INDIAN MOUNDS WILDERNESS ASSESSMENT
STUDY PLAN

REVISED STUDY PLAN
TOLEDO BEND RELICENSING PROJECT
FERC NO. 2305

July 2009

Prepared by:
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Orange, Texas

Sabine River Authority, State of Louisiana
Many, Louisiana
1.0 INTRODUCTION

1.1 General Description of the Toledo Bend Project

The Sabine River Authority of Texas (SRA-TX) and the Sabine River Authority, State of Louisiana (SRA-LA) (collectively, the Authorities) collaborated to develop the Toledo Bend Project (Project) located on the Sabine River. Construction was completed in October 1966. The Project is jointly operated by SRA-TX and SRA-LA through Toledo Bend Project Joint Operations (TBPJO).

The Project was originally planned, licensed, and constructed as a water supply facility, but it also provides multiple uses, such as hydroelectric power generation and recreation. The Project is located approximately 156.5 miles upstream of the confluence of the Sabine River and the Gulf of Mexico. Both the Project and this reach of the river serve as the border between the States of Louisiana and Texas.

The Project Reservoir (which is oriented in a southeast to northwest direction), is approximately 85 miles in length. The Project extends approximately 132 river miles (RM) (channel miles) from Toledo Bend Dam, which is located at RM 147, upstream to above Logansport, Louisiana (i.e., Murvaul Bayou), located at RM 279. The Project occupies lands and waters within Panola, Shelby, Sabine, and Newton Counties in Texas and De Soto, Sabine, and Vernon Parishes in Louisiana. Toledo Bend Reservoir is the largest manmade body of water in the southern United States and the fifth largest in surface area in the country.

The Reservoir has approximately 1,200 miles of shoreline with a water surface area of 185,000 acres at the normal maximum reservoir elevation of 172.0 feet mean sea level (msl). The Toledo Bend Reservoir is 7 miles at its widest point and contains a storage volume of 4,477,000 acre-feet between elevations 162 feet and 172 feet. Primary hydroelectric generation occurs between 168 and 172 feet. The watershed above Toledo Bend Dam is approximately 7,178 square miles with an estimated runoff in 2004 of 3.6 million acre-feet (SRA 2008). Historically, water levels have ranged from 161.3 feet msl to 173.9 feet msl.
As currently licensed, the principal Project works consist of:

- A rolled earth-fill dam with a maximum height of 112 feet and a length of 11,250 feet (including saddle dikes);
- A reservoir covering 185,000 acres with approximately 1,200 miles of shoreline and an active storage capacity of 4,477,000 acre-feet;
- A spillway comprised of a concrete, gravity-type, gated ogee section with a concrete chute and stilling basin located on the left abutment (in Louisiana). The spillway has a maximum length of 838 feet with eleven 40-foot by 28-foot Tainter gates. The top of the gates is at elevation 173 feet and top of the spillway ogee is at elevation 145 feet. A continuous flow of 144 cubic feet per second (cfs) is provided at the spillway;
- A powerhouse located in the right abutment (in Texas) containing two 58,500 horsepower (43.875-MW) vertical Kaplan turbines with direct drive generators, a tailrace channel, and appurtenant electrical and mechanical facilities.

1.2 Relicensing Process


Pursuant to the FERC ILP regulations, the Authorities filed their Pre-Application Document (PAD) and Notice of Intent (NOI) with FERC on September 22, 2008 (18 CFR §§ 5.5, 5.6). Following the Authorities’ filing of the PAD and NOI, FERC issued Scoping Document 1 (SD1) on November 21, 2008 and convened scoping meetings and a site tour for agencies and members of the public on December 16 – 17, 2008. Based on the information in the PAD and SD1, as well as information exchanged in the scoping meetings, agencies and other stakeholders had until January 21, 2009 to submit comments and study requests. The Authorities received comments and study requests from six resource agencies, one non-governmental organization, and FERC Staff. In total, these commenters recommended forty-four studies, including one study related to the Indian Mounds Wilderness. The Authorities carefully reviewed the recommended studies,
and developed the proposed Indian Mounds Wilderness Assessment Study Plan which was filed with the FERC on March 9, 2009.

