversely impacting naturalness. Social conflicts related to increased visitor use would persist, especially between motorized and nonmotorized users, and opportunities for solitude and primitive and unconfined recreational experiences would decrease as visitor use increases over time.

Alternative 2 (Proposed Action):

The proposed management actions in Alternative 2 would seek to preserve two specific areas within the DWSR corridor that would be seasonally managed for a primitive and semiprimitive nonmotorized experience. RMZs 1 and 4 currently provide the best opportunities for wilderness characteristics, and a seasonal closure during June and July to motorized boating and airplane landings would help to preserve specific time frames when users would be able to expect this type of experience. The remaining RMZs would be managed for different activities, experiences, and benefits, providing a greater diversity of recreational experiences. Both motorized and nonmotorized users would have specific areas targeted for these different opportunities, reducing social conflicts associated with this classic user conflict pattern.

Alternative 3:

Under Alternative 3, the adverse effects to wilderness characteristics are the greatest, due primarily to the absence of motorized boating and airplane landing limitations within RMZs 1 and 4 and the designation of four additional OHV trails. Unrestricted motorized boating and airplane landings would adversely affect opportunities for solitude and unconfined recreational experiences. Users who are seeking areas with wilderness characteristics would be displaced to other areas.

Alternative 4:

Alternative 4 would provide the most beneficial effects to wilderness characteristics. Motorized boating, airplane landings, and OHV limitations are the most restrictive in Alternative 4; consequently, Alternative 4 would preserve more opportunities for solitude and primitive and unconfined recreational experiences when compared to all other alternatives.

4.2.14 Wildlife

4.2.14.1 Effects of OHV travel management decisions to moose and caribou.

Alternative 1 (No Action Alternative):

Under Alternative 1, OHVs would still be allowed to travel off designated trails for game retrieval. As a result, unauthorized trail proliferation would continue, resulting in potential habitat fragmentation for moose and caribou. At current use levels this impact is negligible, but may increase with additional OHV use on unauthorized trails.

Alternatives 2 (Proposed Action) and 4:

Under Alternatives 2 and 4, four unauthorized OHV trails will be closed and OHVs will not be allowed to travel off designated trails for game retrieval, except during periods of adequate snow cover. The closure of unauthorized trails and the requirement to stay on designated trails may reduce potential

habitat fragmentation in RMZs 4 and 5. In the TLAD, where RMZs 1, 2, 3, and portions of 4 are located, OHVs are already limited to designated trails due to archaeological resource impacts. Within these RMZs, there are no designated OHV trails, and impacts to moose and caribou will have no effect.

Alternative 3:

Under Alternative 3, four additional trails would be designated for OHV use and OHVs would be allowed to travel off designated trails for game retrieval. Under this alternative, unauthorized trail proliferation would continue, increasing the potential for habitat fragmentation. At current use levels this impact is negligible, but may increase with additional OHV use on unauthorized trails.

4.2.14.2 Effects of motorized boating and airplane landing decisions to land birds and waterfowl.

Alternatives 1 (No Action Alternative) and 3:

In general, research has shown the potential for prolonged disturbances to adversely impact nesting or fledgling success of a variety of land birds. Waterfowl and land birds are susceptible to disturbances from human activity, and prolonged disturbance can lead to nest abandonment. The DWSR corridor provides excellent nesting habitat, especially in RMZs 1 and 4 because of the abundance of small lakes, emergent vegetation and low visitor use levels. Bald eagle nest monitoring shows a stable trend in nesting sites throughout the DWSR watershed. Trumpeter swans, considered a sensitive species by BLM, and other waterfowl are known to nest in the Tangle Lakes area. Current disturbance levels from motorized boating and airplane landings may not have adverse effects on these birds. However, population increase, technological advancements, economic pressure, and other societal changes may result in increased river use. Increased motorized boating and airplane landings use may elevate adverse impacts to land birds and waterfowl. Because Alternatives 1 and 3 have no limitations on motorized boating and airplane landings, the potential exists for increased disturbance to nesting waterfowl and land birds with increased human visitation, especially in RMZ 1 in the Upper Tangles where large concentrations of waterfowl and trumpeter swans are known to nest.

Alternative 2 (Proposed Action):

Alternative 2 would potentially benefit nesting land birds and waterfowl by seasonally limiting motorized boating and airplane landings in RMZs 1 and 4 during June and July. Within these RMZs, trumpeter swans and waterfowl are known to nest, and motorized boating and airplane landing restrictions during this time of year may help to lessen potential disturbances to young chicks as they emerge from the nest.

Alternative 4:

Alternative 4 proposes the greatest restrictions on motorized boating and airplane landings by limiting certain types of uses altogether, and by establishing seasonal limitations and horsepower restrictions on these activities. Consequently, Alternative 4 would do the most to reduce potential disturbances to land bird and waterfowl nesting activity when compared to all other alternatives.

4.2.14.3 Effects of recreation management decisions on human and bear interactions.

Alternative 1 (No Action Alternative):

Relationships between visitor use levels and human-bear encounters are unknown, but may exist. Unmanaged increases in visitor use under Alternative 1 have the potential for increased human-bear encounters.

Alternative 2 (Proposed Action):

Alternative 2 would implement proactive measures to decrease human-bear encounters by emphasizing education (Leave No Trace, bear safety) and awareness. This alternative also proposes potential use

limits; consequently, an upper limit of people on the river and more education would decrease the probability of negative human-bear encounters.

Alternative 3

Alternative 3 also emphasizes increased education, but this beneficial effect could be offset by the potential for increased recreational users on the river and larger group sizes, thus slightly increasing the likelihood of adverse human-bear encounters.

Alternative 4

Under Alternative 4, education regarding minimum impact camping and bear safety would be similar to Alternative 2; however, through the potential limitation of total users on the river and smaller group sizes, the probability for negative human-bear encounters would be slightly less than all other alternatives.

4.2.14.4 Effects to wildlife resources from identifying ORVs.

Alternative 1 (No Action Alternative):

Alternative 1 would not establish ORVs for the DWSR corridor. The failure to identify ORVs for the DWSR in ANILCA makes it impossible to protect and enhance the ORVs that were the original basis for designation. The protection and enhancement of ORVs is one of the primary goals of Section 1(b) of the WSRA. Furthermore, additional protections provided in Section 7 of the WSRA would not be available for future projects within the bed and the banks of the river. This would have an overall adverse effect on wildlife resources.

