



U.S. Forest Service National Minimum Protocol for Monitoring Outstanding Opportunities for Solitude

Element 5 of the 10-Year Wilderness Stewardship Challenge

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Element 5: This wilderness has adequate direction, monitoring, and management actions to protect opportunities for solitude or primitive and unconfined recreation.

Introduction

Overview & Scope

This protocol provides a consistent process for monitoring the opportunities for solitude in wildernesses in national forests. It is based on the assumption that encounters – specifically, seeing or hearing other people during a wilderness trip – is the best available indicator of opportunities for solitude. Usually this will be the number of other people seen or heard, that is, the number of encounters. This is a minimum protocol that will help managers identify situations where they may need to undertake additional monitoring or implement management actions; wildernesses with more extensive, previously established monitoring should consider whether or not to continue using existing protocols.

In situations where managers suspect that opportunities for solitude are at risk, they may wish to develop additional monitoring indicators and conduct more intensive sampling. This minimum protocol does not generate data that can be used to draw statistically valid inferences about encounters because it relies on a convenience (non-random) sample of observations. However, by substituting a random sample for the convenience sample, this limitation can be overcome, and some wildernesses may wish to do that. (See Appendix 1 (FAQs) for information about how to draw a random sample.)

Element 5 addresses three components of experience opportunities: solitude, primitive recreation, and unconfined recreation. This protocol addresses only solitude; monitoring opportunities for primitive and unconfined components is not included.

Standards/Requirements

Because wildernesses vary dramatically in size and use, wildernesses have been classified into three types for this protocol, based on use level and trail miles from the national complexity classifications (see http://fsweb.wo.fs.fed.us/rhwr/wilderness/wimst/wilderness_classification_solitude.xlsx). Miles of trail is used in this classification, but if a wilderness has other types of travel corridors (e.g., established user trails, slot canyons, river segments, or canoe routes), those should be considered equivalent to trails for the purposes of this monitoring. The same data are collected for Type 1 and Type 2 wildernesses, but the number of monitoring areas is different, as explained below. For Type 3 areas, this protocol does not apply.

- Type 1: “High” or “Medium” use wildernesses with > 75 miles of travel corridor; “Low” use wildernesses with > 100 miles of travel corridor.
- Type 2: “High” or “Medium” use wildernesses with 1-75 miles of travel corridor; “Low” use wildernesses with 1-100 miles of travel corridor.
- Type 3: Wildernesses with no miles of travel corridor.

To earn 4 points for Element 5, data must be complete (collected and summarized) for each selected **monitoring area**¹:

- A minimum of 5 weekday and 5 weekend (or holiday) **monitoring sessions** need to be conducted for each monitoring area in each wilderness
- A minimum of 4 hours per monitoring session must be spent collecting data within a specified monitoring area. Data collection for traveling encounters must be done during high-use, daytime hours, generally between 8:00 a.m. and 6:00 p.m., although data for camp encounters may be collected at any time of day.
- Data cannot be older than 10 years for credit. Data no older than 5 years is recommended.
- Records should include a description of how opportunity classes or zones were applied in the wilderness, a rationale for the number of monitoring areas included, and the basis for choosing specific monitoring areas².
- It is not necessary for your wilderness to have a specific indicator (or standards) to earn 4 points for Element 5.

Type 3 areas need to develop their own protocol to gain points, or they can choose to use the sampling approach for Type 2 wildernesses.

Procedures³

Prior to data collection

Prior to collecting data, several steps are required. First, **review your forest or wilderness plan** to understand what, if any, indicators and standards have been developed. This may influence how you collect your data or the particular places you sample. For instance, if your forest plan has standards for the number of groups encountered, you will need to alter this protocol to count groups, rather than (or in addition to) individuals. The way standards are described in plans will also influence how you analyze your data. For example, many plans have standards for the percent of days that encounters can be above a specified number (e.g., “80% of the time a visitor will encounter 10 or fewer groups”). This requires defining what counts as a “day” (see below), as well as aggregating the observations obtained for each day. Other plans may have standards for the average number of encounters per day.

This protocol is based on zoning wildernesses according to current use levels. Your wilderness may already be divided into **opportunity classes** (e.g., transition, semi-primitive, primitive-trailed, pristine), and you can use those for this protocol. If so, you will need to understand where zone boundaries are located and ensure that field data collectors have appropriate maps. If opportunity classes have not been defined, you should classify each travel corridor/destination into one of four “use zone” classes

¹ See Appendix 1 for definitions of key terms.

