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BEST PRACTICES FOR COLLECTING ONSITE DATA TO ASSESS RECREATIONAL USE IMPACTS FROM AN OIL SPILL

TECHNICAL DOCUMENTATION

Department of Commerce
National Oceanic and Atmospheric Administration (NOAA)
National Ocean Service
Office of Response and Restoration
Silver Spring, Maryland
March 2017

NOAA's Office of Response and Restoration

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- Determines damage to natural resources from these releases.
- Protects and restores marine and coastal ecosystems, including coral reefs.
- Works with communities to address critical local and regional coastal challenges.

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BEST PRACTICES FOR COLLECTING ONSITE DATA TO ASSESS RECREATIONAL USE IMPACTS FROM AN OIL SPILL

Technical Documentation

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Forward

On April 20, 2010, 41 miles off the coast of Louisiana in the Gulf of Mexico, an explosion and subsequent fire aboard the Deepwater Horizon drilling rig led to the largest offshore oil spill in United States history. During the following three and one-half months, oil flowed out of the well, through the waters of the gulf, and onto beaches, marshes, and other types of shoreline from Texas to Florida. Federal and State natural resource trustees engaged in a natural resource damage assessment (NRDA), as provided for under the federal Oil Pollution Act of 1990, to document the environmental harm and ultimately restore the Gulf of Mexico and compensate the U.S. public for the interim losses caused by the spill. Trustees have led NRDAs over the years on numerous other oil spills, but never at a level of effort, intensity, nor scale demanded by the Deepwater Horizon (DWH) incident.

An integral component of most NRDAs is the assessment of lost recreational use opportunities to the public. For the Exxon Valdez (1989), American Trader (1990), Tampa Bay (1993), Chalk Point (2000), Buzzards Bay (2003), and Cosco Busan (2007) spills (among others), trustees have used data on recreational use to estimate lost value and implement restoration projects to compensate the public. The DWH incident provided an unprecedented challenge to develop and implement procedures to survey recreational users of natural resources over a vast area and for an extended period.

Shortly after the spill, NOAA, in coordination with other state and federal trustees, implemented a study that utilized aerial overflights and hundreds of infield interviewers, photo counters, data entry staff, programmers, economists, survey research experts and statisticians. During the three-year study, staff members processed more than 497,000 aerial photographs and infield teams interviewed over 128,000 individuals at recreational sites along the Gulf from Louisiana to Florida. This study was designed to be rigorous, comprehensive, and defensible from a litigation standpoint. An external audit performed on the data collection process, after-the fact, showed that the intensive quality assurance and quality control procedures in place delivered a dataset with a statistically zero error rate. This study, along with the rest of the NRDA, helped secure the largest monetary settlement ever reached with a single entity in the United States. The settlement funds are being used in the restoration of the injured natural resources of the Gulf of Mexico to the benefit of generations to come.

The DWH infield study serves as an impressive model for measuring recreational use. This procedures manual builds off the processes and lessons learned from the DWH NRDA and is designed to serve as a guide for any public agency or private organization interested in measuring recreational use at shoreline areas, fishing sites, and boat ramps. Our goal is to provide a guide that if followed, can provide reliable and defensible estimates that can inform policy, planning, or NRDA case decisions.

Our sincerest gratitude goes to the authors and expert reviewers of this manual: Eric Horsch, Michael Welsh, Jason Price, Eric English, and Roger Tourangeau, as well as to all the experts and contractor staff who played a critical role in the DWH lost recreational use assessment, including but not limited to Nathan Braun, Mike Brick, Pat Brick, Belinda Davison, Fiona Garvin, Michael Hanemann, Joseph Herriges, Heather Hosterman, Nicolai Kuminoff, Christopher Leggett, Frank Lupi, Jacqueline Mills, Kenneth E. McConnell, Craig Mohn, Jean Opsomer, Stanley Presser, Juha Siikamaki, V. Kerry Smith, Justin Stein, Christopher Timmins, Roger Tourangeau, Sophie Tyack, Roger von Haefen, Carolyn Wagner, Jacqueline Willwerth, and Jeffrey Wooldridge.

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1. Introduction

In the aftermath of an oil spill, state and federal natural resource trustees ("Trustees") often need to assess impacts to recreational use as part of a Natural Resource Damage Assessment (NRDA). A lost recreational use assessment—one component of a broader "Human Use" assessment that can also include financial, cultural, and subsistence losses—measures losses to the public due to a reduced ability to interact with Trust resources. For spills affecting coastal areas, this often means reduced recreational fishing, boating, beach use, and other activities along the coast (e.g. birdwatching, diving, and hunting). For these assessments, data are needed to estimate changes in the amount of recreation at sites potentially affected by the spill. Actual use levels during the spill and the period of recovery ("spill period use") are compared to use levels that would have occurred if not for the spill ("baseline use") to determine the change in use. In some cases, existing data sources alone are insufficient to conduct the assessment, and new data must be collected.

This manual provides guidance to Trustees (and responsible parties ("RPs") in the case of "cooperative assessments") on the relevant methods and considerations for collecting data for recreational use assessments. While a range of methods may be used, this manual focuses only on onsite data collection using ground personnel and aerial photography. Other methods that may be considered but are not discussed in this manual include mail, telephone, and internet surveys; automated vehicle or people counters; and roving or fixed-point ground photography (see Leggett, 2015). This manual provides several examples, both to illustrate the application of different approaches and to provide ideas and templates for future data collection efforts. The examples cover a range of activities, including general beach recreation (swimming, sunbathing, etc.), shore-based fishing (i.e., saltwater fishing not occurring on sandy beaches), and boating (including pleasure boating and boat-based fishing).

The chapters in this manual address all the necessary steps for onsite data collection: sampling design, developing data collection materials, study implementation (e.g., staffing logistics and safety), field data intake and review, and data entry and processing. This and other important information for onsite data collection is organized into the following chapters:

- **Chapter 2 Sampling Methods and Design** provides background on sampling design. Topics include a discussion of two general data collection methods—interval counts and instantaneous counts—and procedures for creating a sampling plan.
- **Chapter 3 Onsite Data Collection Using Ground Personnel** provides guidance on a range of issues related to data collection using ground personnel, including the development of data collection materials (e.g., protocols and datasheets) and staffing logistics (e.g., hiring and training, scheduling, and supporting and monitoring staff during data collection).