On March 25, 2009, the Authorities held the required Proposed Study Plan Meeting with the agencies and stakeholders. Based on the comments and recommendations from this meeting, the Authorities prepared an updated Proposed Study Plan that was distributed to the stakeholders for review and comment on May 27, 2009. The stakeholders (including the United States Forest Service (USFS)) then filed their comments on the updated Proposed Study Plan with the FERC on June 8, 2009. After careful review of comments at the stakeholder meeting and comments on the updated Proposed Study Plan, the Authorities have developed this Revised Study Plan for FERC review and approval.

2.0 GOALS AND OBJECTIVES

The United States Forest Service (USFS) is a natural resource agency dedicated to the sustained management of the nation’s natural resources, service to people, and through Federal law and regulations of the Secretary of Agriculture has major responsibility for the protection and management of Wilderness resources. USFS is directly responsible for the management of the Indian Mounds Wilderness Area, which was added to the National Wilderness Preservation System by the US Congress on October 30, 1984 under the Texas Wilderness Act (PL 98-574). The area contains 12,086 acres and these lands are managed as “Primitive.” It is a concern of the USFS to retain the wilderness character of these lands.

The goal of this study is to evaluate any effects of access from Toledo Bend Reservoir on wilderness resources in Indian Mounds Wilderness (Wilderness).

The objectives of the study are to:

(1) Identify any sites within the Indian Mounds Wilderness used by recreationists from Toledo Bend Reservoir.

(2) Determine resource damage within Indian Mounds Wilderness, if any, from use by recreationists who access the area via the Toledo Bend Reservoir, including the presence of any boat slips.
Identify Wilderness resource restoration needs, if any, associated with use by recreationists who access the Wilderness via the Toledo Bend Reservoir.

The information from this study could be used to develop a monitoring protocol and/or a restoration program for any Wilderness resources that are found to be affected by recreationists who access the Wilderness via the Toledo Bend Reservoir.

3.0 STUDY AREA

The study area will be the Toledo Bend Reservoir shoreline that abuts the Indian Mound Wilderness and inland areas within the Wilderness found to be accessed by recreationists from the Toledo Bend Reservoir. There are no developed recreation facilities or designated campsites within the Wilderness. The Indian Mounds Wilderness is located within the Sabine National Forest and covers an area of 12,086-acres along the western shoreline of Toledo Bend Reservoir.

4.0 BACKGROUND AND EXISTING INFORMATION

No previous study has been performed to assess the impacts to Wilderness resources that may be occurring due to recreationists who access the Wilderness via the Toledo Bend Reservoir. Although no existing information identifies any Project-related effects to the Wilderness area, or suggests that recreational activities are adversely affecting the Wilderness area, it is reasonable to conclude that some recreationists may have accessed the Wilderness from the Toledo Bend Reservoir since the establishment of the Wilderness area in 1984.

5.0 PROJECT NEXUS

The Wilderness covers an area of 12,086-acres and is located along approximately 21 miles of the western shoreline of Toledo Bend Reservoir in Sabine County, Texas. It was established in 1984 by the United States Congress under the Texas Wilderness Act. As established in 1984, portions of the Wilderness extend down to the shoreline of the Toledo Bend Reservoir. The Wilderness was established after the Project was licensed by the FERC’s predecessor the Federal Power Commission (i.e., during the current license term).
Adjacent to the Wilderness is the Indian Mounds Recreation Area, which is located within the Sabine National Forest on the western shore of Toledo Bend Reservoir, approximately 19 miles east of Hemphill, Texas, off State Highway 83 and FSR 3382. The area offers a two-lane boat ramp, 38 campsites, drinking water, and toilet facilities, plus numerous opportunities for fishing, picnicking, hiking, backpacking, hunting, and offers access to the Wilderness. It is maintained and operated by SRA-TX under a Special Use Permit issued by the United States Forest Service (USFS). It is possible that recreationists could utilize this or other developed recreation access sites to boat-in to the undeveloped Wilderness shoreline.

