



MINIMUM REQUIREMENTS DECISION GUIDE WORKBOOK

"...except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act..."

-- The Wilderness Act of 1964

Project Title:

Assessing the Effects of Traffic (and No Traffic) on the Behavior of Grizzly Bears along the Denali Park Road

MRDG Step 1: Determination

*Determine if Administrative Action is **Necessary***

Description of the Situation

What is the situation that may prompt administrative action?

A closure of Denali National Park and Preserve’s (Denali) sole access road presents an unparalleled opportunity to assess wildlife response to human activity and traffic. From 2023-2024, the Denali Park Road (Park Road) will be closed at mile 43, leaving the remaining 48 miles without typical visitation or administrative traffic.

We propose to study the response of grizzly bears to the absence of traffic along a 40-mile section of the road using a before-after-impact study design. The non-traffic (control) period, 2023-24, will be compared to the impact (treatment) period when traffic resumes in 2025-26. Grizzly bear movement and behavior will also be assessed on a 15-mile section of road with traffic during the entire 4 year study period.

Denali's enabling legislation cites the conservation of and opportunities to view wildlife as reasons for the creation of Mount McKinley National Park in 1917, and for its expansion (and renaming to Denali) in 1980. In 1972, park managers restricted private vehicle traffic along the 91-mile Park Road to preserve wildlife viewing opportunities during surging visitation. Since 1972, Denali’s visitors access the park primarily along the Park Road as they ride on buses which provide wildlife and scenic viewing opportunities and hiking access.

Because of increasing tourism, park managers face pressure to permit more traffic along the Park Road while considering how animals respond to increasing levels of human activities. There is a history of research studying the relationship between traffic and wildlife, however, these studies were all conducted during the visitation season in the presence of varying levels of traffic. Historic studies have not provided park management with the information necessary to address issues concerning the effects of the Park Road on wildlife. Studies in other locations clearly demonstrate displacement of wildlife along roads. Therefore, it is important and timely to determine whether bear behavior is altered by traffic along the Park Road. This opportunity for a “no-traffic control” will provide a once-in-a-century opportunity to assess wildlife movement, habitat use, and behavior during the visitation season in the absence of vehicle traffic. This study will set up future managers with information needed to inform decisions about managing traffic along the Park Road.

Questions that will be investigated:

1. How do bear movement patterns change between areas with extended periods of no traffic compared to areas with periods with varying traffic levels?
2. Do different demographic classes of bears respond differently to traffic on the park road?
3. How do bear movement patterns respond to plant phenology with and without traffic?
4. How do intraspecific interactions and cub survival change based on traffic patterns?

Options Outside of Wilderness

Can action be taken outside of wilderness that adequately addresses the situation?

YES

STOP – DO NOT TAKE ACTION IN WILDERNESS

NO

EXPLAIN AND COMPLETE STEP 1 OF THE MRDG

Explain:

The Park Road is contained within a 300-ft wide corridor excluded from the surrounding Denali Wilderness. While grizzly bears utilize this corridor, much of their habitat is located in designated wilderness. To fully understand grizzly bear movements in relation to vehicular traffic on the Park Road, we must take into account their movements in the wilderness. The spatial information is necessary for the success of this project.

Criteria for Determining Necessity

Is action necessary to meet any of the criteria below?

A. Valid Existing Rights or Special Provisions of Wilderness Legislation

*Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws) that **requires** action? Cite law and section.*

YES NO

Explain:

B. Requirements of Other Legislation

*Is action necessary to meet the requirements of **other federal laws**? Cite law and section.*

YES NO

Explain:

C. Wilderness Character

Is action necessary to preserve one or more of the five qualities of wilderness character?

UNTRAMMELED

YES NO

Explain:

While traffic occurs on the Park Road outside of wilderness, this stream of disturbance could be restricting the free movement of animals across the road corridor, as well as affecting how certain demographics of bears utilize habitat. Information gathered about this impact could result in park managers using more effective means to mitigate this trammeling of wildlife behavior and disruption of natural population dynamics. While this study is not necessary to address this, it could inform better wilderness stewardship in the future.