² See Appendix 2 for suggested documentation.

³ See Appendix 3 for a checksheet of steps.

(very high, high, moderate, or low use), using your best professional judgment⁴. There is an expectation that approximately 90% of visitation will occur in very high, high, or moderate use areas. **Low use areas are not monitored in this minimum protocol**, although managers may want to collect data in them for other reasons.

Attention should be paid to **scheduling patrols** in ways that can optimize collecting usable encounter data. For instance, the protocol requires that 4 hours be spent collecting data in a monitoring area, so if rangers are planning to visit a monitoring area for other purposes, they should be asked to spend at least 4 hours there, either in one consecutive period or total throughout a single day (e.g., 2 hours in the morning and 2 hours in the afternoon).

Data can be collected by wilderness rangers during regular patrols or by volunteers. Regardless of who collects data, they should be **adequately trained** in applying the protocol. Misconceptions and errors have been documented in the past and these are addressed in this protocol. Nevertheless, data should be regularly reviewed to ensure accuracy and completeness.

Procedures for selecting monitoring areas

In this protocol, data are collected for “**monitoring areas**.” Monitoring areas should be large enough to make sense for 4 hours of data collection (e.g., a 1-mile stretch of trail between two junctions is probably too small, while a 15-mile stretch of trail may be too long) and should match as closely as possible the dominant use patterns (e.g., for a 2-mile trail to a popular lake, it would probably make sense to include the access trail and lake all as one “monitoring area”). There may be exceptions that justify different decisions; for instance, if a popular waterfall is located at the end of a 1-mile trail, you may choose to consider this a use zone. It is important to do what makes sense according to the way people use your wilderness, and then document those decisions.

The first step is to verify the classification of each wilderness. If there is reason to reclassify a wilderness, document the decision process. For **Type 1 wildernesses**, identify **two locations** (e.g., trail corridors, trail + destination, or destination area) **within each opportunity class except the low-use class** that will be your monitoring areas. Depending on the number of opportunity classes, this will result in between 2 and 6 monitoring areas per wilderness; in most Type 1 wildernesses, there will be 6 monitoring areas (resulting in 60 monitoring sessions). For **Type 2 wildernesses**, identify **one location⁵ within each opportunity class except the low-use class**. Depending on the number of opportunity classes, this will result in between 1 and 3 monitoring areas (i.e., between 10 and 30 monitoring sessions).

Candidate areas should be carefully considered, and reasons for choices should be documented. Factors to consider include the following:

⁴ See Appendix 4, “Guidance for establishing use zones”

⁵ Although this protocol requires monitoring on only one location in Type 2 wildernesses, some wildernesses may choose to monitor more than one area for some use zones.

- Do you want to monitor areas that can serve as indicators of other similar areas? If so, you may want to choose areas that you consider to be most “typical” in terms of visitation.
- Do you have key areas that receive regular visitation by rangers or volunteers? If so, you may want to choose some of these for monitoring.
- Is your wilderness low use overall, so that it is unlikely that any areas will exceed standards for encounters? If so, you might want to choose your highest use area within each opportunity class, because such areas could act as red flag warnings.

The decision about which monitoring areas to choose is a judgment call, based on your consideration of many different factors. Therefore, each wilderness could have a different approach to selecting monitoring areas.

It is necessary to collect the data in a way that one observation can be compared to another and that data for a given monitoring area can be combined. Therefore, ***spatial boundaries for each monitoring area need to be clearly defined***. It is less important exactly where the boundaries are than to have them be consistently applied by each data collector. For example, in some wildernesses the decision might be made not to collect data on the first mile of a busy access trail, while in other wildernesses data might be collected starting at the trailhead.

It is also important to ***define the temporal bounds*** for data collection; usually this will refer to the high-use season, such as from Memorial Day to Labor Day. Again, this determination is made locally, but should be documented.

Each of the monitoring areas within each opportunity class should be ***monitored on at least 5 weekdays and 5 weekend days (or holidays)***. Data can be collected over 2-3 consecutive years and aggregated, if it is not possible to collect all the data in a single year.