Currently, Wilderness resource conditions and impacts of access to the Wilderness from the Toledo Bend Reservoir are unknown. If Project-related adverse effects on these resources are identified, measures may be developed to help protect the Wilderness and mitigate these effects.

6.0 METHODOLOGY

The methods for conducting the study described above in the goals and objectives are as follows. USFS’ Minimum Recreation Site Monitoring Protocol (Appendix A) will be used to fulfill the objectives identified above.

(1) Identify Campsites/Use Sites. To determine where sites are located, a survey will be conducted by boat to view the reservoir shoreline. Each Wilderness access from the reservoir as denoted by informal foot-trails will be identified. Any informal use areas within and outside the Project Boundary that are accessed via the reservoir will be documented with GPS, recorded into GIS, and located on a map.

(2) Assess Campsite/Use Site Condition. Assess independently (a) groundcover disturbance of the main site, (b) impact to standing trees and roots, and (c) size of disturbed area (including any satellite tent pads and boat slips). Make note of any structures that have been constructed by users. Take pictures for additional documentation.

a) Record disturbance to the groundcover of the central portion of the campsite (disregarding satellite disturbed areas) as one of the following classes.
- Select a midpoint when the condition is close to the boundary between classes.
- Ground vegetation flattened but not permanently injured. Minimal physical change except for possibly a simple rock fireplace.
- Ground vegetation worn away around fireplace or center of activity.
- Ground vegetation lost on most of the site, but humus and litter still present in all but a few areas.
- Bare mineral soil widespread over most of the campsite.

As a general rule of thumb, if bare area (without vegetation) is virtually absent, assign a rating of one. If bare area is obvious at the center of the site, extending out somewhat from a fire ring, but a single 2-person tent would extend onto portions of the site that are still vegetated (i.e. the bare area cannot accommodate both a fire ring and a single tent), assign the site a rating of two. If the central bare area is large enough to accommodate a fire ring, as well as two 2-person tents, assign a rating of three (if most of the bare area still retains a humus/litter cover) or a rating of four (if the humus/litter cover is gone from most of the site). A site with enough bare area to accommodate a fire ring and one adjacent 2-person tent would be given a rating of 2.5.

b) Record tree damage as one of the following classes, depending on the number of trees that have been severely damaged. Include any trees judged to have been damaged as a result of camping activities at the site being monitored. Severely damaged trees are those that have been felled and are at least 10 cm (4 inches) in diameter where felled (if trees have multiple stems, consider the tree felled if any stem at least 10 cm (4 inches) in diameter has been cut off); have scarring that exceeds 1000 cm² (1 ft²) in total area; or have highly exposed roots (more than 1 m (3 feet) of root sticks out at least 2.5 cm (1 inch) above the ground surface). Select a midpoint when the condition is close to the boundary between classes.
0 - No more than 3 severely damaged trees  
1 - 4 to 10 severely damaged trees  
2 - More than 10 severely damaged trees

c) Record disturbed area as one of the following classes, depending on the size of the area disturbed by camping activities, including the main campsite and satellite tent pads. Include if there is a landing area for boats. In most situations, disturbed places are distinguished by obvious vegetation loss, either complete lack of vegetation or sparse vegetation resulting from trampling. Places where vegetation has been flattened but is likely to recover in the short-term should not be included in the disturbed area. Where vegetation is naturally absent, it may be necessary to identify disturbed places based on flattening of soil or litter on the forest floor. When there are multiple separate disturbed parts of the campsite, do not include undisturbed areas in between. For example, if there is a main campsite and two tent pads assess the size of each of the three areas separately and then sum them. Social trails between separate disturbed areas can be ignored.

0 – No more than 25 m² (0-250 ft²)  
1 – 26 to 100 m² (251 - 1000 ft²)  
2 – More than 100 m² (more than 1000 ft²)

Using this protocol, assign the campsite an overall impact rating between 1 and 8. This is the sum of the groundcover disturbance rating (1-4), the tree damage rating (0-2), and the disturbed area rating (0-2). It should take no more than a minute or two to assign a rating at each site, and an adaptation of the forms provided in Appendix B (Recreation Site Monitoring – Field Techniques and Forms) can be used to record the information.
6.1 Data Analysis and Reporting

The results of this assessment will be recorded in the condensed form and detailed site forms completed during the assessment (Appendix B). A map identifying the location of the sites inventoried and photo-documentation of each site will be produced. A report will be produced summarizing the number informal use areas in the Wilderness accessed by foot-trails from the reservoir, the extent of impacts to wilderness resources in these areas, and any resource restoration needs cataloged during the assessment. This information will be provided to the FERC and USFS.