UNDEVELOPED

YES NO

Explain:

NATURAL

YES NO

Explain:

Many studies have looked at the impacts of vehicular traffic on grizzly bears, but none in Denali have had the opportunity to directly compare a control scenario of an entire season without traffic on a highly utilized section of the Park Road. The information gathered in this study could have long-lasting effects on how park managers regulate traffic in relation to habitat utilization, reproduction, survival, and movement of grizzly bears in the Denali Wilderness. This study is also applicable to other areas where grizzly bears and traffic coexist, including adjacent to wilderness areas.

SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

YES NO

Explain:

OTHER FEATURES OF VALUE

YES NO

Explain:

Step 1 Determination

Is administrative action **necessary** in wilderness?

Criteria for Determining Necessity

A. Existing Rights or Special Provisions	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
B. Requirements of Other Legislation	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
C. Wilderness Character		
Untrammeled	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Undeveloped	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Natural	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
Solitude/Primitive/Unconfined	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Other Features of Value	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO

Is administrative action **necessary** in wilderness?

- YES **EXPLAIN AND COMPLETE STEP 1 OF THE MRDG**
- NO **STOP – DO NOT TAKE ACTION IN WILDERNESS**

Explain:

This project requires gathering information about grizzly bears in designated wilderness, so cannot be conducted outside of wilderness. The information collected could have far reaching impacts on wilderness management both in Denali and other areas where grizzly bears interact with roads and vehicles; however, the study is specific to Denali's unique road and wilderness configuration. This is an unparalleled opportunity to compare a control situation with previous and planned studies.

MRDG Step 2

Determine the **Minimum** Activity

Other Direction

Is there “special provisions” language in legislation (or other Congressional direction) that explicitly **allows** consideration of a use otherwise prohibited by Section 4(c)?

AND/OR

Has the issue been addressed in agency policy, management plans, species recovery plans, or agreements with other agencies or partners?

YES

DESCRIBE OTHER DIRECTION

NO

SKIP AHEAD TO TIME CONSTRAINTS BELOW

Describe Other Direction:

Denali’s 2012 Vehicle Management Plan (VMP) lists a plan objective as, “...managing the transportation system to ensure protection of wildlife populations, wildlife habitat, and the processes and components of the park’s natural ecosystem.” The VMP identified grizzly bears as a key species to monitor, “...because of their relationship to the park’s purpose and significance and because they are...prominent attractions for park visitors who use the transportation system to view wildlife.” However, the VMP indicates that comprehensive monitoring programs will inform adaptive management measures. This study can inform adaptive management.

Grizzly bear monitoring was identified in the Resource Stewardship Strategy 2008-2027 as a data gap.

Time Constraints

What, if any, are the time constraints that may affect the action?

The study must be conducted when grizzly bears are active outside their dens, approximately April-October. The control period must occur when there is no vehicular traffic on the road, predicted to be summers 2023 and 2024.

Components of the Action

What are the discrete components or phases of the action?

Component X: *Example: Transportation of personnel to the project site*

Component 2: Capture of grizzly bears

Component 3: Collaring

Component 4: Tagging

Component 5: Samples

Component 6: Retrieving dropped or mortality collars

Proceed to the alternatives.

Refer to the [MRDG Instructions](#) regarding alternatives and the effects to each of the comparison criteria.

MRDG Step 2: Alternative 1

Aerial capture, GPS collars, helicopter retrieval of collars

Alternative 1:

Description of the Alternative

What are the details of this alternative? When, where, and how will the action occur? What mitigation measures will be taken?

Grizzly bears would be fitted with GPS collars to track their movements over four years. Capture would be conducted aurally using a helicopter and fixed wing aircraft for spotting. One or more biologists/technicians would dart bears from the helicopter, then land the helicopter to allow staff to take biological samples, place ear tags, and attach a GPS collar. The collars would have to be replaced after two years when the batteries fail, so capture work would happen twice. Dropped or mortality collars would be retrieved by helicopter.

Component Activities

How will each of the components of the action be performed under this alternative?

Comp #	<u>Component of the Action</u>	Activity for this Alternative
X	<i>Example: Transportation of personnel to the project site</i>	<i>Example: Personnel will travel by horseback</i>
1	Capture of grizzly bears	Fixed wing for spotting, helicopter for darting and landing. Captured twice during study period to replace the collar.
2	Collaring	GPS collar, designed to drop off at end of collar lifespan.
3	Tagging	One tag in each ear (two total)
4	Samples	Biological samples
5	Retrieving dropped or mortality collars	Collars retrieved by helicopter.