Alternatives 2 (Proposed Action), 3 and 4:

Wildlife is an important part of the river's ecosystem. Adopting wildlife as an ORV for *Scenic* river classification segment will provide focused management and protection of the river's immediate environments, and will positively impact wildlife resources because of the added protections provided by the WSRA.

4.3 Cumulative Impacts

Cumulative impacts result from individually minor, but collectively significant actions over time, and occur when there are multiple effects on the same values. These are incremental effects of the alternatives when combined with past, present, and future actions, regardless of what agency or person undertakes such other actions.

4.3.1 Cumulative Impact Area (CIA) and Reasonably Foreseeable Future Actions (RFFA)

In order to analyze cumulative effects, the geographic and temporal scope of the cumulative effects analysis must be defined, and is referred to as the Cumulative Impact Area (CIA). For this planning process, the CIA considers reasonably foreseeable future actions and potential future effects. The geographic scope of the analysis includes the DWSR corridor and adjacent lands where reasonably foreseeable future actions (RFFAs) may occur in the future, and where direct and indirect effects, combined with the effects of RFFAs, have the potential to create cumulative effects. RFFAs consist of projects, actions, or developments that can be projected, with a reasonable degree of confidence, to occur in the future that may affect the issues and resources previously evaluated for direct and indirect effects. RFFAs and potential future projects were analyzed in the EARMP. RFFAs identified in the EARMP that apply to the DWSR planning area include:

- Intense exploration focused on deposits of rare metals (nickel and platinum group elements) has occurred in areas north of the Denali Highway and adjacent to the DWSR corridor. Exploration results in this area indicate that it has a high potential for a significant discovery of these metals. Recent conveyance of land ownership to the State of Alaska has allowed for future large scale mining

development; specifically Nevada Star Resource Corporation's MAN Alaska Project, encompassing an area of 280 square miles with exploration underway to locate significant amounts of PGE, nickel, gold, cobalt and copper. If exploration leads to the discovery of an economically developable deposit, the deposit will be developed in a similar manner as the Pogo Mine (about 38 miles northeast of Delta Junction). Surface disturbance will vary depending on mine design, construction of roads, power line corridors, selection of tailing disposal method, and other factors. An order of magnitude estimate would be in the range of 800-1,600 acres. Road building, airstrips, and associated material sites account for the largest surface disturbance followed by mine, mill, tailings disposal site, and camp facilities. While most of these disturbances would occur on State lands adjacent to the DWSR corridor, some road construction or powerlines would be anticipated, placing possible demands for access or right-of-way authorizations across the river corridor.

- The BLM will continue to manage portions of the PLO 5150 Transportation and Utility corridor. Continued maintenance on the TAPS will likely occur within the DWSR corridor. There will likely be increased demand to utilize this corridor for additional utilities or infrastructure to support a natural gas pipeline spur route from Delta Junction to Glennallen.
- Demand for recreational use of public lands will likely increase over the life of the plan. Increases are anticipated for sport fishing, OHV use (including snowmachines), hiking, canoeing/rafting, and highway tourism (bus tours, recreation vehicles). Commercial recreation applications will likely increase.
- Demand for access and use of OHV trails will likely increase. The use of OHVs for recreational purposes will increase while the use of OHVs for hunting and subsistence will remain stable or increase slightly. Changes in OHV design and technology will continue, enabling OHV users to range into areas that were once thought of as inaccessible.

4.3.2 Cumulative Impacts Analysis

The goal of identifying potential cumulative effects is to provide for informed decisions that consider the total effects (direct, indirect, and cumulative) of alternative management actions. This section characterizes the incremental cumulative effects that potentially arise from external factors, in combination with the direct and indirect effects.

4.3.2.1 Cultural Resources

The cumulative actions that most affect cultural resources are related to past and potential future access activities associated with mining development and OHV use, within and adjacent to the DWSR corridor. Current or increased levels of OHV use, combined with potential mining development access, may lead to erosion and soil impacts that would impact both known and unknown archaeological sites. This would reduce the potential to yield information that is significant to our understanding of the region's prehistory, and degrade any eligibility these sites have for the National Register of Historic Places.

In Alternatives 2 and 4, the closure of unauthorized OHV trails that are currently impacting three known archeological sites, combined with the past, present and future actions of mining development access and OHV use, would have the least potential of the alternatives to adversely impact these sites and other unknown archeological sites. This would increase the potential of yielding information significant to our understanding of the region's prehistory and eligibility these sites have for the National Register of Historic Places.

In Alternative 3, the designation of additional OHV trails in areas having known archeological sites, combined with the past, present and future actions of mining development access and OHV use, has more potential than Alternatives 2 and 4 to adversely impact these sites and other unknown archeological sites. This would reduce the potential to yield information significant to our understanding of the region's prehistory and degrade any eligibility these sites have for the National Register of Historic Places.

4.3.2.2 Fisheries

Future activities associated with mineral development may have adverse effects on drainage patterns, water quality, and riparian vegetation, although this would depend upon the location and area of activity. Disturbance and displacement due to mineral development could be long-term. The removal of streamside riparian-wetland vegetation during mining would result in a loss or degradation of aquatic

habitat until proper functioning condition could be reestablished. In general, the time required for riparian-wetland areas to attain proper functioning condition would be dictated by natural processes and may require decades to centuries before it approximates the structure and function of the original aquatic habitat (NCSU 1998; BLM and Montana Dept. of Environ. Quality 1996; BLM 1988).

If road density increases commensurate with mineral development, adverse cumulative impacts may affect fish migration and bedload movement. Bridges, culverts, and low-flow crossings are integral features to road development associated with surface mining. These features can also interfere with stream bedload (substrate) movement, migrations to spawning, feeding, rearing, and overwintering sites if improperly designed. Current concerns related to surface mining and road placement include diverting or eliminating flow from small tributaries that connect lakes and rivers. Fish species that are present in the river that move between these habitat types are vulnerable to impact.