7.0 SCHEDULE

1. FERC issues the Study Plan Report: August 7, 2009
2. Prepare data Collection Forms and Coordinate Logistics: August 10-29, 2009
3. Field Data Collection Commences: September 6, 2009
4. Data Compilation, Review, and Summary: September 14-November 6, 2009

8.0 BUDGET

This study would likely take three months to complete. The anticipated cost for this study is $30,000.

9.0 DISCUSSION OF ALTERNATIVE APPROACHES

The proposed methods for this study are consistent with USFS methods. No alternative approaches to this study have been identified.
ATTACHMENT A
USFS MINIMUM RECREATION SITE MONITORING PROTOCOL
<table>
<thead>
<tr>
<th>IMPACT EVALUATION</th>
<th>ON CAMPSITE</th>
<th>ON UNUSED COMPARATIVE AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>(19) VEGETATION COVER:</td>
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<tr>
<td>(Be sure to compare similar areas, same species, slope, rockiness, and canopy cover)</td>
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<td>1 = 0-5%</td>
<td>3 = 20-50%</td>
<td>5 = 75-100%</td>
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<tr>
<td>2 = 6-25%</td>
<td>4 = 51-75%</td>
<td>2 = 8-25%</td>
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<tr>
<td>3 = 26-50%</td>
<td>5 = 76-100%</td>
<td>4 = 51-75%</td>
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<tr>
<td>(20) MINERAL SOIL EXPOSURE:</td>
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<tr>
<td>(Percent of area that is bare mineral soil)</td>
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<tr>
<td>1 = 0-5%</td>
<td>3 = 20-50%</td>
<td>5 = 75-100%</td>
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<td>2 = 6-25%</td>
<td>4 = 51-75%</td>
<td>2 = 8-25%</td>
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<td>5 = 76-100%</td>
<td>4 = 51-75%</td>
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</tbody>
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<table>
<thead>
<tr>
<th></th>
<th>Rating (Circle one category)</th>
<th>Calculation of impact index (see in office)</th>
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<tbody>
<tr>
<td>(21) VEGETATION LOSS:</td>
<td>1 (No difference in coverage)</td>
<td>2 (Difference one coverage class)</td>
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<tr>
<td></td>
<td>2 (Difference two or more coverage classes)</td>
<td></td>
</tr>
</tbody>
</table>

| (22) MINERAL SOIL INCREASE: | (No difference in coverage) |
|                               | (Difference one coverage class) |
|                               | (Difference two or more coverage classes) |

| (23) TREE DAMAGE: | No. of trees scarred or killed lower branches |
|                  | 1-3 badly scarred or killed |
|                  | (> 6 scarred trees, or > 3 badly scarred or killed) |

| (24) ROOT EXPOSURE: | No. of trees with roots exposed |
|                    | 1-5 trees with roots exposed |
|                    | (> 6 trees with roots exposed) |

| (25) DEVELOPMENT: | None |
|                  | (1 fire ring or other major development) |

| (26) CLEANLINESS: | No. of fire scars from 1 fire ring |
|                  | (Remnants of > 1 fire ring, some litter or manure) |
|                  | (Human waste, much litter or manure) |

| (27) SOCIAL TRAILS: | No. of trails |
|                    | (2-3 discernible, max. 1 well-worn) |
|                    | (> 3 discernible or more than 1 well-worn) |

| (28) CAMP AREA: | Estimated area |
|                | (< 500 ft²) |
|                | (500 - 2000 ft²) |
|                | (> 2000 ft²) |

| (29) BARREN CORE CAMP AREA: | (< 50 ft²) |
|                             | (50 - 500 ft²) |
|                             | (> 500 ft²) |

| (30) PHOTO RECORD: |                      |

| (31) COMMENTS: | (Details about location of site, impacts, management suggestions, etc.) | (32) IMPACT INDEX |
APPENDIX A