- **Chapter 4 Onsite Data Collection Using Aerial Photography** addresses the use of aerial photography for collecting onsite data on recreational use. The chapter includes a discussion of the advantages and disadvantages of this method and guidance on implementing it, including development of data collection protocols, logistics, and managing the inflow of photographs.
- **Chapter 5 Safety Considerations for Data Collection** provides guidance on developing a safety plan and safety training requirements.
- **Chapter 6 Data Entry and Processing Procedures** provides guidance on procedures for entering and processing data in preparation for analysis.
- **Chapter 7 Litigation Considerations** addresses several litigation-related topics that may be relevant for data collection, including document retention, chain of custody documentation, secure storage of assessment materials, handling of electronic communications, confidentiality, and independent third-party verification of the data collection effort.
- **Chapter 8 Putting It All Together** summarizes the topics covered in this manual and highlights the key steps necessary to prepare for and implement an onsite data collection effort.

The content of this manual draws from our experience assessing the effects of the Deepwater Horizon (DWH) oil spill on recreation in the Gulf of Mexico (DWH Trustees, 2016), as well as other assessments. Although technological advances are likely to affect future damages assessments—for example, onsite data collection might use tablet or smartphone applications rather than paper data collection forms—the methods described in this manual illustrate current best current practices for assessing lost recreational use.

2. Sampling Methods and Design

In most cases, collecting recreational use data at the full universe of sites and times during the assessment period is not possible due to costs and staffing logistics. Therefore, it is customary to draw a sample of sites, days, and times from the frame of interest using probability sampling. If designed carefully to yield a representative mix of these dimensions, the sample data can be extrapolated to estimate recreational use for the full frame. To support the discussion of sampling methods, the first section of this chapter provides background on two general data collection methods—interval counts (i.e., counts of entries or departures over a fixed interval) and instantaneous counts—and discusses considerations for choosing between them. The second section of this chapter describes procedures for multi-stage sampling, which can be applied to both interval and instantaneous counts. Examples of multi-stage sample designs are included in Appendix A. The methods described represent best practices, though there may be resource constraints leading some studies to deviate from these best practices. The third section of this chapter provides considerations for ensuring a sampling design is compliant with federal, state, and local environmental laws and regulations. To summarize the topics covered in this chapter, we conclude with a checklist of items related to sampling methods and design.

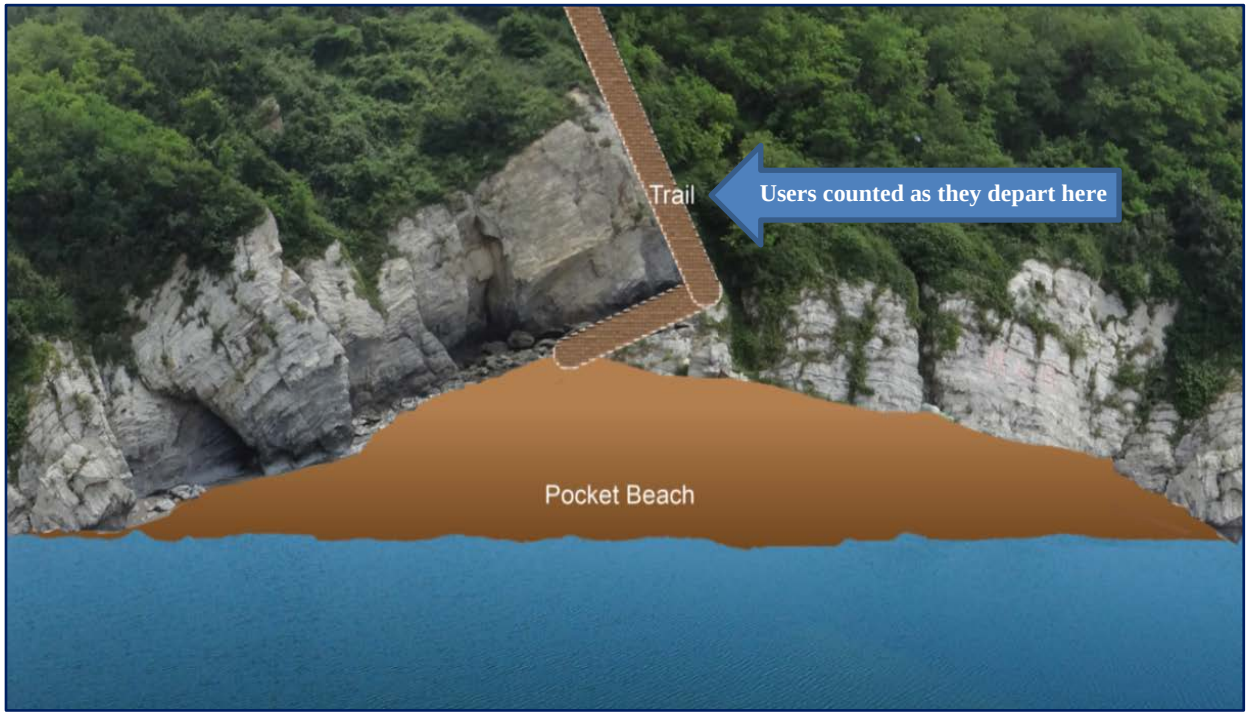
2.1 Overview of Data Collection Methods

Interval counts involve counting recreational visits during a period (i.e., interval) of time, either as people arrive at or depart from a site. For example, beach users could be counted over a full day as they leave a pocket beach via the single trail leading down to it from a bluff (Exhibit 2.1). The number of users departing is the estimate of total visits for a single day.

Considerations

- **Multiple departures by an individual:** Since some visitors may leave the pocket beach more than once during the day (e.g., to take a lunch break), it may be necessary to administer a brief intercept survey as people leave the site to identify unique departures. For example, field staff could ask, “Are you leaving this site for the day?” If the respondent says “Yes”, he or she is counted as a unique departure. If the respondent says “No”, he or she is not included in the final count of unique departures. Additional information may be collected at the time of the intercept that may be used to characterize the respondent (e.g., home ZIP code) and the purpose of the visit (e.g., activities engaged in while at the beach).