Wilderness Character

What is the effect of each component activity on the qualities of wilderness character? What mitigation measures will be taken?

UNTRAMMELED

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Fixed wing for spotting, helicopter for darting and landing. Captured twice during study period to replace the collar.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	GPS collar, designed to drop off at end of collar lifespan.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	One tag in each ear (two total)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Biological samples	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Collars retrieved by helicopter.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Total Number of Effects		0	-1	NE
Untrammed Total Rating				

Explain:

The capture, handling, and collaring of animals is considered a trammeling action since it is the intentional manipulation of wildlife. The collar and tags are considered installations and are evaluated under the undeveloped quality.

UNDEVELOPED

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Fixed wing for spotting, helicopter for darting and landing. Captured twice during study period to replace the collar.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	GPS collar, designed to drop off at end of collar lifespan.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	One tag in each ear (two total)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Biological samples	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Collars retrieved by helicopter.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	-4	NE
Undeveloped Total Rating		-4		

Explain:

Landing of aircraft (helicopter) and placing temporary (collars) and permanent (tags) installations would negatively affect the undeveloped quality. The ear tags are small but aid in identification of individual bears if collars malfunction or the bear is implicated in a management issue.

NATURAL

Activity #	<u>Component Activity for this Alternative</u>	Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Fixed wing for spotting, helicopter for darting and landing. Captured twice during study period to replace the collar.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	GPS collar, designed to drop off at end of collar lifespan.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	One tag in each ear (two total)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Biological samples	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Collars retrieved by helicopter.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Total Number of Effects		+3	-1	NE
<u>Natural Total Rating</u>		+2		

Explain:

The information gathered from the GPS collar and biological samples are critically important to the goals of the project, which could have far reaching implications for wilderness stewardship. Samples can be used for DNA and diet analysis as well as aging individuals. While the action of capturing wildlife is a trammeling action, the stress upon the individual is an adverse effect of that action so is also considered under the natural quality.

SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

Activity #	<u>Component Activity for this Alternative</u>	Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Fixed wing for spotting, helicopter for darting and landing. Captured twice during study period to replace the collar.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

2	GPS collar, designed to drop off at end of collar lifespan.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	One tag in each ear (two total)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Biological samples	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Collars retrieved by helicopter.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		+2	-4	NE
<u>Solitude or Primitive & Unconfined Rec. Total Rating</u>		-2		

Explain:

Because the western study area will not be accessible by bus during the initial capture period, few if any visitors will be negatively impacted by the aerial capture operations. The eastern study area is (by design as the control within the BACI design) will be open to visitors and bus traffic during the entire study period but capture will occur prior to the road opening. Visitors will be impacted by viewing some bears with GPS collars during the four years of this study (2023-2026). The affected backcountry units will be closed for the brief capture period for visitor safety which will limit opportunities for recreation. Also, the sight of GPS collars and ear tags on grizzly bears could negatively impact visitors, as can the sound of motorized use such as helicopters and fixed wing aircraft. However, the information gained from this study could help inform better management of wildlife viewing opportunities and visitors are often very interested in scientific studies.

OTHER FEATURES OF VALUE

Activity #	<u>Component Activity for this Alternative</u>	Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Fixed wing for spotting, helicopter for darting and landing. Captured twice during study period to replace the collar.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	GPS collar, designed to drop off at end of collar lifespan.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	One tag in each ear (two total)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Biological samples	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Collars retrieved by helicopter.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Total Number of Effects		0	0	NE
<u>Other Features of Value Total Rating</u>		0		

Explain:

Other features of value, including historical, cultural, and paleontological resources, will likely not be affected by these actions.

Summary Ratings for Alternative 1

Wilderness Character	Rating Summary
Untrammeled	-1
Undeveloped	-4
Natural	+2
Solitude or Primitive & Unconfined Recreation	-2
Other Features of Value	0
Wilderness Character Summary Rating	-4

MRDG Step 2: Alternative 2

No Action

Alternative 2:

Description of the Alternative

What are the details of this alternative? When, where, and how will the action occur? What mitigation measures will be taken?

This study would not occur, so no capture, collaring, or tagging would take place, no samples would be taken, and no collars would have to be retrieved. While a no-action alternative is usually not evaluated, this is to gauge the value of the project happening versus not happening.

Component Activities

How will each of the components of the action be performed under this alternative?