Minimum Recreation Site Monitoring Protocol
Version 4/19/2006

Recreation Site Monitoring Procedures for Element 6 of the Chief’s 10 Year Wilderness Stewardship Challenge

Introduction
The objective for developing this Minimum Recreation Site Monitoring Protocol is to provide a consistent process for monitoring of recreation sites in wilderness areas in the national forests. The most common and potentially important types of impact have been included in this minimum protocol but, due to differences in ecosystems and other parameters, not all sites will have all indicators (i.e. trees on site). Where this occurs, managers may wish to develop additional monitoring indicators and procedures to adequately monitor recreation site conditions.

Standards
1. Sites must be censused—it is not sufficient to monitor only a sample of campsites.
2. For full credit, all likely locations in the entire wilderness must be visited—not just likely locations in a portion of the wilderness. Partial credit can be obtained for a census of a portion of the wilderness. Criteria for “likely locations” can be developed locally but the goal should be that >95% of campsites are located.
3. Data cannot be older than 10 years for credit. Data no older than 5 years is recommended.
4. Data for each site must include: (a) location (site coordinates—derived from GPS, a dot on a topographic map and supplemented with a photo is best); (b) campsite condition; and (c) presence/absence of administrative structures.

Procedures for inventorying campsites
Identify all the locations where campsites are likely to be located on a map and develop a plan to visit all these places. This would include all trail corridors as well as off-trail routes and destinations that receive regular use. The inventory can be conducted in a single field season or it can be done over several seasons. For example, a large wilderness might plan to inventory 1/5 of their area every year repeatedly, accomplishing a complete reinventory every 5 years.

Areas that are searched for campsites need to be documented so it is clear when new campsites are found whether it is a new campsite or perhaps an old campsite in a place that has never been searched before. Every place that has been clearly impacted by camping should be inventoried as a campsite, even if the site is to be restored. Where campfires are allowed, campfire remains (e.g. scattered charcoal) provides the most reliable indication of campsite impact on very lightly-impacted campsites. Where campfires are not allowed, other criteria will have to be developed for identifying lightly-
impacted campsites. At each inventoried campsite, either use a GPS to obtain site coordinates or carefully place a dot on a topographic map and obtain site coordinates from the map. Particularly if a GPS is not used, take a photograph of the campsite to facilitate future relocation of the campsite.

Procedures for assessing campsite condition
Independently assess (1) groundcover disturbance of the main campsite, (2) impact to standing trees and roots, and (3) size of disturbed area (including satellite tent pads and stock-holding areas). Each of these three parameters should be separately assessed. They are combined in a single impact index but the individual ratings will be kept separate as well. In addition, any administratively provided structures are recorded.

Record disturbance to the groundcover of the central portion of the campsite
(disregarding satellite disturbed areas) as one of the following classes. Select a midpoint when the condition is close to the boundary between classes.

1 – Ground vegetation flattened but not permanently injured. Minimal physical change except for possibly a simple rock fireplace.
2 – Ground vegetation worn away around fireplace or center of activity.
3 – Ground vegetation lost on most of the site, but humus and litter still present in all but a few areas.
4 – Bare mineral soil widespread over most of the campsite.

As a general rule of thumb, if bare area (without vegetation) is virtually absent, assign a rating of 1. If bare area is obvious at the center of the site, extending out somewhat from a fire ring, but a single 2-person tent would extend onto portions of the site that are still vegetated (i.e. the bare area cannot accommodate both a fire ring and a single tent), assign the site a rating of 2. If the central bare area is large enough to accommodate a fire ring, as well as two 2-person tents, assign a rating of 3 (if most of the bare area still retains a humus/litter cover) or a rating of 4 (if the humus/litter cover is gone from most of the site). A site with enough bare area to accommodate a fire ring and one adjacent 2-person tent would be given a rating of 2.5.

Note – see (Condition Class Ratings for Eastern Wilderness.doc) and (Condition Class Ratings for Western Wilderness.doc) for images that may be useful for determining ratings for disturbance to groundcover.