The decision about the specific dates for monitoring is important. The minimum protocol accepts data that are collected as part of other duties during scheduled work patrols of the monitoring areas. Because these dates are not randomly chosen, this is called a convenience sample, and data cannot be used to draw statistically valid inferences to conditions at other times or to make statistically valid comparisons across time. The data are still useful, because they can suggest whether opportunities for solitude are impaired, which could trigger more rigorous sampling in subsequent years. Also, careful consideration of the specific dates of data collection may allow reasonable inferences about overall conditions. (For instance, if rangers were present on 10 of the highest use days of the year, but saw only a handful of other people, it is likely that opportunities for solitude are even higher during the rest of the year.)

Note: Though it is not required, it is highly recommended that trail counters be installed on access trails to monitoring areas. Data from counters can be used to explore the relationship between encounters and use levels, which could potentially be used as a proxy for encounter monitoring, if relationships are sufficiently strong.

Procedures for data collection

For each monitoring session you will need to record details about the monitoring session itself and data about two types of encounters:

- 1) **traveling encounters** are people you see and/or hear while traveling in the monitoring area⁶. You will need to establish guidelines about observer behavior – for instance whether the observer should stay only on established trails, whether observers should travel like “typical” visitors, or whether observers should sit at a destination and count people from a single vantage point. Again, there is not one correct approach for all wildernesses and it is more important to adopt, and document, the approach you use. 2) **camp encounters** refer to the number of other camping groups visible or audible from each occupied campsite.
- 2) If more than one monitoring area is traversed in a day, tally encounters on a separate encounters data form for each monitoring area.

Every encounter should be recorded during a monitoring session. Remember, too, that it is as important to document times when there are no encounters as times when other people are encountered.

Filling out data forms

Traveling Encounters Instructions:

1. At the beginning of each monitoring session, **record initial information** at the top of the form (Figure 1), including:
 - The opportunity class and monitoring area name
 - The observer’s name
 - The date
 - The time when data collection started
 - Whether data are being collected on a weekday, weekend, or holiday
2. Tally the **number of people encountered** within the monitoring area. Count all people seen or heard, no matter how close or far you are from them. If you hike past a camping group, include the number of people you see as traveling encounters (this includes administrative or outfitted camps – the idea is to document the impacts to visitors’ experiences).
 - a. If you can’t get an exact count of the number of people, make your best estimate.
 - b. If you see the same group more than once during a monitoring session, record the number of people as another (new) encounter if more than 15 minutes have passed since the first time you saw the group.

⁶ Most wildernesses will use people seen or heard; however, in some wildernesses it may be appropriate (and is acceptable) to supplement or replace this indicator with things such as the number of cruise ships heard, or number of vehicles seen from wilderness trails.

3. At the end of the monitoring session, fill out the **final information** on the form:
 - Record the time when data collection for this monitoring session stopped
 - Calculate the total amount of time during which data were collected
 - Record the total number of people encountered

Figure 1. Data Collection Form

Traveling Encounters Form	
Opportunity Class/Use Zone:	Observer:
Monitoring Area Name:	Start Time:
Date:	Stop Time:
<input type="checkbox"/> Weekday <input type="checkbox"/> Weekend <input type="checkbox"/> Holiday	Total Time:
Tally number of people encountered here:	
Total encounters:	
Camp Encounters Form	
Campsite Number/Description	# occupied sites w/in sight or continuous sound

Camp Encounters Instructions:

1. Every time you see a **campsite occupied by recreational visitors**, at any time of day or night, complete one line on the “Camp Encounters” form. From the vicinity of each occupied camp, count the number of other occupied camps within sight or continuous sound. (Continuous sound refers to sounds like conversation or routine camp activities that can be regularly heard from one campsite to the next.) Under “campsite” on the form, record the location or site number (if your wilderness has that information); otherwise simply number each observed camp consecutively for each monitoring day.
2. If you are working in the same area for several days, complete the survey each day. Thus, if a group camped on more than one day, there will be data recorded for that camp once per day.