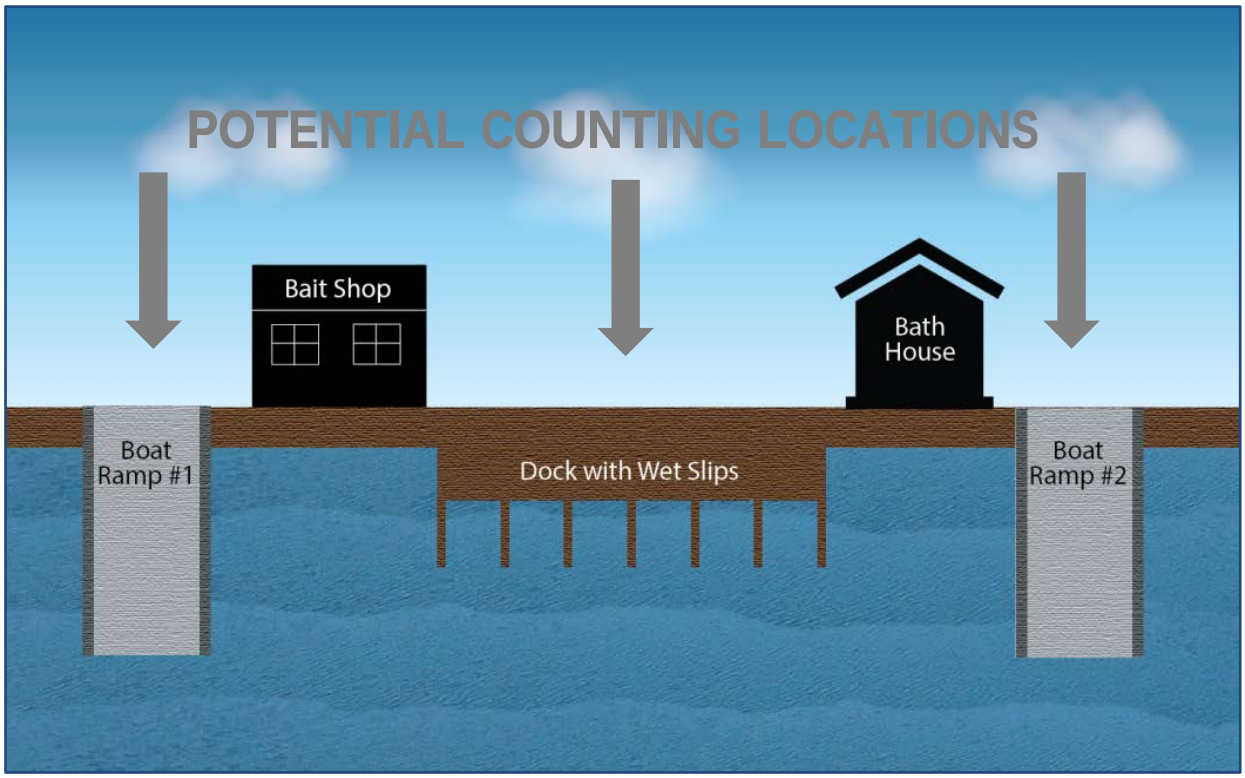
Exhibit 2.1. Single Access Point Pocket Beach



- **Multiple access points:** Sites with multiple access points may also be monitored using interval counts. For example, a coastal boating site may have two separate boat ramps and a dock with wet slips from which boats can depart (Exhibit 2.2). In this case, the two boat ramps and dock may not be visible to just one observer. Instead, three observers may be needed to monitor departures (or arrivals) from all three departure points. Alternatively, the access points themselves could be sampled and monitored at different times (Leggett, 2015). At some marinas, the task of monitoring multiple departure points can be simplified if all boats pass through a "choke point" to enter or exit the site.
- **Party size:** Since the counting unit in Exhibit 2.2 is boats rather than individuals, the departure interview may also include a question about party size (i.e., the number of people departing on the boat). This would also apply at sites where the counting unit is cars.

Instantaneous counts involve counting recreational visitors within a designated area at a specific point in time. These can be conducted by ground personnel over a matter of minutes or by aerial overflights over a matter of seconds (depending on the speed of the aircraft). While the time scale for counts conducted on the ground is generally longer than for overflights, both approaches would be described as "instantaneous counts". The instantaneous count method is particularly useful for sites with diffuse access, such as an open beach segment with an adjacent sidewalk (Exhibit 2.3). For this type of site, conducting interval counts would be nearly impossible because there is no set of defined access points through which people enter or leave the site.

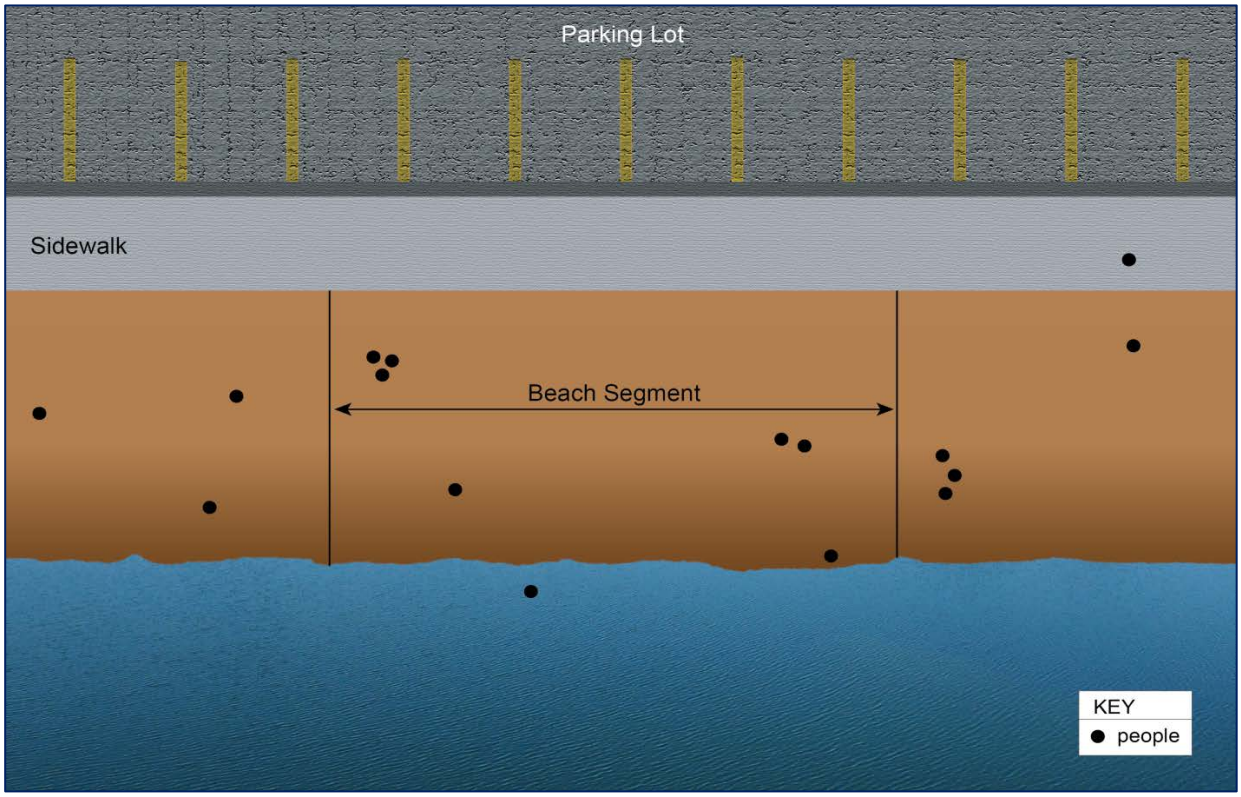
Exhibit 2.2. Multi-Access Point Boating Site