Comp #	Component of the Action	Activity for this Alternative
X	<i>Example: Transportation of personnel to the project site</i>	<i>Example: Personnel will travel by horseback</i>
1	Capture of grizzly bears	No capture
2	Collaring	No collaring
3	Tagging	No tagging
4	Samples	No samples
5	Retrieving dropped or malfunctioning collars	No retrieval of collars

Wilderness Character

What is the effect of each component activity on the qualities of wilderness character? What mitigation measures will be taken?

UNTRAMMELED

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	No capture	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

2	No collaring	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	No tagging	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	No samples	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	No retrieval of collars	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Total Number of Effects		0	0	NE
<u>Untrameled Total Rating</u>		0		

Explain:

While there would be no additional trammeling actions that otherwise would have taken place with the study, there are no existing trammeling actions that would be undone.

UNDEVELOPED

Activity #	<u>Component Activity for this Alternative</u>	Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	No capture	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	No collaring	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	No tagging	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	No samples	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	No retrieval of collars	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Total Number of Effects		0	0	NE
<u>Undeveloped Total Rating</u>		0		

Explain:

While there would be no additional impacts to the undeveloped quality, there are no existing impacts that would be removed.

NATURAL

Activity #	<u>Component Activity for this Alternative</u>	Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	No capture	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	No collaring	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3	No tagging	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	No samples	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	No retrieval of collars	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Total Number of Effects		0	-3	NE
<u>Natural Total Rating</u>		-3		

Explain:

The loss of this opportunity is not adequately weighted and reflected in the numerical score. This is a once in a lifetime opportunity to observe grizzly bear movement in relation to a more fully intact wilderness habitat with the absence of traffic on the Park Road. The management ramifications from this study are unknown, but likely highly impactful to both this and other wilderness areas with grizzly bear populations.

SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

Activity #	<u>Component Activity for this Alternative</u>	Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	No capture	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	No collaring	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	No tagging	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	No samples	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	No retrieval of collars	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Total Number of Effects		+2	-2	NE
<u>Solitude or Primitive & Unconfined Rec. Total Rating</u>		0		

Explain:

While visitors would not see grizzly bears with collars or ear tags or have backcountry units temporarily closed, they also would not benefit from the potential improved management of wildlife viewing opportunities on the Park Road and opportunity to engage with scientists in the field.

OTHER FEATURES OF VALUE

Activity #	<u>Component Activity for this Alternative</u>	Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

1	No capture	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	No collaring	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	No tagging	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	No samples	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	No retrieval of collars	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Total Number of Effects		0	0	NE

<u>Other Features of Value Total Rating</u>	0
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Explain:

Other features of value would not be impacted or improved by not conducting this study.

Summary Ratings for Alternative 2
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Wilderness Character	Rating Summary
Untrammeled	0
Undeveloped	0
Natural	-3
Solitude or Primitive & Unconfined Recreation	0
Other Features of Value	0
Wilderness Character Summary Rating	-3

MRDG Step 2: Alternative 3

Aerial capture, GPS collars, helicopter and foot retrieval of collars

Alternative 3:

Description of the Alternative

What are the details of this alternative? When, where, and how will the action occur? What mitigation measures will be taken?

Grizzly bears would be fitted with GPS collars to track their movements over four years. Capture would be conducted aurally using a helicopter and fixed wing aircraft for spotting. One or more biologists/technicians would dart bears from the helicopter, then land the helicopter to allow staff to take biological samples, place ear tags, and attach a GPS collar. The collars would have to be replaced after two years when the batteries fail, so capture work would happen twice. Dropped or mortality collars would be retrieved by foot if within five miles of the Park Road, or with a helicopter if dropped in a remote and inaccessible location, following the end of the four-year study.

Component Activities

How will each of the components of the action be performed under this alternative?

Comp #	Component of the Action	Activity for this Alternative
X	<i>Example: Transportation of personnel to the project site</i>	<i>Example: Personnel will travel by horseback</i>
1	Capture of grizzly bears	Fixed wing for spotting, helicopter for darting and landing. Captured twice during study period to replace the collar.
2	Collaring	GPS collar, designed to drop off at end of collar lifespan.
3	Tagging	One tag in each ear (two total)
4	Samples	Biological samples
5	Retrieving dropped or mortality collars	Retrieve on foot if within 5 miles of the Park Road depending on terrain. Helicopter access for those farther or more inaccessible.