3. It is essential that all occupied campsites be recorded – **regardless of whether or not there are other groups camping within sight or continuous sound** – so that data will be accurate. If no other occupied camps are within sight or continuous sound of an occupied site, enter a “0” in the “Number of occupied sites seen or heard” field. [Note: if the number of occupied sites within sight/sound changes over the course of the observation period, record the largest number observed at any given time.]
4. Do not record other camps within sight or sound of assigned or reserved outfitter camps, administrative sites and long-term Forest Service camps such as a trail construction camp, because the goal is to understand the visitors’ experience (not the agency staff experience). However, when assessing the number of other camps within sight or sound of an occupied visitor camp, outfitter and USFS camps *should* be documented under the “number of occupied sites seen or heard” field. Also, if such camps are seen while traveling through a monitoring area, they should be included on the traveling encounters form.

Data management and analysis

Data management should begin as soon as data collection begins. It is important to review data forms regularly to be sure that observers are collecting all the data and doing it properly.

Analysis of data can be done with simple Excel spreadsheets. Although there are different ways to format spreadsheets, Figure 2 displays all the fields required to analyze the traveling encounters data.

Data collected over different length observation periods must be standardized for the purposes of aggregation and analysis. This can be done by computing the number of people per hour (Figure 3). The Excel function is: “= (cell reference1/cell reference2)” where “cell reference1” is the cell containing the number of people encountered and “cell reference 2” is the cell containing the number of hours.

In many wildernesses, standards are written as the “number of encounters per day.” In the example in Figure 3, it is assumed that the length of a day is eight hours, so the number of people per hour is converted to the number of people per day by multiplying by eight. In Figure 3, data are sorted by use zones (opportunity class), which permits quick calculation of the percentage of days on which the number of encounters per day (see column I) is above the specified standard. For instance, if the standard was 40 encounters per day in Use Zone I, this standard was exceeded 100% of the time. On the other hand, if the standard for Use Zone II was 20 encounters per day, this was exceeded 50% of the time (3 of 6 days). Note that you could sort the data by both use zone and day of week, which would permit you to determine the average number of encounters (or percent of days above standard) separately for weekdays and weekends/holidays.

Figure 2. Example of raw data in Excel spreadsheet for traveling encounters

	A	B	C	D	E	F	G
1			Use			Day of	# People
2	Date	Observer	Zone	Monitoring Area	Hours	week	encountered
3	7/4/2011	Hall	I	Marion Lake	4.5	Holiday	76
4	7/4/2011	Hall	II	Blue lake	4.0	Holiday	5
5	7/6/2011	Grossenberg	I	Marion Lake	6.3	Weekday	47
6	7/7/2011	Grossenberg	III	Lula Lake	8.0	Weekday	3
7	7/17/2011	Hall	I	Pamelia Lake	5.0	Weekend	56
8	7/18/2011	Hall	II	Blue lake	4.0	Weekday	6
9	7/18/2011	Hall	III	Lula Lake	4.0	Weekday	2
10	7/20/2011	Grossenberg	I	Pamelia Lake	6.8	Weekday	39
11	7/21/2011	Grossenberg	III	Berley Lakes	9.5	Weekday	5
12	7/24/2011	Hall	III	Berley Lakes	5.8	Weekend	7
13	7/27/2011	Hall	II	Duffy Lake	4.0	Weekday	10
14	7/27/2011	Hall	I	Marion Lake	4.0	Weekday	25
15	8/6/2011	Grossenberg	I	Pamelia Lake	6.5	Weekend	40
16	8/6/2011	Hall	II	Duffy Lake	7.3	Weekend	37
17	8/7/2011	Grossenberg	III	Lula Lake	5.8	Weekend	0
18	8/10/2011	Hall	II	Blue lake	4.0	Weekday	7
19	8/10/2011	Hall	II	Duffy Lake	4.0	Weekday	15
20	8/12/2011	Grossenberg	III	Berley Lakes	7.0	Weekday	3
21							
22	Use Zone I	Transition					
23	Use Zone II	Semi-primitive					
24	Use Zone III	Primitive-trailed					
25							