The estimation of user days is more complex for instantaneous counts than for interval counts. To calculate total use at the site for a given day, the count is multiplied by the number of hours in the sampling day and divided by an estimate of the average number of hours per visit (Pollock et al., 1994; Leggett 2015; Tourangeau and English, 2015).[1] The number of hours for a given visit, or visit duration, determines the probability that a user at the site was present when the instantaneous count was taken, and is used in calculating the average duration. Durations data (e.g., arrival time and expected departure time) can be collected by intercepting a sample of recreators on the beach and conducting a short interview with them. Additional information may be collected at the time of the intercept, as described above for interval counts.

[1] If multiple counts are obtained at different times of day, it is customary to use the average of the counts.

Exhibit 2.3. Diffuse Access Beach Site



Choosing Between Counting Methods

It may be appropriate to use a mixture of the methods described above and to create separate sampling designs, one for sites where interval counts will be conducted and one for sites where instantaneous counts will be conducted. There are several factors to consider when choosing between these two approaches, including:

- **Type of access**: Interval counts are straightforward to implement when sites have well-defined access points. This could include parks or beaches with specific points of entry, or coastal areas where boats enter the water from boat ramps or marinas. For sites with diffuse access, such as beaches adjacent to hotels and developed residential areas, instantaneous counts are generally preferable.

  Type of visitation: Shore-based recreation can be enumerated using interval and instantaneous counts, but water-based recreation originating from coastal sites is often counted using interval counts. While a boat is in the water, it can be hard, if not impossible to observe since it can potentially travel a great distance from shore. Rather than counting boats on the water, a useful alternative is to count boats as they depart or return to a launching area.

- **Sampling effort:** Interval counts require a high level of effort relative to instantaneous counts for a given target sample size of people and sites. One person conducting instantaneous counts may be able to sample 10 or more beaches and interview hundreds of people in a day. Personnel conducting interval counts must

remain at one site for an extended period and may spend considerable time waiting for visitors to arrive or depart.

- **Uncertainty in estimation:** Instantaneous counts entail uncertainty with respect to the use of visit durations during estimation (durations add an additional source of variability to the estimate of recreational use). Further, durations are usually estimated by survey respondents rather than observed. Interval counts entail uncertainty if high traffic at an entry point prevents interviewers from accurately determining who is leaving or returning multiple times.

Once a method, or mix of methods, has been chosen, a sampling plan must be created and implemented. Section 2.2 provides guidance on creating a sampling plan, while Chapters 3 and 4 provide guidance on implementing data collecting using ground personnel and aerial photography.

2.2 Sampling Design

This section addresses common approaches for drawing a probability sample for data collection. We provide example sampling plans in Appendix A for conducting interval and instantaneous counts.

In theory, recreational use data could be collected at all sites of interest on all days and times. In practice, data are usually collected on a subset of days and times, and sometimes at a subset of sites. Each site-day-time combination when a count could be conducted is known as a sampling unit. The collection of all sampling units is known as the sampling frame. The process of drawing a sample involves selecting a subset of sampling units from the frame.[2] **A sampling plan is a list of sites, days, and times describing where and when data will be collected**. Each row of the sampling plan represents a unique sampling unit (also called a sampling event).

Multi-Stage Sampling

The least complex sampling approach is to employ **simple random sampling**. With this approach, every sampling unit in the frame has an equal probability of being selected, and one simply decides how many units will be drawn into the sample. A sample can be drawn "with replacement" or "without replacement". "With replacement" sampling means the selected sampling unit from a given draw has a chance of being sampled again on the next random draw. "Without replacement" means the selected sampling unit from a given draw is set aside after it has been selected. Because sampling without replacement ensures that each sampling unit is selected at most one time, it is customarily used for recreational use sampling designs

One drawback of simple random sampling is that the information collected can be highly unbalanced. For example, suppose the sampling frame includes two boating sites (e.g., Sites A and B), all days of the week, and two shifts on a given day (e.g., 8:00 am to 2:00

[2] After data collection is complete, it is best practice to weight the sample obtained so that it reproduces the frame (see Leggett (2015) and Tourangeau and English (2015) for a discussion of weighting and estimation methods).

pm and 2:00 pm to 8:00 pm). A simple random sample could result in selecting only weekdays from 8:00 am to 2:00 pm at Site A. The information could be useful for understanding boating use at Site A on weekdays from 8:00 am to 2:00 pm, but it would not provide information about use during other weekday times or on weekends at Site A, or about use at Site B.