Record tree damage as one of the following classes, depending on the number of trees that have been severely damaged. Assess damage off-site as well as on-site, particularly in stock-holding areas associated with the campsite. Include any trees judged to have been damaged as a result of camping activities at the site being monitored. Severely damaged trees are those that (1) have been felled and are at least 10 cm (4 inches) in diameter where felled (if trees have multiple stems, consider the tree felled if any stem at least 10 cm (4 inches) in diameter has been cut off); (2) have scarring that exceeds 1000 cm² (1 ft²) in total area or (3) have highly exposed roots (more than 1 m (3 feet) of root
sticks out at least 2.5 cm (1 inch) above the ground surface. Select a midpoint when the condition is close to the boundary between classes.

- 0 – No more than 3 severely damaged trees.
- 1 – 4 to 10 severely damaged trees.
- 2 – More than 10 severely damaged trees.

**Record disturbed area** as one of the following classes, depending on the size of the area disturbed by camping activities, including the main campsite, satellite tent pads and areas where horses are confined. Where there is a landing area for boats, include this. In most situations, disturbed places are distinguished by obvious vegetation loss (either complete lack of vegetation or sparse vegetation resulting from trampling). Places where vegetation has been flattened but is likely to recover in the short-term should not be included in the disturbed area. Where vegetation is naturally absent, it may be necessary to identify disturbed places on the basis of flattening of soil or litter on the forest floor (see special situation 1 below). When there are multiple separate disturbed parts of the campsite, do NOT include undisturbed areas in between. For example, if there is a main campsite, two tent pads and a stock-holding area, assess the size of each of the four areas separately and then sum them. Social trails between separate disturbed areas can be ignored. Select a midpoint when the condition is close to the boundary between classes.

- 0 – No more than 25 m² (0-250 ft²).
- 1 – 26 to 100 m² (251 - 1000 ft²).
- 2 – More than 100 m² (more than 1000 ft²).

Using this protocol, assign the campsite an overall impact rating between 1 and 8. This is the sum of the groundcover disturbance rating (1-4), the tree damage rating (0-2) and the disturbed area rating (0-2). **It should take no more than a minute or two to assign a rating.**

**Record the presence/absence of various administrative structures.** If structures are present, note their type (e.g. corral, table, toilet, fireplace, etc.) and the number of each. This should not include user-built structures, although information about the prevalence of user-built structures is one of many types of recommended information that go beyond the minimum protocol.

**Special Situations**

1. **Procedures for campsites without much perennial understory vegetation and/or without organic soil horizons.**

On sites without organic soil horizons and/or much perennial vegetation (for example, desert sites, beaches, sites on rock, sites dominated by annual vegetation or sites in the dense shade where understory vegetation is absent), the groundcover class definitions must be adapted. It would be good to note whether standard or adapted groundcover classes were used.
In ecosystem types with a poorly developed organic soil horizon, use the level of soil compaction to differentiate between class 3 and class 4 campsites. Where there is sparse but regularly-distributed perennial vegetation, use the size of the central area from which all perennial vegetation has been eliminated (irregardless of the annual vegetation) to differentiate between class 2 and class 3. Where there is little perennial vegetation, use the size of the central area that has experienced long-term flattening of the soil surface to differentiate between class 2 and class 3. This might involve flattening of microbiotic crusts and a hummocky or rocky surface in deserts or flattening/abrasion of forest litter in dense shade. Conversely, a campsite entirely confined to a vegetation-less beach or a rocky ledge would always get a rating of 1 because there is no long-term flattening of the soil.

Ratings for sites in ecosystem types that have perennial vegetation but lack organic horizons would be as follows:
1 – Evidence of camping but minimal physical change except for possibly a simple rock fireplace.
2 – Perennial vegetation gone and soil surface flattened (for the long-term) around fireplace or center of activity.
3 – Perennial vegetation gone and soil surface flattened (for the long-term) on most of the site, but exposed mineral soil not highly compacted except in a few areas.
4 – Mineral soil exposed and highly compacted (to a cement-like state) over most of the campsite.