Figure 3. Data on traveling encounters, sorted by Use Zone

	A	B	C	D	E	F	G	H	I
29			Use	Monitoring		Day of	# People	# People	# People
30	Date	Observer	Zone	Area	Hours	week	encountered	per hour	per 8 hours
31	7/4/2011	Hall	I	Marion Lake	4.5	Holiday	76	16.89	135.11
32	7/6/2011	Grossenberg	I	Marion Lake	6.3	Weekday	47	7.52	60.16
33	7/27/2011	Hall	I	Marion Lake	4.0	Weekday	25	6.25	50.00
34	7/17/2011	Hall	I	Pamelia Lake	5.0	Weekend	56	11.20	89.60
35	7/20/2011	Grossenberg	I	Pamelia Lake	6.8	Weekday	39	5.78	46.22
36	8/6/2011	Grossenberg	I	Pamelia Lake	6.5	Weekend	40	6.15	49.23
37	7/4/2011	Hall	II	Blue lake	4.0	Holiday	5	1.25	10.00
38	7/18/2011	Hall	II	Blue lake	4.0	Weekday	6	1.50	12.00
39	8/10/2011	Hall	II	Blue lake	4.0	Weekday	7	1.75	14.00
40	7/27/2011	Hall	II	Duffy Lake	4.0	Weekday	10	2.50	20.00
41	8/6/2011	Hall	II	Duffy Lake	7.3	Weekend	37	5.10	40.83
42	8/10/2011	Hall	II	Duffy Lake	4.0	Weekday	15	3.75	30.00
43	7/21/2011	Grossenberg	III	Berley Lakes	9.5	Weekday	5	0.53	4.21
44	7/24/2011	Hall	III	Berley Lakes	5.8	Weekend	7	1.22	9.74
45	8/12/2011	Grossenberg	III	Berley Lakes	7.0	Weekday	3	0.43	3.43
46	7/7/2011	Grossenberg	III	Lula Lake	8.0	Weekday	3	0.38	3.00
47	7/18/2011	Hall	III	Lula Lake	4.0	Weekday	2	0.50	4.00
48	8/7/2011	Grossenberg	III	Lula Lake	5.8	Weekend	0	0.00	0.00
49									

Note: People per hour and people per 8 hours were computed using Excel functions

Figure 4 illustrates a sample spreadsheet for camp encounter data. In this example, Column F, the campsite number, simply refers to the sequence of campsites observed on each day (first, second, etc.), although if you want to understand occupancy for specific sites, you could enter identifying information for individual sites (e.g., Marion Lake Site #5, Duffy Lake Site #10).

In Figure 5, the camp encounter data have been sorted by use zone, to permit computation of the number of occupied sites within sight or sound of each camping party. For instance, in Use Zone I, 5 different camps were occupied during the 5 monitoring sessions, and only one of these had other camps within sight or sound. Thus, the percentage of sites with other camps in sight or sound was 20% (1 divided by 5). In Use Zone III, of the 4 camps observed during 4 monitoring sessions, one (25%) had another group camped within sight or sound.

Figure 4. Example Excel spreadsheet for camp encounters data

	A	B	C	D	E	F	G
1			Use	Monitoring	Day of		Camps in
2	Date	Observer	Zone	Area	week	Campsite	sight/sound
3	7/4/2011	Hall	I	Marion Lake	Holiday	1	0
4	7/4/2011	Hall	II	Blue Lake	Holiday	2	1
5	7/6/2011	Grossenburg	I	Marion Lake	Weekday	1	0
6	7/7/2011	Grossenburg	III	Lula Lake	Weekday	1	0
7	7/9/2011	Grossenburg	III	Lula Lake	Weekday	None	
8	7/17/2011	Hall	I	Marion Lake	Weekend	1	2
9	7/18/2011	Hall	II	Blue Lake	Weekday	1	0
10	7/18/2011	Hall	III	Lula Lake	Weekday	2	0
11	7/20/2011	Grossenburg	I	Marion Lake	Weekday	1	0
12	7/21/2011	Grossenburg	III	Lula Lake	Weekday	1	0
13	7/23/2011	Grossenburg	II	Blue Lake	Weekday	None	
14	7/24/2011	Hall	III	Lula Lake	Weekend	1	2
15	7/27/2011	Hall	II	Blue Lake	Weekday	1	0
16	7/27/2011	Hall	I	Marion Lake	Weekday	2	0
17							
18	None = no occupied camps observed						