This problem can be addressed with **multi-stage sampling**, a common approach for collecting recreational use data, where the dimensions of a sampling unit (defined by sites, days, and times) are selected in separate stages, and sometimes with differing probabilities. The dimensions may be selected at each stage using simple random sampling or another sampling approach (e.g., stratified sampling, cluster sampling, systematic sampling).[3] The use of stratified sampling is emphasized in the following sections because it reduces the variance on the recreational use estimate by ensuring that the sample is representative of different areas, time periods, and times of day.

Sites

A common first stage of sampling, **site selection**, involves the selection of sites where data collection will occur.

- The probability of selecting each site into the sample need not be uniform. For example, if the approximate relative intensity of recreational use across the sites of interest is known in advance, high-use sites may be selected with higher probability. This approach reduces the variance on the final estimate of use across all sites, since high-use sites provide disproportionately more information about total use. Additionally, it reduces the cost of collecting data, since some low use sites would be excluded from data collection. There are at least two approaches to selecting high-use sites with greater probability: 1) systematic probability-proportional-to-size (PPS) sampling (see Tourangeau and English, 2015) and 2) stratifying sites into low, medium, and high use and selecting a greater number of sites from strata with high use. If existing information about use at the sites of interest is limited, all sites should be drawn into the sample with equal probability.
- If the selected sites are too numerous to sample in a given period with available resources, a subset of sites may be selected for different time periods. For instance, if it is possible for survey teams to visit only half of the sites each week, the sites could be divided into two groups, perhaps based on proximity, and one group of sites could be randomly selected for one week and the other group for the following week. This approach could be repeated for each two-week period during the study.

Returning to our previous example, assume Boating Sites A and B represent the spatial frame of sites where interval counts will be conducted (e.g., the oil spill was local and likely only affected these two sites). Let us also assume that there is no existing information about use at these sites and that we have sufficient resources to sample both sites during

[3] See Leggett (2015) for an overview of these different sampling methods.

all time periods. In this case, both sites would be selected from the frame into the sample for all time periods.

Days

The second stage of sampling, **day selection**, involves the selection of days on which data collection will occur at each site in the sample. It is customary to stratify the sampling of days by weekend/weekday and by some fixed time period, such as a two-week period or month. Days are stratified by weekend/weekday because recreational use is usually higher on weekend days (e.g., Saturday and Sunday), and the error can be reduced on the final use estimate by sampling a higher fraction of weekend days.[4] Days are stratified by time period, such as months, because use levels are likely to vary throughout the year and all times of year should be adequately represented.[5] Additionally, Trustees may require estimates for a particular time period. A six-month long assessment without any time strata may result in observations that are concentrated too much at the start and end of the study. Therefore, stratification ensures that data collection is spread out and occurs during a representative set of sub-periods.

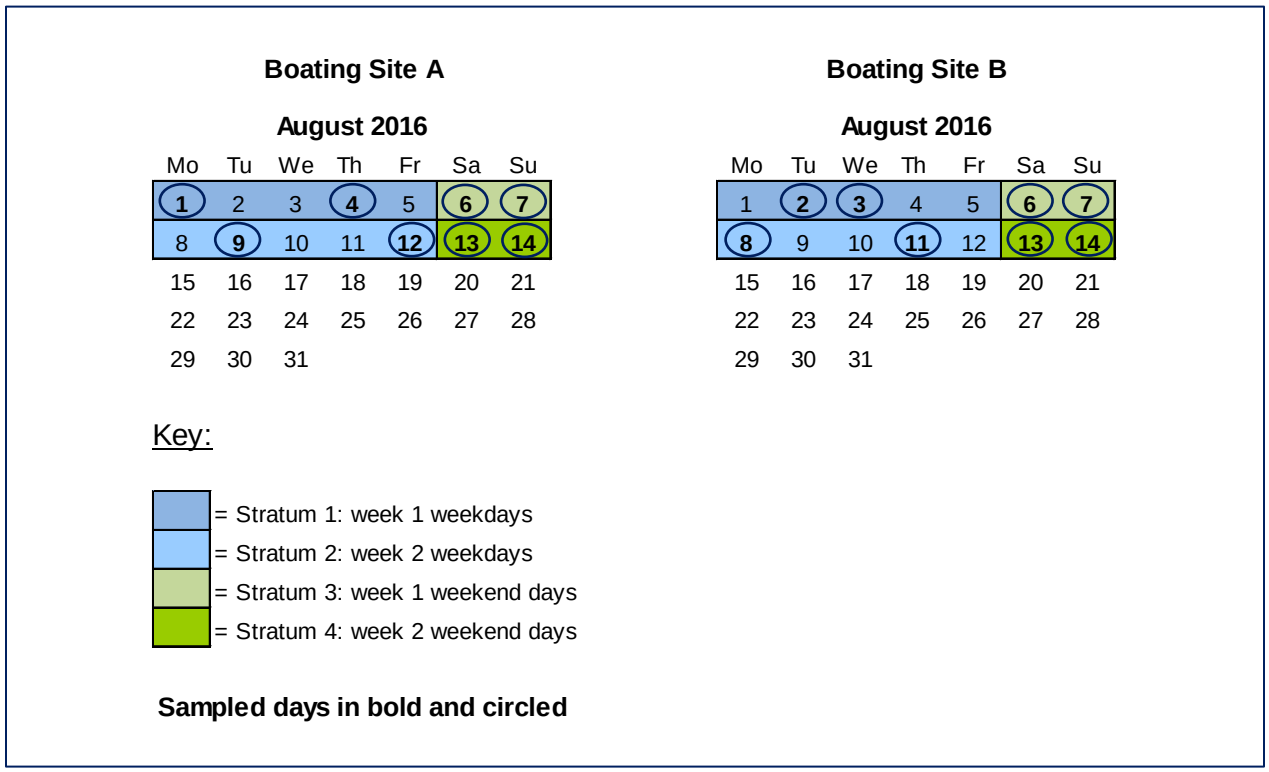
- Returning to our example of interval counts at Boating Sites A and B, we first define the time period of interest (i.e., the temporal frame): a two week period from 8/1 – 8/14/2016. Within that time period we stratify by weekday and weekend day (Monday through Friday are weekdays and Saturday and Sunday are weekend days). For each site, we select four weekdays and four weekend days for sampling during the two-week period. Further, we stratify the two-week period by week so that two weekdays and two weekend days are selected each week. Finally, we select the days of week without replacement. The resulting sample is balanced and represents the two weeks, as well as both weekdays and weekend days within each week. Exhibit 2.4 shows the four strata and selected days within each stratum for each site. Because the first selected weekday for Boating Site A was a Monday, the other Monday in the two week period was not considered for the remaining three selected days. All four weekend days were selected with certainty in the two-week period.
- For instantaneous counts using ground personnel, sites are often organized into loops for data collection. This increases efficiency since multiple instantaneous counts are usually collected in a day, and drive times can be minimized if sites are grouped into loops based on proximity. For example, if the area of interest is a continuous stretch of beach about 200 miles long, the beach could be divided into segments (e.g., about one mile in length) using visible boundaries such as piers or buildings. The resulting segments could be organized into loops of adjacent sites (e.g., groups of six adjacent