Ratings for sites in ecosystem types that lack both perennial vegetation and organic horizons would be as follows:
1 – Evidence of camping but minimal physical change except for possibly a simple rock fireplace.
2 – Soil surface flattened (for the long-term) around fireplace or center of activity.
3 – Soil surface flattened (for the long-term) on most of the site, but exposed mineral soil not highly compacted except in a few areas.
4 – Mineral soil exposed and highly compacted (to a cement-like state) over most of the campsite.

2. Procedures for campsites with no trees
These campsites would be given a rating of 0 (no tree damage).

Procedures for wildernesses with established campsite monitoring protocols
Some wildernesses already have impact assessment procedures that are as effective as our proposed procedures but that are simply different. These procedures are adequate for getting credit for Element 6 if they record (a) location; (b) campsite condition; and (c) presence/absence of administrative structures and meet the other standards described above.

Recommended Additional Procedures
We strongly recommend that this minimum protocol be supplemented with additional data that is both more comprehensive and more precise. This minimum protocol does not
provide information sufficient to be used to assess change over time on individual sites, unless the amount of change is huge. Nor does it document all the significant types of impact occurring on campsites. We are in the process of developing further information for monitoring protocols that go beyond the minimally acceptable procedures described above.

Contacts for Additional Information

Recreation Site Monitoring Procedures and Protocols:
David Cole, Aldo Leopold Wilderness Research Institute, 406-549-4199, dcole@fs.fed.us.

Toolbox comments or additions:
Tom Carlson, Arthur Carhart National Wilderness Training Center, 406-243-4630, tcarlson@fs.fed.us
APPENDIX B

Recreation Site Monitoring - Field Techniques and Forms
for
Element 6 of the 10 Year Wilderness Stewardship Challenge

Ideally, GPS units with data dictionaries (or GPS units in combination with PDAs) and
digital cameras can be taken into the field, allowing for on-site electronic capture of data.
This allows the observer to record the site coordinates of the site and then enter the other
bits of information required:
- Campsite number
- Ground disturbance rating, between 1 and 4
- Tree damage rating, between 0 and 2
- Disturbed area rating, between 0 and 2
- Overall impact rating, between 1 and 8 (the sum of the three ratings above)
- Type and number of administratively provided structure.

Alternatively, data can be collected on paper forms. We provide two prototypes below
but recommend that these be adapted to meet local needs. In particular, forms will vary
depending on the frequency and type of administratively provided structures existing on
campsites. If structures are rare, one column is probably sufficient to capture data. If
particular types of structures are common, it might be most efficient to provide separate
columns for each type of structure (e.g. toilets, fireplaces, etc.).

The first format is highly condensed, with multiple campsites on a page. Instructions
could be taped into the inside cover of a pocket-sized, write-in-the-rain booklet, with data
recorded on a single line for each campsite. The second format provides more detailed
information on procedures on each form, but requires a page for each campsite. Note in
each of the forms the opportunity to check whether or not an adaptation of the ground
disturbance rating was used instead of the standard rating (see section on Special
Situations in the protocol).
1. Condensed Form

<table>
<thead>
<tr>
<th>Campsite Number (n)</th>
<th>Site Coordinates (UTM or LAT/LONG)</th>
<th>Ground Disturbance Rating* (1-4)</th>
<th>Tree Damage Rating (0-2)</th>
<th>Disturbed Area Rating (0-2)</th>
<th>Overall Impact Rating (0-8)</th>
<th>Administratively Provided Structures (list type and #)</th>
</tr>
</thead>
<tbody>
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* Place an asterisk after the rating if an adaptation of the ground disturbance rating was used instead of the standard rating (see section on Special Situations in the protocol).
2. Detailed Form – One form per campsite

SITE INFORMATION

Campsite number: __________________ Date: __________________
Location: __________________ Crew: __________________

GPS Coordinates:

UTM: ___ ___ m East ___ ___ m North

LAT: ___ ___ ___ ___
LONG: ___ ___ ___ ___

USGS Map Quad: __________________ Photo ID: __________________
CAMPsite CONDITION RATING – Check the rating that applies for each Part described below.