Figure 5. Data for camp encounters, sorted by use zone

	A	B	C	D	E	F	G
1			Use	Monitoring	Day of		Camps in
2	Date	Observer	Zone	Area	week	Campsite	sight/sound
23	7/4/2011	Hall	I	Marion Lake	Holiday	1	0
24	7/6/2011	grossenburg	I	Marion Lake	Weekday	1	0
25	7/17/2011	Hall	I	Marion Lake	Weekend	1	2
26	7/20/2011	grossenburg	I	Marion Lake	Weekday	1	0
27	7/27/2011	Hall	I	Marion Lake	Weekday	2	0
28	7/4/2011	Hall	II	Blue Lake	Holiday	2	1
29	7/18/2011	Hall	II	Blue Lake	Weekday	1	0
30	7/27/2011	Hall	II	Blue Lake	Weekday	1	0
31	7/7/2011	grossenburg	III	Lula Lake	Weekday	1	0
32	7/18/2011	Hall	III	Lula Lake	Weekday	2	0
33	7/21/2011	grossenburg	III	Lula Lake	Weekday	1	0
34	7/24/2011	Hall	III	Lula Lake	Weekend	1	2
35							
36		Camps	% camps with				
37		observed	others in sight or sound				
38	Use Zone I		5	20%			
39	Use Zone II		3	33%			
40	Use Zone III		4	25%			
41							

Other Considerations for Element 5

Using pre-existing protocols

Most existing protocols being used for solitude monitoring are more extensive than this minimum protocol. Such protocols are adequate for getting credit for Element 5 if (a) they represent all but the lowest use opportunity class in the wilderness and entail sampling of at least as many monitoring areas as identified in this protocol; and (b) they document camp encounters and traveling encounters. Traveling encounters may be either the number of people or the number of groups encountered. (Although the minimum protocol uses the number of individual people encountered, if an existing protocol documents only the number of groups, this would qualify as adequate for credit.)

Recommended additional data

This minimum protocol is designed for typical Type 1 and Type 2 wildernesses. Large, complex wildernesses (or wildernesses managed by multiple units) may choose to add additional monitoring areas beyond those selected for the minimum protocol.

It is strongly recommend that this minimum protocol be supplemented with additional data about individual encounters, such as mode of travel, presence of dogs, whether campers have fires, or other managerially useful information. The most time and resources go into getting staff into the field, and the additional effort required to collect other information about groups encountered is minimal. Several templates for field forms are available (**see toolbox on wilderness.net**).

Wilderness managers might also wish to add data collection elements unrelated to solitude. For example, the Klamath National Forest supplemented the field form to include documentation of sightings of cattle for management purposes.

This minimum protocol does not provide information sufficient to assess change over time at specific destinations. More intensive sampling, with random selection of dates, would be needed to make that assessment. It is recommended that data on trail use (e.g., with mechanical or other trail counters) be collected during the time that encounter data are collected. This can be used to determine whether visitation (traffic counts) could be an adequate surrogate for monitoring encounters directly.

Contact for Additional Information

Monitoring for outstanding opportunities for solitude or primitive and unconfined recreation:

Troy Hall, Oregon State University, troy.hall@oregonstate.edu

Appendix1: Outstanding Opportunities FAQs

Definitions:

What is an “encounter”?

- In this protocol, a “**traveling encounter**” is defined as occurring when an observer sees at least one other person, regardless of the duration or proximity of the contact. Encounters are recorded as the number of people seen or heard.
- Special circumstances, such as seeing cruise ships or people who are outside of the wilderness, can be accommodated. You simply need to decide, and document, your decision rules.
- “traveling encounters” are people you see and/or hear while traveling on or off trail, but not from a camp. This includes, for instance:
 - Someone seen across a lake
 - A camping party you pass while hiking
 - People who hike past you on the trail
- “**Camp encounters**” are other groups camped within sight or sound of any campsite occupied by visitors. This determination should be made by visiting each occupied site.

What is an “occupied camp”?

- A campsite is considered occupied if there is evidence that recreational visitors are currently camping there, even if no people are present at the time the camp is observed.

What is a “monitoring area”?

- A monitoring area is a defined geographical location within which encounter data are collected. It can be a trail corridor, a destination, an off-trail area, or a combination of these. It should make sense from a managerial visitor use perspective and accommodate 4 hours of data collection per monitoring session.

What is a monitoring “day”?

- A day can be any length of time, though most monitoring programs consider a day to be 8 to 12 hours. Because it is recommended to convert encounter data into the number of encounters per hour for analysis, the length of the day does not matter.

What is a “monitoring session”?