[4] Depending on the site, Friday use may be more similar to Saturday and Sunday use than other weekdays. In these cases, Friday may be considered a weekend day. Similarly, holidays may be considered weekend days.

[5] While stratification by time period may partially account for variation in weather, the final sample will likely be unrepresentative of weather for the frame because inclement weather reduces the probability of successfully collecting data. For this reason, weather may need to be accounted for when estimating total use (see Tourangeau and English, 2015).

sites).[6] Data collection using ground personnel could be conducted at sites in one or more of these loops on a given day, where the sampling times for each site are spread across the sampling day. Thus, the second stage would involve selecting days for data collection at sites making up a given loop. If aerial photographs are also collected, overflights of all sites could be conducted on the same days as ground data collection. This serves to coordinate the information collected on the ground and in the aerial photographs. Appendix A presents a detailed example for instantaneous counts.

Exhibit 2.4. Illustrative Sampling Design Strata, Interval Counts



Times

The third and final stage of sampling, **time selection**, involves the selection of times at which data will be collected for each site-day combination in the sample. The purpose of this stage is to designate a range of times (e.g., shifts for interval counts and count times for instantaneous counts) throughout the sampling day so that within-day variation in use is captured by the sample. The selection of times is usually done at the site level and within any strata designated in a previous stage (e.g., week one weekdays).

[6] Depending on the final number of segments in this example, some groups may have fewer or more than six sites. Generally speaking, the number of sites in a loop can be adjusted as needed given logistical constraints.

- A simple approach for dividing the daily frame into sampling units for interval counts is to designate multiple shifts across the sampling day. Consider again the example from Exhibit 2.4. We use a sampling day of 12 hours to represent the approximate daylight hours in early August and divide it into two six-hour shifts at each site. Within each of the four strata, shifts are selected randomly for each site without replacement, resulting in each shift being represented once per stratum. For example, one early shift and one late shift are selected for each boating site for the weekday observations in the first week. Exhibit 2.5 presents the sampling plan for Boating Sites A and B using a multi-stage sampling approach.

Exhibit 2.5. Illustrative Sampling Plan, Interval Counts

DATE	DAY	TIME	SITE
8/1/2016	Monday	8:00 am to 2:00 pm	Boating Site A
8/2/2016	Tuesday	2:00 pm to 8:00 pm	Boating Site B
8/3/2016	Wednesday	8:00 am to 2:00 pm	Boating Site B
8/4/2016	Thursday	2:00 pm to 8:00 pm	Boating Site A
8/6/2016	Saturday	8:00 am to 2:00 pm	Boating Site A
8/6/2016	Saturday	2:00 pm to 8:00 pm	Boating Site B
8/7/2016	Sunday	8:00 am to 2:00 pm	Boating Site B
8/7/2016	Sunday	2:00 pm to 8:00 pm	Boating Site A
8/8/2016	Monday	2:00 pm to 8:00 pm	Boating Site B
8/9/2016	Tuesday	8:00 am to 2:00 pm	Boating Site A
8/11/2016	Thursday	8:00 am to 2:00 pm	Boating Site B
8/12/2016	Friday	2:00 pm to 8:00 pm	Boating Site A
8/13/2016	Saturday	8:00 am to 2:00 pm	Boating Site A
8/13/2016	Saturday	2:00 pm to 8:00 pm	Boating Site B
8/14/2016	Sunday	8:00 am to 2:00 pm	Boating Site B
8/14/2016	Sunday	2:00 pm to 8:00 pm	Boating Site A

- For instantaneous counts, a sampling day may be divided into a discrete set of times (e.g., one count every hour). As discussed above, instantaneous counts using ground personnel are often conducted at a set of sites organized into a loop. The start times for sites in a loop are usually spread apart by some fixed amount of time (e.g., one count every two hours) or based on the travel times between specific sites if these are highly variable. For example, the count times for a pair of sites in close proximity may be scheduled close together, while the gap between count times for another pair of sites that are far apart (e.g., on opposite sides of a bay) may need to be longer. The distance between sites should be considered when designating the loops in the previous stage. The start times for a particular day may be determined by randomly selecting the start site in the loop. So long as the sites in the loop are always sampled in the same order, the sites will be sampled at different times of day across multiple days in a stratum. The sample remains as balanced as possible when the start site is selected without replacement within each stratum.
- For instantaneous counts using aerial photography, the start time and direction of an overflight can be randomly selected within each stratum to ensure geographic and

temporal variation in the sample. If a flight covering all sites takes an average of four hours to complete, the start times may range from 8:00 am to 4:00 pm (e.g., 8:00 am, 9:00 am, ... 4:00 pm) to ensure complete coverage of a 12-hour sampling day from 8:00 am to 8:00 pm. Further, the start direction may be randomized between the two ends of the route, creating twice as many combinations. An alternative to this approach would be to break up the flight route into sub-segments with separate starting points and times to create additional variability in the times when counts are conducted at different sites (see Pollock et al., 1994).