The cumulative impact of unauthorized OHV trails and unrestricted motorized boating activities under Alternatives 1 and 3 may change stream morphology, cause riparian loss or damage, and increase sedimentation into streams. Recreation and travel management actions under Alternatives 1 and 3, combined with past, present, and future actions, may have an overall adverse cumulative effect on fish and fish habitat within the DWSR corridor, although these effects would be localized and unlikely to extend to the regional level. Under Alternatives 2 and 4, OHV use would be limited to designated trails, unauthorized trails would be rehabilitated, and the use of motorized boats would be seasonally limited, contributing to a reduction in cumulative adverse effects to fish habitat through alterations in drainage patterns, degradation of water quality, and riparian loss and/or damage, especially in heavy use areas.

4.3.2.3 Recreation Resources

Future actions that may affect recreation resources include anticipated increases in recreational demand, mineral development, and transportation and utility corridor development projects. All of these reasonably foreseeable future actions have the potential to change recreation settings, recreation access, and availability of recreation resources. Cumulative effects to recreation resources would be greatest under Alternative 1, which does not have any management actions to address recreational impacts. Loss of the area's naturalness from unmanaged recreational impacts, combined with the potential for increased access from the development of transportation and utility corridors, would adversely impact the natural and primitive character of the river corridor.

Alternative 3 allows for higher levels of recreational use and impacts levels than Alternative 2 and 4, and when combined with the potential for increased access from the development of transportation and utility corridors, adverse cumulative effects would be greater than Alternatives 2 and 4, but less than Alternative 1. Alternatives 2 and 4 provide a more restrictive approach to managing levels of recreational use and impact levels, and when considered with past, present and reasonably foreseeable actions, Alternatives 2 and 4 would result in reduced adverse cumulative impacts to recreation resources.

4.3.2.4 Scenic Resources

It is conceivable that additional mining development will occur adjacent to the DWSR corridor in the future, potentially impacting scenic resources with the increased need for transportation and utility corridor development. The past, present and future development of mining and utility transportation networks, combined with current and future impacts from OHV use, may lead to changes in existing scenic resources by altering basic visual elements of form, line, color, and texture at the landscape level. While Alternative 1 does provide mitigation measures to protect scenic resources through the development of Required Operating Procedures for Class I VRM management, it does not directly address the management of unauthorized OHV trails and resulting trail proliferation.

Cumulative impacts to scenic resources as a result of future potential transportation and utility corridor development and increased OHV use will be greatest in Alternatives 1 and 3. Because Alternative 3 provides for the highest number of OHV trails within the planning area, this alternative would have the greatest adverse cumulative impact to scenic resources compared to Alternatives 2 and 4. Alternatives 2 and 4 would not add any additional OHV trails and would close unauthorized OHV trails that are currently impacting scenic resources. Implementing Alternatives 2 or 4 would result in less potential for trail

proliferation, erosion and trail braiding, and when combined with past, present and reasonably foreseeable actions, would result in reduced adverse cumulative impacts to scenic resources.

4.3.2.5 Travel Management

State lands located adjacent to the river corridor are open to OHVs, subject to conditions for generally allowable uses[3]. Restrictions on the use of OHVs in BLM and State of Alaska managed portions of the TLAD have been implemented to protect archeological resources. Although there are OHV restrictions on State and Federal lands in the TLAD, the less restrictive OHV use on State lands adjacent to the river corridor may result in additional OHV related impacts, including unauthorized trail proliferation, soil and vegetation damage, loss of primitive and natural character and introduction and establishment of invasive plants within the adjacent river corridor. Reasonably foreseeable future actions associated with transportation and utility corridor development for mining activities, combined with expected increases in OHV use, would compound and expedite these effects.

Cumulatively, Alternative 2 provides a balanced approach to travel management by allowing some OHV use to occur in areas where it is sustainable, while protecting natural resources and a variety of recreational settings. Alternatives 1 and 3 would result in more undesirable OHV impacts, while Alternative 4 would propose the most limitations to OHV users. Implementing Alternatives 2 or 4 would result in less potential for trail proliferation, erosion and trail braiding, and when combined with past, present and reasonably foreseeable actions, would result in reduced adverse cumulative impacts.

4.3.2.6 Vegetation

Impacts to vegetation resources will likely occur with the increased need for transportation and utility corridor development related to future mining and pipeline related development, leading to changes to existing vegetation resources and increased potential for establishment of invasive species. Cumulatively, the likelihood of invasive species establishment increases as the areas that are open to vehicular access increases. Additional access may provide a means for more invasive plants to enter and colonize within the river corridor, negatively impacting the landscape. The cumulative impacts of vegetation change in Alternatives 1 and 3 are greater than Alternatives 2 and 4. The more proactive and intensive management actions in Alternatives 2 and 4 will help mitigate undesirable vegetation changes and may have an overall beneficial effect on vegetation resources in the DWSR corridor.

4.3.2.7 Water Quality

Future development activities associated with mineral development would likely have adverse effects on drainage patterns and water quality, although this would depend upon the location and area of activity. Areas adjacent to the DWSR corridor that are disturbed due to mineral development could have long term impacts to water quality in the DWSR corridor. Depending on the level of disturbance, it could take decades to centuries before the structure and function of the original aquatic habitat could be reestablished (NCSU 1998; BLM and Montana Dept. of Environ. Quality 1996; BLM 1988). If road density increases over time with mineral development or pipeline activities, resulting sedimentation would affect water quality. In addition to increased sedimentation, bridges, culverts, and low-flow crossings can act as source points for potential contaminants to enter the watershed. Alternatives 2 and 4 would have the least direct and indirect impacts to water quality, and therefore would have the least cumulative impacts. Alternatives 1 and 3 have the least restrictions on OHV access and motorized boating, and when combined with past, present, and future actions, may have an overall adverse cumulative effect on water quality.