- A monitoring session must include at least four hours of traveling encounter data collection on any given day, within a specified monitoring area. This can be either one continuous block of time, or total during a given day (for instance, if two hours are spent in the area in the morning, and two hours are spent in the area later in the day).

What is an “opportunity class” or “use zone”?

- Many wildernesses have established formal opportunity classes (WROS classes) as part of their forest plan. These map and identify management objectives for the wilderness.
- If opportunity classes have not previously been established, for this monitoring protocol you will need to establish and map “use zones.” These are not a formal part of planning documents, but will guide data collection. The appropriate number of categories will depend on the use patterns in your wildernesses. Very lightly used wildernesses will have only two zones (“low” and “moderate”), while heavily used wildernesses may have up to four zones (“low,” “moderate,” “high,” and “extremely high”). These zones reflect current conditions, not desired future conditions.

Questions related to the general approach:

Why not use trail counters or wilderness permits?

- Research has found that data on visitation from trail counters or wilderness permits often do not provide a good indication of the number of encounters visitors have with others. Even if there is a strong relationship between visitation and encounters, the specific relationship must be established for each travel area, which requires considerable staff time and statistical analysis. Therefore, this protocol requires data for actual encounters.
- However, it is strongly recommended that trail counters be used on trails where encounter data are collected. If this is done, the relationship between use and encounters can be determined, and the trail counters could be used for continued, more comprehensive monitoring over time.

Why are the sample minimums set at 5 weekdays and 5 weekend days?

- Use tends to be higher on weekends in most wildernesses, so having a sample of both weekdays and weekend days will give a more valid indication of the overall status of opportunities for solitude.
- 10 days of data, during the high use season, should give a reasonable indication of overall opportunities for solitude in a given monitoring area. As noted in the protocol, however, this intensity is not sufficient to make firm conclusions or to document trends over time.

Why not collect data from low use areas?

- According to the definition used in this protocol, low use areas – in total – receive less than about 10% of the use to a wilderness. Therefore it is assumed that encounter rates in these areas will be extremely low. It is not efficient to monitor encounters in such areas, and therefore the protocol does not require it.
- However, managers may choose to monitor in low use areas if they have reasons to do so.

Can I collect other data besides the fields included on the minimum protocol data form?

- Yes. The protocol can easily be tailored to add additional information, such as length of stay (day or overnight), whether visitors have a wilderness permit, whether campers have fires, etc. Different forms would be needed, and many examples are available on wilderness.net.
- You may have additional local needs, for instance tracking overflights or encounters with cattle. If so, these data should be collected as well, though this is not required for credit in the 10YWSC.

Questions related to specific data collection instructions:

Why do you count people instead of groups?

- Counting people avoids the common problem in busy locations of not being able to determine which people are in which groups.
- However, if you have a reason to count groups, rather than people, that will qualify as conforming to this minimum protocol.

Why count everyone seen, instead of only people passed on the trail?

- Counting everyone seen or heard avoids problems of having to decide whether to count someone as an encounter based on a subjective estimate of how far away they are. Additionally, in the wildest zones, seeing people in the distance may diminish the sense of solitude, even if they don't come very close to you.

Why count traveling encounters and occupied sites separately?

- Research suggests that encounters at campsites can have a significant impact on visitors' experiences and sense of solitude, so it is important to record those encounters. On the other hand, because day visitors do not camp, the only encounters they have are traveling encounters, and it is important to be able to document those types of encounters. Additionally, management actions to improve or maintain opportunities for solitude at camps and while traveling could be different.

Why do observers need to be present for 4 hours?

- Analysis of comprehensive encounter data has shown that 3-4 hours is the minimum time block needed to gain a valid indication of the number of encounters a person would have over an 8-hour time period. Counting encounters for 4 hours is a strong indicator of (highly correlated with) the total number of encounters in a full day.

What do I do if I encounter the same group more than one time?

- In this protocol, any group seen more than one time is considered an additional (new) encounter if more than 15 minutes have elapsed since the time the group was first seen. This is a judgment call, and amending the protocol to fit your unique situation is acceptable.

What if an observer loses track of encounters while talking with visitors or performing other duties?

- It is important to be as accurate as possible in documenting encounters. However, if you lose track of numbers, make a note of the gap in data and simply subtract that amount of time from the overall monitoring session.