Wilderness Character

What is the effect of each component activity on the qualities of wilderness character? What mitigation measures will be taken?

UNTRAMMELED

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Fixed wing for spotting, helicopter for darting and landing. Captured twice during study period to replace the collar.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	GPS collar, designed to drop off at end of collar lifespan.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	One tag in each ear (two total)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Biological samples	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Retrieve on foot if within 5 miles of the Park Road depending on terrain. Helicopter access for those farther or more inaccessible.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Total Number of Effects		0	-1	NE
Untrammed Total Rating				

Explain:

The capture, handling, and collaring of animals is considered a trammeling action since it is the intentional manipulation of wildlife. The collar and tags are considered installations and are evaluated under the undeveloped quality.

UNDEVELOPED

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Fixed wing for spotting, helicopter for darting and landing. Captured twice during study period to replace the collar.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	GPS collar, designed to drop off at end of collar lifespan.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3	One tag in each ear (two total)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Biological samples	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Retrieve on foot if within 5 miles of the Park Road depending on terrain. Helicopter access for those farther or more inaccessible.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	-4	NE
<u>Undeveloped Total Rating</u>		-4		

Explain:

Landing of aircraft (helicopter) and placing temporary (collars) and permanent (tags) installations would negatively affect the undeveloped quality. The ear tags are small but aid in identification of individual bears if collars malfunction or the bear is implicated in a management issue.

NATURAL

Activity #	<u>Component Activity for this Alternative</u>	Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Fixed wing for spotting, helicopter for darting and landing. Captured twice during study period to replace the collar.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	GPS collar, designed to drop off at end of collar lifespan.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	One tag in each ear (two total)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Biological samples	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Retrieve on foot if within 5 miles of the Park Road depending on terrain. Helicopter access for those farther or more inaccessible.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Total Number of Effects		+3	-1	NE
<u>Natural Total Rating</u>		+2		

Explain:

The information gathered from the GPS collar and biological samples are critically important to the goals of the project, which could have far reaching implications for wilderness stewardship. Samples can be used for DNA and diet analysis as well as aging individuals. While the action of capturing wildlife is a trammeling action, the stress upon the individual is an adverse effect of that action so is also considered under the natural quality.

SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Fixed wing for spotting, helicopter for darting and landing. Captured twice during study period to replace the collar.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	GPS collar, designed to drop off at end of collar lifespan.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	One tag in each ear (two total)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Biological samples	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Retrieve on foot if within 5 miles of the Park Road depending on terrain. Helicopter access for those farther or more inaccessible.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		+3	-4	NE
Solitude or Primitive & Unconfined Rec. Total Rating		-1		

Explain:

Since the study area will not be accessible by bus during capture operations, few if any visitors will be negatively impacted by the aerial capture operations. The affected backcountry units will be closed for the brief capture period for visitor safety which will limit opportunities for recreation. Also, the sight of GPS collars and ear tags on grizzly bears could negatively impact visitors, as can the sound of motorized use such as helicopters and fixed wing aircraft. However, the information gained from this study could help inform better management of wildlife viewing opportunities and visitors are often very interested in scientific studies. Visitors interacting with staff retrieving collars on foot could highly benefit from the interaction and appreciation of preserving wilderness character.

OTHER FEATURES OF VALUE

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
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X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Fixed wing for spotting, helicopter for darting and landing. Captured twice during study period to replace the collar.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	GPS collar, designed to drop off at end of collar lifespan.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	One tag in each ear (two total)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Biological samples	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Retrieve on foot if within 5 miles of the Park Road depending on terrain. Helicopter access for those farther or more inaccessible.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Total Number of Effects		0	0	NE
<u>Other Features of Value Total Rating</u>		0		

Explain:

Other features of value, including historical, cultural, and paleontological resources, will likely not be affected by these actions.

Summary Ratings for Alternative 1

Wilderness Character	Rating Summary
Untrammeled	-1
Undeveloped	-4
Natural	+2
Solitude or Primitive & Unconfined Recreation	-1
Other Features of Value	0
Wilderness Character Summary Rating	-4

MRDG Step 2: Alternatives Not Analyzed

Alternatives Not Analyzed

What alternatives were considered but not analyzed? Why were they not analyzed?