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[3] **Using a highway vehicle** with a curb weight of up to 10,000 pounds, including a four-wheel-drive vehicle and a pickup truck, **or using a recreational-type vehicle** off-road or all-terrain vehicle with a curb weight of up to 1,500 pounds, including a snowmobile (or other tracked vehicle), motorcycle or ATV, on or off an established road easement, if use off the road easement does not cause or contribute to water quality degradation, alteration of drainage systems, significant rutting, ground disturbance, or thermal erosion. (Curb weight means the weight of a vehicle with a full tank of fuel and all fluids topped off, but with no one sitting inside or on the vehicle and no cargo loaded. Most highway rated sport utility vehicles are within the weight limit as are most small ATVs, including a basic Argo.) Use of larger off-road vehicles over 1,500 pounds curb weight, and the off-road travel of construction and mining equipment require a permit from DNR. An authorization is required from the ADF&G-Habitat for any motorized travel in fish bearing streams.

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7.0 APPENDICES

7.1 Benefits Based Recreation Management

7.1.1 Overview

Benefits Based Management (BBM) is an approach to recreation planning that focuses on the activities, experiences, and benefits that are attained by various user groups within a given resource area. Traditionally, recreation managers have focused on developing and maintaining recreational facilities by simply providing programs and services and implementing management controls. Managing for beneficial outcomes requires a shift in the focus of recreation management beyond facility developments, management controls, and providing programs and services. In the traditional approach, users gain certain benefits or outcomes from their recreational experiences, but are often disconnected from the planning process for the resource area, as ideas are usually generated solely by recreation planners without considering the beneficial outcomes of available recreation experiences.

The biggest difference between the traditional approach and the BBM approach is that management objectives can target specific experiences and beneficial outcomes for recreational activities, instead of just simply targeting project development and resource protection. Under the BBM approach, specific experience and benefit outcomes targeted by management objectives are determined by considering the preferences of both visitors and resident customers, the capacity of each recreation management unit to produce the desired recreation opportunities, the availability of other similar opportunities within the immediate market area, and management constraints for the planning area.

7.1.2 Land Use Plan Decisions

The first step in the BBM process is to delineate Special Recreation Management Areas (SRMA) throughout the entire district-wide planning area in a resource management plan (RMP) during the land use planning process. A SRMA designation intensifies management of areas where outdoor recreation is a high priority. It helps direct recreation program priorities toward areas with high resource values, elevated public concerns, or significant amounts of recreational activity. Areas with a SRMA designation can be expected to see investments in recreation facilities and visitor services, aimed at reducing resource damages and mitigating user conflicts.

Each SRMA has a distinct, primary recreation-tourism market, as well as a corresponding and distinguishing recreation management strategy. For each SRMA, it is determined whether that primary market-based strategy will be to manage for a *destination* recreation-tourism market, a *community* recreation-tourism market, or an *undeveloped* recreation-tourism market, which is then stated and described in the land use plan. Next, recreation planners identify specific, distinct areas within each SRMA, called Recreation Management Zones (RMZ), that provide opportunities for different recreational activities and experiences within the SRMA. For each RMZ, the primary activities, experiences, and benefits for that zone are determined through an interactive process with various focus groups and stakeholders who commonly use the area or have a vested interest in the area. After these values are identified, managers can plan their program development and implementation actions to enhance or maintain those sought after outcomes, and the character of recreation settings that foster these outcomes. Using the BBM process, specific setting prescriptions and management actions are created that seek to preserve the identified activities, experiences, and benefits within each RMZ. Each RMZ has four defining characteristics:

1. Each RMZ serves a different recreation niche within the primary recreation market;
2. Each RMZ produces a different set of recreation opportunities and facilitates the attainment of different experiences and benefit outcomes;
3. Each RMZ has a distinctive recreation setting character; and
4. Each RMZ requires a different set of recreation provider actions to meet the strategically-targeted primary recreation market demand.

To address these four defining characteristics listed above within each RMZ, the following land-use allocation decisions must be made at the RMP level for each RMZ that has been designated in the SRMA:

1. Identify the corresponding recreation niche to be served;
2. Write explicit recreation management objectives for the specific recreation opportunities to be produced and the outcomes to be attained (activities, experiences, and benefits);
3. Prescribe recreation setting character conditions required to produce recreation opportunities and facilitate the attainment of both recreation experiences and beneficial outcomes, as targeted above (the recreation opportunity spectrum is one of the existing tools for both describing existing setting character and prescribing desired setting character); and
4. Briefly describe an activity planning framework that addresses recreation management, marketing, monitoring, and administrative support actions (e.g., visitor services, permits and fees, recreation concessions, and appropriate use restrictions) necessary to achieve explicitly-stated recreation management objectives and setting prescriptions (see Implementation Decisions subsection below).

7.1.3 Implementation Decisions

After the primary market based strategy and RMZs have been developed in the land use plan, implementation plans are then completed for each SRMA. SRMA implementation plans are more specific, and describe in detail the management actions, marketing, monitoring, and administrative support actions for each RMZ within the designated SRMA. Specific management actions that are developed in the implementation plan will produce a recreation management scheme that can enhance the desired benefits and outcomes, while providing the infrastructure for sustainable tourism and recreation. For each RMZ, four types of recreation actions must be addressed in the SRMA implementation plan. These actions include:

1. Recreation administration (regulatory; permits and fees, use restrictions; data management; and customer liaison).
2. Recreation management of resources, visitors, and facilities (i.e., developed recreation sites, roads and trails, recreation concessions, etc.);
3. Recreation marketing (including outreach, information and education, promotion, interpretation, environmental education; and other visitor services);
4. Recreation monitoring (including social, environmental, and administrative indicators and standards);

7.1.4 Market Strategy and Recreation Management Zones in the EARMP

The following tables and map depict the market strategy and RMZs for the Delta River SRMA that were developed in the EARMP in 2006. The LUP Amendment will revise these decisions through this EA.

EARMP Market Strategy for the Delta River SRMA

Primary Market Strategy	Primary Market
Destination	Alaska Residents
Tourism Market Product	
The Delta River SRMA includes the Delta National Wild and Scenic River which consists of the upper stretch of the Delta River, all of the Tangle Lakes, and the Tangle River. This SRMA is located and can be accessed approximately 21.5 miles west of the Richardson Highway on the Denali Highway. The Delta River watershed is located in the Alaska Range in south-central Alaska. The watershed drains an area of about 150,000 acres and contains a network of 160 miles of streams and 21 lakes. The Delta flows through the Alaska Range and joins the Tanana River, which flows into the Yukon River. The Delta River is recognized for its outstanding scenery, natural and cultural values, and exceptionally clean waters. One can expect a true Alaskan wilderness experience floating through class I-IV rapids with sightings of wildlife and exceptional fishing opportunities for grayling. Most visitors float the river by canoe or small inflatable raft. The Tangle Lakes are popular for motorized and non-motorized boating and a multitude of other recreational activities. The Tangle Lakes campground and wayside provide RV and tent sites, vault toilets and boat ramps.	