Potential Logistical Constraints

A number of logistical constraints may affect the selection of sampling units or the implementation of the sampling plan. They include the following:

- **Minimum team sizes:** Minimum team sizes (e.g., two people per data collection team) may be required to support safe data collection, even if only one person is needed to collect the necessary data at a site.
- **Maximum daily and weekly sampling and working hours:** Hours may be capped to promote safety and to enhance data quality. Exhibit 2.5 above shows two shifts (i.e., 8:00 am to 2:00 pm or 2:00 pm to 8:00 pm). If field staff are permitted to work a maximum of 8 hours per day, two separate teams of staff would be required to cover days with multiple shifts (e.g., 8/7/2016).
- **Travel times between sites**: The sampling times must be scheduled far enough apart to allow sufficient time for collecting data at a site and for getting to the next site. For example, since there is likely to be some travel time between Boating Sites A and B, two separate field teams would be needed to fulfill the sampling plan on days when the two sites are sampled back-to-back (e.g., 8/7/16 in Exhibit 2.5).
- **Changing daylight hours during the assessment period:** In most assessments, data are collected only during daylight hours. The daily sampling frame used in Exhibit 2.5 is 8:00 am to 8:00 pm, which reflects August daylight hours for most U.S. locations. However, the sampling frame would likely need adjustment during winter months. For example, two five-hour shifts may be used: 8:00 am to 1:00 pm and 1:00 pm to 6:00 pm.

Appendix A provides example sampling plans for conducting instantaneous counts at shoreline use sites and interval counts at boating sites. The example sampling plan for shoreline use sites can also be used for conducting instantaneous counts at shore fishing sites with slight modifications. These examples demonstrate how a sampling plan may be created for a future spill and should be modified according to the needs of the study. Due to the technical nature of sampling design and estimation of user days from the resulting data, we recommend that study teams include a statistician on the project team. The statistician could lend expertise on identifying the frame, dividing the frame into sampling units, selecting a data collection approach, designing a sample, and estimating recreational use from the data collected (see Leggett (2015), Lohr (1999), and Cochran (1977) for a full treatment of multi-stage sampling designs and formulas for estimating use from the data collected).

2.3 Environmental Compliance

Be advised that there are a number of federal, state, and local laws and regulations that you need to take into consideration when developing your sampling design. Each law has requirements, such as permits, authorizations and consultations, which you may need to comply with depending on the nature of your action. In addition, federal, state, and local agencies may have specific processing requirements, including, in many cases, timelines with emergency situations. Please note that several federal agencies (e.g., U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, NOAA) have jurisdiction over federal laws. The following are examples of relevant federal laws:

- Clean Air Act,
- Clean Water Act,
- Coastal Zone Management Act,
- Endangered Species Act,
- Marine Mammal Protection Act, and
- National Marine Sanctuaries Act.

2.4 Sampling Methods and Design Checklist

Below is a checklist to consider with items related to sampling methods and design. The checklist is meant to be used as a guide, rather than a list of required items.

- Consider advantages and disadvantages of interval and instantaneous counts and select appropriate method(s)
- Create a sampling plan with the following dimensions:
    - Sites
    - Days
    - Times
- Ensure sampling design is compliant with federal, state, and local environmental laws and regulations

3. Onsite Data Collection Using Ground Personnel

This chapter covers a range of issues related to collecting data using ground personnel, with a focus on logistical and management considerations. We begin the chapter with guidance on developing data collection materials, including protocols and datasheets, and provide examples that can be used as a template for future efforts. The subsequent section focuses on staffing logistics, including hiring and training, scheduling, supporting and monitoring staff during data collection, and safety while in the field. Our focus on safety is brief here as Chapter 5 provides a full treatment of the issue. The third section describes methods for managing the inflow of datasheets and conducting initial reviews to ensure completeness and adherence to data collection protocols. To summarize the topics covered in this chapter, we conclude with a checklist of items related to data collection using ground personnel.

3.1 Developing Data Collection Materials

Data collection materials serve as instructions to field staff and document all procedures. While oral training prior to and during the study will likely supplement these materials, we stress their importance as they will be part of the written record and thus can serve as a reference after the data collection is complete.

We divide this section into four parts:

- **General project instructions**, which define the broad themes of data collection and general procedures;
- **Data collection procedures,** which cover the protocols for specific types of data collection (e.g., interval counts and interviews);
- **Site-specific protocols**, which refine the data collection procedures at the site level; and
- **Datasheets**, which are used by field staff to systematically collect data.

While we address these four topics separately, they can be combined for a particular effort. For example, if data collection entails collecting data using a single method (e.g., interval counts and interviews) at a small number of sites that are highly similar in terms of site characteristics and types of use (e.g., a few separate fishing piers), the general project instructions, data collection procedures, and site-specific protocols could be combined into a single document. For larger efforts with greater complexity, it may be necessary to separate these items.

General Project Instructions

The general project instructions address the purpose of the project, basic requirements for collecting data, the composition of the study team, an overview of required materials and equipment, and other administrative details or general data collection topics that inform field staff how to complete their job on a daily basis.

Purpose of Project

The general project instructions often begin with a brief discussion of the purpose of the project. The purpose might be described as collecting information on the amount and type of recreational use at coastal locations. Field staff should be told that their job is to safely collect high-quality data in a professional and courteous manner.

The description of the project purpose should also include the following items:

- The range of recreational activities to be assessed, such as general beach recreation, shore-based fishing, and boating. Further, the geographic coverage should be described along with the types of sites where data will be collected (e.g., at sandy beaches, fishing piers, and public boat ramps).
- The timeline for the study.
- Description of the parties involved with the study, namely, a list of the Trustees, RPs that are cooperatively participating in the study, and any consultants. This generally fits into a discussion about the broader context for the study, specifically, that it is being conducted as part of a NRDA.
- A general overview of any applicable litigation-related requirements for the study, including conflict of interest, confidentiality, document retention, and chain of custody. These topics are covered in detail in Chapter 7.

Team Composition

The team composition may be described in terms of "Study Managers", "Field Supervisors", and "Field Staff".

- **Study managers** design and oversee the study, and may include select Trustees and senior members of their consultant team.
- **Field supervisors** are stationed in the field during data collection to manage and oversee field staff, and may include less-senior consultants.
- **Field staff** collect data and may include junior consultants or temporary staff from a staffing agency.

A list of contacts, including position title and telephone number, is appropriate to include in this part of the instructions.