Using culvert traps or leg snares to trap grizzly bears was considered but dismissed as inefficient ways to trap the required number of bears for the study. These methods are more stressful to the individual animal and include a higher risk of injury. Aerial capture is an accepted and humane capture method when done by qualified professionals. Additionally, with the western area's road closure, deployment of the traps wouldn't be feasible for the first phase of the study.

While VHF collars could preclude having to recapture each animal to replace the collar (GPS collars typically only have a battery life of two years while VHF may last longer,) they would require more overflights for tracking and would not provide adequate spatial information for the purposes of the study.

Pit tags are an inadequate way to identify individual bears because they move under the skin and bears are so large, these tags get lost. Ear tags are a better way to identify individuals over the long term that are small and unobtrusive, but easily located under capture conditions.

Hiking to retrieve all collars is unreasonable since collars could be dropped in any location, some of which are long distances from roads or airstrips and inaccessible on foot. However, many collars will likely be reasonable to locate and retrieve on foot and is built into the mitigations for this project.

MRDG Step 2: Alternative Comparison

Alternative 1:	Aerial capture, GPS collars, helicopter retrieval of collars
Alternative 2:	No Action
Alternative 3:	Aerial capture, GPS collars, helicopter and foot retrieval of collars

	Alternative 1	Alternative 1	Alternative 2	Alternative 2	Alternative 3	Alternative 3
Wilderness Character	+	-	+	-	+	-
Untrammled	0	-1	0	0	0	-1
Undeveloped	0	-4	0	0	0	-4
Natural	+3	-1	0	-3	+3	-1
Solitude/Primitive/Unconfined	+2	-4	+2	-2	+3	-4
Other Features of Value	0	0	0	0	0	0
Total Number of Effects	+5	-10	+2	-5	+6	-10
Wilderness Character Rating	-5		-3		-4	

MRDG Step 2: Determination

Refer to the [MRDG Instructions](#) before identifying the selected alternative and explaining the rationale for the selection.

Selected Alternative

- | | |
|--|---|
| <input type="checkbox"/> Alternative 1: | Aerial capture, GPS collars, helicopter retrieval of collars |
| <input type="checkbox"/> Alternative 2: | No Action |
| <input checked="" type="checkbox"/> Alternative 3: | Aerial capture, GPS collars, helicopter and foot retrieval of collars |

Explain Rationale for Selection:

Alternative 3 successfully achieves the goals of the study while preserving wilderness character. Helicopter use is diminished by expanding the use of foot travel for collar retrieval when feasible. The study utilizes well-established capture methods which will have short term impacts to wilderness character while providing long term benefits to the stewardship of the area as wilderness.

Describe Monitoring & Reporting Requirements:

Number and location (GPS waypoints) of helicopter landings and number of new ear tags and collars will be reported to the Wilderness Coordinator on an annual basis. When possible and safe, helicopter landings for breaks to relieve the capture crew should be conducted in the Frontcountry Developed Area (non-wilderness areas of the Old Park, including the Park Road when it is closed.) Affected backcountry units should be closed to overnight use during capture operations for visitor safety.

Approvals

Which of the prohibited uses found in Section 4(c) of the Wilderness Act are approved in the selected alternative and for what quantity?

Approved?	Prohibited Use	Quantity
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<input type="checkbox"/>	Mechanical Transport:	
<input type="checkbox"/>	Motorized Equipment:	
<input type="checkbox"/>	Motor Vehicles:	
<input type="checkbox"/>	Motorboats:	
<input checked="" type="checkbox"/>	Landing of Aircraft:	Use of helicopter for bear capture and some collar
<input type="checkbox"/>	Temporary Roads:	
<input type="checkbox"/>	Structures:	
<input checked="" type="checkbox"/>	Installations:	Ear tags (permanent) and GPS collars (temporary),

Record and report any authorizations of Wilderness Act Section 4(c) prohibited uses according to agency policies or guidance.

Refer to agency policies for the following signature authorities:

Prepared:

Name Sarah Hayes Position General Ranger
Signature on file Date 04/18/2022

Recommended:

Name Sarah Hayes Position General Ranger
Signature on file Date 04/18/2022

Recommended:

Name Dave Schirokauer Position Science and Resources Team Leader
Signature on file Date 04/19/2023

Approved:

Name Brooke Merrell Position Superintendent
Signature on file Date 04/19/2023