EARMP Delta River RMZ 1 – Tangle Lakes Developed

Niche		
Public and private developed facilities that provide education as well as amenities to users and allows for easy access to lakes and rivers.		
Management Objectives		
To provide quality services and educational information to the public who are visiting and utilizing the local recreational resources including pass through travelers using the Denali Highway. By the year 2015, 75% of users surveyed will reply to BLM that this management objective has been achieved.		
Targeted Outcomes		
Activity	**Experience**	**Benefit**
• camping • fishing • hiking • berry picking • boating • photography • dining • hunting • OHV use • Picnicking • wildlife viewing • learning • comfort stops • swimming	• enjoying the closeness of family • appreciating personal interactions with visitors • enjoying having a wide variety of environments within the single area • having others nearby who could help you if needed • enjoying having easy access to natural landscapes • enjoying group affiliation with groups and togetherness • enjoying participating in group outdoor events • developing skills and abilities • enjoying meeting new people with similar interests • escaping social pressures • teaching others about the outdoors	• stronger ties with family and friends • increased local economic stability • increased local tourism revenue • greater family bonding • improved skills for outdoor enjoyment with others • freedom from urban living • stress reduction • increased tolerance for multi uses of a resource • increased appreciation of an area's cultural history

EARMP Delta River RMZ 2 – Tangle Lakes Dispersed

Niche		
A semi-primitive experience providing access to the Delta River, Upper and Lower Tangle Lakes, and surrounding BLM managed lands.		
Management Objectives		
To protect and enhance the qualities of a semi primitive experience resulting in a user satisfaction of 80% of users as determined by a survey conducted in the year 2015.		
Targeted Outcomes		
Activity	**Experience**	**Benefit**
• camping • fishing • hiking • berry picking • boating • photography • hunting • wildlife viewing • cultural and geological viewing • swimming	• feeling good about solitude • enjoying the artistic expression of nature • getting some exercise • sense of exploration • sensory experiences of a landscape • interacting with people • enjoying an escape from crowds of people • savoring a natural experience • a feeling of accomplishment • risk taking • developing your skills and abilities	• improved skills for outdoor enjoyment • enhanced awareness and understanding of nature • deeper sense of personal humility • greater respect for cultural heritage • freedom from urban living • improved physical fitness and mental health • enhanced lifestyle • reduced looting and vandalism of historic and prehistoric sites • reduced negative human impacts such as litter, trampling of vegetation and unplanned trails

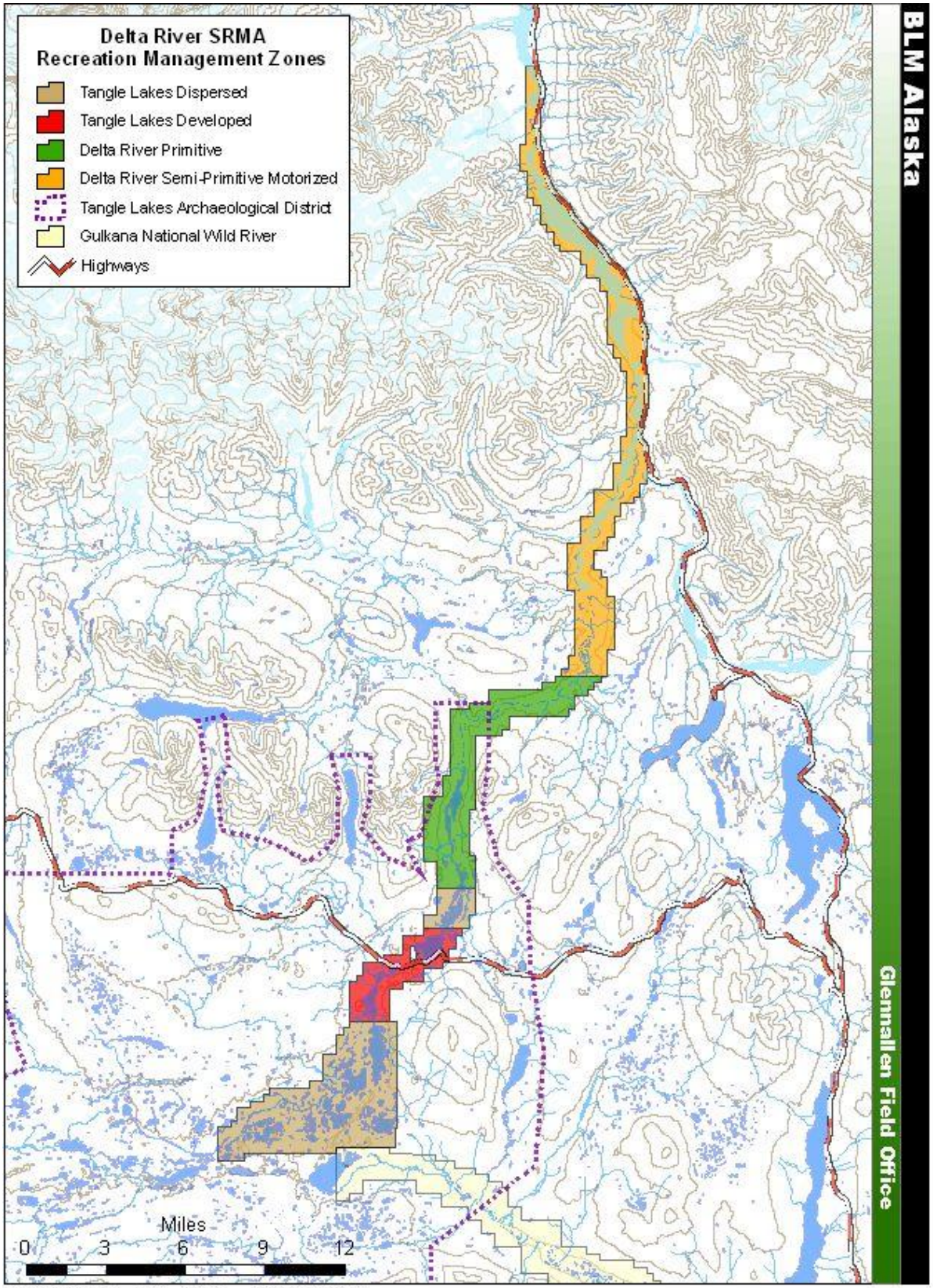
EARMP Delta River RMZ 3 – Delta River Primitive