Part A. Disturbance to Groundcover Rating
(Note: See the SPECIAL SITUATIONS section in the Campsite Monitoring Procedures for alternate criteria if needed. If an alternative is used, place an asterisk after the rating)

1. ______ – Ground cover vegetation flattened, not permanently damaged, minimal change except for rock fireplace.
2. ______ – Ground vegetation worn away around fireplace or center of activity.
3. ______ – Ground vegetation lost on most of site, most humus and litter still present.
4. ______ – Bare mineral spoil widespread over most of site.

Part B. Tree Damage Rating

0. ______ 0-3 severely damaged trees or no trees on site
1. ______ 4-10 severely damaged trees
2. ______ 11 or more severely damaged trees

Part C. Disturbed Area Rating

0. ______ 0-25 m² (0-250 ft²)
1. ______ 26-100 m² (251-1000 ft²)
2. ______ More than 100 m² (more than 1000 ft²)

Part D. Overall Impact Rating

____ Sum of index ratings for Part A + Part B + Part C

Part E. Administrative Structures (record number of structures present by type)

____ Toilet ______ Hitch rail ______ Sign
____ Fireplace ______ Corral ______ Tent pad
____ Food storage pole or box Other
____ TOTAL number of structures
### APPENDIX C

**CAMP SITE INVENTORY**

**GENERAL SITE DESCRIPTION**

1. **SITE NUMBER:** __________
2. **UTM COORDINATES:** _____ E _____ N
3. **USGS QUADRANGLE:** __________
4. **DATE CODED:** ___ (Month) ___ (Day) _____ (Year)
5. **CODED BY:** (Name) __________
6. **ELEVATION:** (To nearest 100 ft) __________
7. **VEGETATION:**
   - 1 – Closed forest
   - 2 – Open forest
   - 3 – Nonforested, densely vegetated
   - 4 – Nonforested, sparsely vegetated
   - Dominant species __________
   - Habitat type, if known __________
8. **LANDFORM:**
   - 1 – Floodplain
   - 2 – Other valley bottom
   - 3 – Cirque basin
   - 4 – Sidistlopa
   - 5 – Ridgeline
   - 6 – Other __________
9. **DISTANCE TO CLOSEST TRAILHEAD:** _______ (miles)
10. **DISTANCE TO CONSTRUCTED TRAIL:** _______ (feet)
    - Screen: 1 – Complete
      - Maintained: 1 – Yes
      - (circle one) 2 – Partial
      - (circle one) 2 – No
    - 3 – None
11. **DISTANCE TO WATER:** _______ (feet)
    - Type: 1 – River/creek
      - 2 – Lake
      - 3 – Spring
      - 4 – Other __________
12. **DISTANCE TO CLOSEST CAMPsite:** _______ (feet)
    - Screening: 1 – Complete
      - 2 – Partial
      - 3 – None
      - (circle one)
    - (Do in office)
13. **NUMBER OF OTHER CAMPSITES WITHIN ¼ MILE:** _______
14. **MAXIMUM PARTY SIZE ACCOMMODATED:**
    - (Circle one)
      - 1 - 1-2
      - 2 - 3-6
      - 3 - 7-10
      - 4 - 11-15
      - 5 - more than 15
15. **TYPE OF USE:** (Circle as many as apply)
    - 1 - Foot
    - 2 - Stock
16. **CLOSEST FIREWOOD SOURCE:**
    - (Circle One)
      - 1 – On-site
      - 2 – < 100 feet
      - 3 – 100 – 300 feet
      - 4 – > 300 ft
17. **CLOSEST FORAGE SUPPLY:**
    - (Circle One)
      - 1 – On-site
      - 2 – < 100 feet
      - 3 – 100 – 300 feet
      - 4 – > 300 ft
18. **FACILITIES:**
    - Present ______ Absent ______
    - (If present, write number of each type in blank)
      - 1 – Fire ring
      - 2 – Primitive seat
      - 3 – Constructed seat
      - 4 – Table/counter
      - 5 – Meat rack
      - 6 – Hitchrack
      - 7 – Corral
      - 8 – Toilet