Other questions:

Why doesn't the protocol include primitive and unconfined recreation?

- The aspects of Element 5 related to primitive and unconfined recreation are best tracked through upward reporting in InfraWILD. For instance, the opportunity for primitive recreation is related to trail development and the presence of structures, while the opportunity for unconfined recreation is affected by the number and type of regulations on visitors.
- Monitoring opportunities for solitude is best done by collecting field data, and there have been many requests for guidance in establishing procedures for collecting such data.

How do I generate a random sample of dates?

- You may want to have a more rigorous and defensible dataset than would be obtained with the convenience sampling approach in the minimum protocol (perhaps because you want to track trends over time, you want to make a determination about whether a monitoring area is out of compliance with wilderness plan standards, or other reasons). Dates can be randomly sampled using any random number generator – simply assign unique numbers (sequentially) to each weekday during your sampling season, then use the random number generator (e.g., in Excel) to create 10 random numbers

Appendix 2: Suggested Documentation for 4 Points in the 10YWSC

Wilderness Name:

Classification: Type 1 ___ Type 2 ___ Type 3 ___

Describe rationale for classification:

How were use zones established?

Describe any modifications made to the protocol:

Monitoring season: Begin date: _____ End date: _____

How were monitoring dates selected?

Were any additional data collected?

Monitoring Areas

Opportunity Class, Use Zone	Monitoring Area	Reason for Selection

How were data entered and analyzed?

Appendix 3: Checksheet for Implementing Minimum Protocol for Monitoring Encounters (10YWSC Element 5)

Prior to data collection:

- Verify classification of wilderness as Type 1, 2, or 3, and adjust if necessary
- Review plans and policies to identify any existing indicators and standards related to encounters. Adjust monitoring protocol as necessary for local indicators.
- Identify opportunity classes or establish use zones for your wilderness.
- Select monitoring areas for each opportunity class/ use zone except the lowest use zone.
 - consider where patrols are needed for other purposes
 - consider whether you want to use areas that are “typical” or suspected to be at the “threshold”
 - clearly define the geospatial boundaries for each monitoring area
 - choose monitoring dates, considering whether you need a random sample or can use a convenience sample
- Decide if you want to collect any additional data beyond what is required in the protocol
- Prepare field data forms

Collect data:

- Train staff in monitoring protocol and data collection
- Review data when collected, especially at the beginning, to ensure accuracy and completeness

Data entry and analysis:

- Create spreadsheets for data entry
- Enter data into spreadsheets
- See minimum protocol for guidance about summarizing data

Document decision process and monitoring details

- Complete suggested documentation

Appendix 4: **Guidance for establishing use zones for the minimum protocol**

If wilderness opportunity classes (WROS classes) have not been mapped for your wilderness, you will need to establish use zones. The zones established for this protocol are created solely for the purposes of monitoring opportunities for solitude, and they reflect current use levels, not long-term management goals for the area. The process to establish use zones may require consulting field staff and (for wildernesses shared by multiple units) managers from other districts or forests. The process of discussing, justifying, and documenting these zoning decisions and selecting monitoring areas may take up to two days.

- Because most visitation is concentrated on trails, most of the wilderness that is more than about $\frac{1}{4}$ mile from trail will be classified as “low use” and not be monitored. In larger wildernesses, most use occurs within 6-8 miles of a trailhead or other access point, so interior areas are likely to be classified as “low use,” even if they have trails. Thus, in many wildernesses, the majority of the land will be designated in the lowest use category. Encounter monitoring will not be done in these areas.
- Most wildernesses have only a few very high use zones, and these are usually key attractions with high levels of day use.
- It often makes sense to break zones at natural locations where visitation intensity changes, such as at a trail junction just past a major destination site.
- Zones generally should be large enough to accommodate 4 hours of monitoring – for instance a 2-mile segment of trail to a large lake could be a single zone.

Each wilderness will have between 2 and 4 categories of zones.

- All wildernesses are expected to have a “low use” zone, where it would be uncommon to encounter any visitors on any given day.
- Beyond the “low use zone,” the number of use categories will depend on the intensity and variation of use across a wilderness. In many wildernesses it will be appropriate to have four categories: low (pristine, or trailless), moderate use, high use, and very high use. However, some low use wildernesses may have only two use categories, low and moderate. Some wildernesses may have three use categories.