Niche		
A primitive, non-motorized experience characterized by solitude along the Delta River and surrounding BLM managed lands.		
Management Objectives		
To protect and enhance the values, qualities and characteristics of a primitive landscape that provides for a quality experience for visitor resulting in a user satisfaction of 90% as determined by survey.		
Targeted Outcomes		
Activity	**Experience**	**Benefit**
• non-motorized boating • camping • fishing • hiking • berry picking • photography • hunting • wildlife viewing • cultural and geological viewing • swimming	• risk taking • solitude • testing your endurance • gaining a greater sense of self confidence • savoring the natural landscape • reflecting on ones own character and personal values • bringing back pleasant memories • enjoying the artistic expression of nature • being close to nature • strenuous physical exercise • knowing that things are not going to change too much • conservation of sustainable ecosystems	• improved mental and physical well being • enhanced sense of personal freedom • greater self reliance • improved skills for outdoor enjoyment • enlarged sense of personal accountability for acting responsibility on public lands • closer relationship with the natural world • getting away from society and family • reduced wildlife harassment and disturbance

EARMP Delta River RMZ 4 – Delta River Semiprimitive Motorized

Niche		
Providing for multiple use recreational activities in a semi-primitive setting associated with the Delta River and adjoining trails.		
Management Objectives		
To maintain the semi-primitive, multiple use experience while preventing further resource degradation that provides a quality experience for visitors resulting in user satisfaction rating of 80% determined by a survey conducted in 2015.		
Targeted Outcomes		
Activity	**Experience**	**Benefit**
• boating • camping • fishing • hiking • berry picking photography • hunting • wildlife viewing • geological viewing • off-highway vehicle use	• risk taking • learning outdoor skills • enjoying nature • talking about equipment and gear • getting needed physical exercise • escaping responsibility for awhile • getting needed • being able to tell others about the trip • bringing back pleasant memories • family togetherness • greater sense of independence	• local economic support • greater understanding of technology and mechanics • diminished mental anxiety • improved self confidence • greater community valuation of its ethnic diversity • improved opportunity to view wildlife close up • greater tolerance of multiple uses of landscape

EARMP Delta River SRMA - Recreation Management Zones



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7.2 ANILCA §810 Evaluations and Findings for All Alternatives

E.A. No.: DOI-BLM-AK-050-EA-2008-0001

Applicant: Bureau of Land Management, Glennallen Field Office

Evaluation by: Merben R. Cebrian

1. Evaluation and Finding of Alternative 1 (No Action Alternative)

1.A. Effect of Alternative 1 on subsistence uses and needs:

Fisheries: The Delta River is currently closed to all regulated subsistence fishing. Therefore, Alternative 1 has no significant effect on subsistence fishery uses and needs.

Wildlife: This alternative proposes to continue current management practices on the Delta Wild and Scenic River (WSR). Current practices are considered adequate to meet subsistence needs. Therefore, this alternative will have no significant effect on subsistence uses and needs.

Other resources: The No Action Alternative will not significantly affect other harvestable resources such as berries, willows, firewood, and spruce roots. Current practices are considered adequate to meet subsistence needs. Therefore, this alternative will have no significant effect on subsistence uses and needs.

1.B. Availability of other lands, if any, for the purposes sought to be achieved:

None. Lands available for the purposes of the applicant are limited to BLM lands that are within the Delta WSR. Therefore, no other lands are available for the intended purposes.

1.C. Other alternatives, if any, which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes:

The only alternative that would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes is to not allow or permit any activities that conflict with subsistence uses. However, such an alternative is not viable because the BLM manages public lands for multiple uses.

1.D. Finding:

Under Alternative 1, management of the Delta WSR corridor would continue under the 1983 Delta WSR Management Plan and the 2007 EARMP. Management actions will not result in a significant reduction in subsistence uses. Access to subsistence resources will not be hampered by this alternative. There is no reasonably foreseeable significant decrease in the abundance of harvestable resources and in the distribution of harvestable resources due to this alternative.

2. Evaluation and Finding of Alternative 2 (Proposed Action)

2.A. Effect of Alternative 2 on subsistence uses and needs:

Fisheries: The Delta River is currently closed to all regulated subsistence fishing. Therefore, the proposed action has no significant effect on subsistence fishery uses and needs.

Wildlife: The proposed action intends to regulate OHV use, motorized boating, and campsite occupancy within the Delta WSR corridor.

ANILCA §811 stipulates that “rural residents engaged in subsistence uses shall have reasonable access to subsistence resources on the public lands”, subject to reasonable regulation. The 2007 EARMP §T-4(3)(a) stipulates that “OHVs would be restricted to designated trails (Top of the World Trail, Rainy Creek Trail) ” within the Delta WSR corridor. Concurrent restrictions on OHV travel to designated trails exist within the Tangle Lakes Archaeological District (TLAD) under the 1980 Memorandum of Agreement between BLM Alaska, the Alaska State Historic Preservation Officer, and the Advisory Council on Historic Preservation in compliance with the 1966 National Historic Preservation Act (NHPA). The Delta River is in Game Management Unit (GMU) 13B. Under Alternative 2, an authorization is required for miners and subsistence users using OHVs greater than 2000 lbs on the Top of the World Trail and on Rainy Creek Trail. Although this requirement imposes additional burden to miners and subsistence users, this requirement allows the BLM to monitor impacts of OHVs on designated trails. Between 2005 and 2009, on average, 150 OHVs were estimated to have used the Rainy Creek Trail primarily associated with access to mining claims; an additional 823 OHVs, on average, were estimated to have used the Top of the World Trail (Recreation Management Information System, 2009). These estimates combine mining, recreational and subsistence users of the designated trails. Although there are no trail counters in place on these trails, BLM estimates that most of this reported OHV use occurs on the eastern portion of the Top of the World Trail that is located outside the river corridor. BLM also estimates that approximately 10% of the users on the Top of the World Trail travel into and/or across the designated river corridor. Furthermore, aside from large mining equipment, BLM does not have documented observations of OHVs larger than 2,000 lbs within the river corridor. Subsistence users harvested 31 moose, on average, in GMU 13B from 1990 to 2009 (OSM 2009). The proposed action allows miners and subsistence users to exceed OHV weight restrictions on designated trails and does not impose additional restrictions to access beyond those stipulated in the EARMP and the NHPA that are currently in place. Therefore, the proposed action will not have a significant effect on subsistence uses and needs.

The proposed action requires an authorization to operate a motorized boat for subsistence use in June and July in RMZs 1 and 4. All other RMZs do not have motorized boat restrictions. The Tangle Lakes in RMZ 1 is a potential area for spring hunting of waterfowl and migratory birds in Game Management Unit (GMU) 13. In the Upper Copper River region, residents of Gulkana, Chitina, Tazlina, Copper Center, Gakona, Mantasta Lake, Chistochina, and Cantwell have customary and traditional use in GMU 13 for subsistence hunting of migratory birds based on criteria found in 50 CFR §92.5. 50 CFR §92 regulates the subsistence harvest of migratory bird species in Alaska. No permits are required to harvest migratory birds. In GMU 13, the 2009 season for migratory bird harvest is April 15 – May 26 and June 27 – August 31. Naves (2010, revised) shows that an estimated 1,120 migratory birds were harvested in 2004 and 247 were harvested in 2007 in the Upper Copper River region. Under Alternative 2, subsistence users are required to have an authorization if they wish to harvest migratory birds using a motorized boat on the Delta WSR RMZs 1 and 4 from June 1 to July 31. Subsistence hunters who wish to hunt beaver and snowshoe hare will also be required to have an authorization if they wish to operate a motorized boat in RMZs 1 and 4 on the Delta WSR in June and July. However, low water and geography usually impedes motorized boat travel in RMZs 1 and 4 in June and July. Although the proposed action imposes an additional burden to operate a motorized boat in June and July, this requirement will not have a significant effect on subsistence uses and needs.

The proposed action also intends to limit campsite occupancy on the Delta WSR. Camping will be limited to designated campsites when camping immediately adjacent to the lakes and waters but dispersed camping will be allowed when using Leave No Trace camping methods. Subsistence users typically camp near a kill site for convenience in access to and processing of big game such as moose and caribou. The kill site may be outside of designated campsites. Therefore, allowing dispersed camping for subsistence users will not have a significant effect on subsistence uses and needs.

Hunting of small game and upland birds will not be significantly restricted by the proposed action. Trapping of furbearers will not be significantly restricted by the proposed action since this activity is usually conducted via snowmachine that requires adequate snow cover.

Other resources:

The proposed action will not significantly affect other harvestable resources such as berries, willows, firewood, and spruce roots. Proposed actions that mitigate litter and human waste disposal, fire rings, and campsite impacts will likely be beneficial to the habitat by allowing natural revegetation and minimizing habitat fragmentation.

2.B. Availability of other lands, if any, for the purposes sought to be achieved:

None. Lands available for the purposes of the applicant are limited to BLM lands that are within the Delta WSR. Therefore, no other lands are available for the intended purposes.

2.C. Other alternatives, if any, which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes:

The only other alternative that would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes is to not allow or permit any activities that conflict with subsistence uses. However, such an alternative is not viable because the BLM manages public lands for multiple uses.

2.D. Finding:

Under Alternative 2 (Proposed Action), recreation management on the Delta WSR will not significantly restrict subsistence uses. Access to subsistence resources will not be hampered by this alternative. There is no reasonably foreseeable significant decrease in the abundance of harvestable resources and in the distribution of harvestable resources due to the proposed action alternative.

3. Evaluation and Finding of Alternative 3

3.A. Effect of Alternative 3 on subsistence uses and needs:

Fisheries: The Delta River is currently closed to all regulated subsistence fishing. Therefore, Alternative 3 has no significant effect on subsistence fishery uses and needs.

Wildlife: Under Alternative 3, additional OHV trails will be designated in the Delta WSR, OHVs will be allowed to travel off designated trails for game retrieval, and there will be no weight limits for OHV use. This alternative will not restrict motorized boating, and will regulate campsite occupancy within the Delta WSR corridor.

Alternative 3 will designate additional OHV trails without weight restrictions on the Delta WSR and allows OHVs to travel off designated trails for game retrieval. This will improve access to subsistence resources. However, increasing the number of designated OHV trails may create ruts and mud holes that may affect trail usability especially since travel off designated trails for game retrieval is allowed for both subsistence users and non-subsistence users. There may also be more users that compete for subsistence resources. However, with the moose population in GMU 13 slowly increasing and federal hunt success remaining at 10%, Alternative 3 has no significant effect on subsistence uses and needs.

Motorized boating will be allowed in all RMZs; it is similar to Alternative 1 and is more liberal than Alternative 2. Therefore it has no significant effect on subsistence uses and needs.

Like Alternative 2, Alternative 3 also intends to limit campsite occupancy on the Delta WSR. Camping will be limited to designated campsites when camping immediately adjacent to the lakes and waters but dispersed camping will be allowed when using Leave No Trace camping methods. Subsistence users typically camp near a kill site for convenience in access to and processing of big game such as moose and caribou. The kill site may be outside of designated campsites. Therefore, allowing dispersed camping for subsistence users will not significantly restrict access to subsistence resources. Also under Alternative 3, additional campsites will be developed in high use areas. Although this option provides more opportunities for the recreationist, it may also lead to increased interactions between recreationists and subsistence users. By-products of processing big game in the field include blood, entrails, internal organs, and other anatomical parts that may influence the experience of recreationists who happen to be camping nearby. However, recreationists are largely gone during hunting season, so encounters with subsistence users are likely to be minimal. Therefore, Alternative 3 will not significantly affect subsistence uses and needs.

Hunting of small game and upland birds will not be significantly restricted by Alternative 3. Trapping of furbearers will not be significantly restricted by this alternative since this activity is usually conducted via snowmachine that requires adequate snow cover.

Other resources:

Alternative 3 will not significantly affect other harvestable resources such as berries, willows, firewood, and spruce roots. Under this alternative, actions that mitigate litter and human waste disposal, fire rings, and campsite impacts will likely be beneficial to the habitat by allowing natural revegetation and minimizing habitat fragmentation.

3.B. Availability of other lands, if any, for the purposes sought to be achieved:

None. Lands available for the purposes of the applicant are limited to BLM lands that are within the Delta WSR. Therefore, no other lands are available for the intended purposes.

3.C. Other alternatives, if any, which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes:

The only alternative that would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes is to not allow or permit any activities that conflict with subsistence uses. However, such an alternative is not viable because the BLM manages public lands for multiple uses.

3.D. Finding:

Under Alternative 3, recreation management on the Delta WSR will not significantly restrict subsistence uses. Access to subsistence resources will not be hampered by this alternative. There is no reasonably foreseeable significant decrease in the abundance of harvestable resources and in the distribution of harvestable resources due to Alternative 3.

4. Evaluation and Findings of Alternative 4

4.A. Effect of Alternative 4 on subsistence uses and needs:

Fisheries: The Delta River is currently closed to all regulated subsistence fishing. Therefore, Alternative 4 has no significant effect on subsistence fishery uses and needs.

Wildlife: The proposed action intends to regulate OHV use, motorized boating, and campsite occupancy within the Delta WSR corridor.

Under Alternative 4, an authorization is required for miners and subsistence users using OHVs greater than 2000 lbs on the Top of the World Trail and on Rainy Creek Trail. Although this requirement imposes additional burden to miners and subsistence users, this requirement allows the BLM to monitor impacts of OHVs on designated trails. Between 2005 and 2009, on average, 150 OHVs were estimated to have used the Rainy Creek Trail while an additional 823 OHVs were estimated to have used the Top of the World Trail (Recreation Management Information System, 2009). These estimates combine recreational and subsistence users of the designated trails. Although there are no trail counters in place on these trails, BLM estimates that most of this reported OHV use occurs on the eastern portion of the Top of the World Trail that is located outside the river corridor. BLM also estimates that approximately 10% of the users on the Top of the World Trail travel into and/or across the designated river corridor. Furthermore, aside from large mining equipment, BLM does not have documented observations of OHVs larger than 2,000 lbs within the river corridor. Subsistence users harvested 31 moose, on average, in GMU 13B from 1990 to 2009 (OSM, 2009). Alternative 4 allows miners and subsistence users to exceed OHV weight restrictions on designated trails and does not impose additional restrictions to access beyond those stipulated in the EARMP and the NHPA that are currently in place. Therefore, this alternative will not have a significant effect on subsistence uses and needs.

Under Alternative 4, motorized boats will have horsepower restrictions in all RMZs except RMZ 3. All airboats and hovercrafts will also be prohibited. The Tangle Lakes in RMZ 1 is a potential area for spring hunting of waterfowl and migratory birds in Game Management Unit (GMU) 13. In the Upper Copper River region, residents of Gulkana, Chitina, Tazlina, Copper Center, Gakona, Mantasta Lake, Chistochina, and Cantwell have customary and traditional use in GMU 13 for subsistence hunting of migratory birds based on criteria found in 50 CFR §92.5. 50 CFR §92 regulates the subsistence harvest of migratory bird species in Alaska. No permits are required to harvest migratory birds. In GMU 13, the 2009 season for migratory bird harvest is April 15 – May 26 and June 27 – August 31. Naves (2010, revised) shows that an estimated 1,120 migratory birds were harvested in 2004 and 247 were harvested in 2007 in the Upper Copper River region. Moose and caribou hunters may also choose to hunt with a motorized boat on the Delta WSR. Although Alternative 4 may limit the engine size of motorized boats and prohibits the use of airboats and hovercrafts in the Delta WSR, the limitations do not constitute a significant restriction to access of subsistence resources and does not pose an added burden to subsistence users. Airboats and hovercrafts are not an established use within the river corridor. Airboats have rarely been observed and hovercrafts have never been observed on the river or lakes. Therefore, Alternative 4 will not have a significant effect on subsistence uses and needs.

Alternative 4 also intends to limit campsite occupancy on the Delta WSR. Camping will be limited to designated campsites when camping immediately adjacent to the lakes and waters but dispersed camping will be allowed when using Leave No Trace camping methods. A mandatory camping permit system will be initiated for designated campsites. However, subsistence users who choose to camp away from designated campsites are exempt. Subsistence users typically camp near a kill site for convenience in access to and processing of big game such as moose and caribou. The kill site may be outside of designated campsites. Therefore, allowing dispersed camping for subsistence users will not have a significant effect on subsistence uses and needs.

Hunting of small game and upland birds will not be significantly restricted by Alternative 4. Trapping of furbearers will not be significantly restricted by this alternative since this activity is usually conducted via snowmachine that requires adequate snow cover.

<u>Other resources:</u>

Alternative 4 will not significantly affect other harvestable resources such as berries, willows, firewood, and spruce roots. Actions that mitigate litter and human waste disposal, fire rings, and campsite impacts

will likely be beneficial to the habitat by allowing natural revegetation and minimizing habitat fragmentation.

4.B. Availability of other lands, if any, for the purposes sought to be achieved:

None. Lands available for the purposes of the applicant are limited to BLM lands that are within the Delta WSR. Therefore, no other lands are available for the intended purposes.

4.C. Other alternatives, if any, which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes:

The only other alternative that would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes is to not allow or permit any activities that conflict with subsistence uses. However, such an alternative is not viable because the BLM manages public lands for multiple uses.

4.D. Finding:

Under Alternative 4, recreation management on the Delta WSR will not significantly restrict subsistence uses. Access to subsistence resources will not be hampered by this alternative. There is no reasonably foreseeable significant decrease in the abundance of harvestable resources and in the distribution of harvestable resources due to Alternative 4.

/s/ Merben R. Cebrian 15 March 2010

Merben R. Cebrian Date
Wildlife Biologist
BLM, Glennallen Field Office