Field Materials and Equipment

It is customary to provide staff with a list of required field materials and equipment, and specify who will provide the items. These items may include the following:

- Data collection materials (e.g., general project instructions, data collection procedures, site-specific protocols, and numerous blank datasheets);
- Field book (e.g., a "Rite in the Rain" notebook for recording project-related notes);
- Camera and photograph log (if taking photographs as part of data collection);
- Handheld counter;
- Box or folder for completed forms, other materials, and equipment;

- Clipboard and pen;
- Evidence tape and chain-of-custody forms;
- Safety plan and safety-related equipment (e.g., insect repellant, sunscreen, first-aid kit, cooler with cold water or other drinks, traffic safety vests, headlamp); and
- Study information handout with study manager contact information to give to members of the public, as needed, to reduce the burden on field staff of answering detailed questions.

Other Topics

Other topics that should be included in the general project instructions may be administrative in nature or general items related to data collection.

- **Scheduling:** Field staff need to know how to obtain the dates, locations, and times of their data collection assignments. This information can be provided via email, a shared web-based calendar, or as part of the general project instructions.
- **Reporting to work:** Study managers may want to meet with staff at a predetermined location (e.g., a hotel) prior to starting data collection each day or allow staff to start their day by simply reporting to the site 10-15 minutes prior to the beginning of their shift.
- **Professional conduct**: Expectations for professional conduct should be provided to staff. Generally speaking, staff can be encouraged to behave in a professional and courteous manner at all times throughout the study; to arrive at their work site on time and perform all assigned responsibilities to the standards required; to avoid using cell phones and texting during shifts other than for project-related communication and emergencies; not to discriminate based on race, color, national origin, religion, age, gender, sexual orientation, or disability; and to report to work free of the influence of drugs or alcohol.
- **Safety:** We encourage study managers to provide a separate safety plan (see Chapter 5), but the general themes, clothing and personal protective equipment requirements, and emergency contact information should also be provided in the general project instructions.
- **Corrections to datasheets:** Study managers will likely require all written documentation on datasheets to be legible. To meet this objective, staff should be instructed to use a non-erasable pen and not to erase or white-out any mistakes on a datasheet. If a mistake is made, staff can put a line through the text that needs to be corrected, write the corrected text next to the lined out text, and put their initials and date next to the correction.
- **Checking datasheets:** After collecting data at each site or at the end of a data collection day, field staff can help meet the goal of high data quality by checking their own datasheets and those of their partners for legibility and clarity. Errors identified that can be corrected (e.g., an incomplete circle around a response, a spelling error) should be addressed at that time. Note that some errors may not be reliably corrected after a data collection task is complete, such as forgetting to ask a question or to

record the response. For these cases, field staff should be instructed not to make any changes.

- **Handling and submission of completed datasheets**: Field staff need to know what to do with completed datasheets, and how and when to submit them. One approach is to have field staff keep completed forms with them at all times or in a locked location, such as the trunk of a car. At the end of the day or after a set number of days, field staff can personally give field supervisors their completed forms or mail them to a designated address in the general project instructions. If maintaining chain of custody is required for the study, study managers should provide specific direction on how to follow those procedures when submitting data.
- **Frequently-asked questions (FAQs):** As part of data collection, field staff will likely encounter questions about their work from potential survey respondents, members of the public, or other interested parties. The general project instructions can provide a list of FAQs and suggested answers to help staff address these questions. FAQs may include the following:
- **Q**: What are you doing?
    - **A**: I am collecting information about recreation at this site.
- **Q**: Who is this survey for?
    - **A**: I am working on behalf of [insert Trustee(s)].
- **Q**: How long will the survey take?
    - **A**: About [insert estimate] minute(s).
- **Q**: Will my responses be anonymous?
    - **A**: Yes. Your responses will be anonymous.
- **Q**: How will my responses be used?
    - **A**: Your responses will be used in a study being conducted by [insert Trustee(s)].

Sometimes members of the public will ask a field staff member for more details than the staff member is prepared to provide. In these cases the staff member should provide a handout with basic study information and contact information for an appropriate study manager or Trustee representative.

Data Collection Procedures

The documentation of data collection procedures serves as instructions for field staff on how data should be collected at a range of similar sites. For example, there may be a set of sites where instantaneous counts and interviews will be conducted and another set of sites where interval counts and interviews will be conducted. In this case, it is best practice to have two sets of procedures, one for each type of data collection. Additional procedures may be written to accommodate further variation in data collection. For example, instantaneous counts and interviews may be conducted at shoreline use and shore fishing sites, and separate procedures may be written for each activity. The site-specific protocols, described in the next section, modify these procedures as needed at the site level.

Appendix B provides example procedures for conducting instantaneous counts and interviews at shoreline use and shore fishing sites, and for interval counts and interviews at boating sites. These example procedures are meant to help study managers formulate how to write procedures for assessing the effects of a future spill, and hence should be modified according to the needs of the study. For example, shoreline use sites with a single entrance may allow for interval counts and interviews, and thus the procedures below, which assume multiple access points, would not be applicable.

Site-Specific Protocols

Site-specific protocols define how the data collection procedures are to be carried out at a particular site. These protocols convey the following information:

- Site name and number;
- Location of the site (i.e., coordinates) and how to get there;
- Point of contact at the site (e.g., marina operator);
- Site boundaries for data collection (e.g., schematic composed of a Google Earth image with overlaid sampling areas);
- Locations or walking routes for data collection; and
- Other site-specific details for data collection (e.g., locations where pictures should be taken).

These documents complement the data collection procedures by providing concise, site-level instructions about how data collection should occur at a specific site. Appendix C includes example site-specific protocols for conducting instantaneous counts and interviews at a shoreline site and a fishing site, as well as a site-specific protocol for conducting interval counts and interviews at a boating site. These can be used as a template for a future data collection effort and be modified to fit the specific needs of the study.

Datasheets

Datasheets, including count sheets and interview forms, are designed to collect information for estimating use (i.e., user days or trips) and any other information that is of interest to study managers (e.g., awareness of spill, perceived impacts of spill, and respondent origin). The necessary data points for each data collection method include the following:

- Instantaneous counts:
  - Instantaneous count of visitors;
  - Purpose of the visit (to separate recreational use from other uses); and
  - Visit duration (to convert the instantaneous count to an estimate of total visits).
- Interval counts:
  - Unique count of departures or arrivals over a given time interval;
  - Purpose of the visit (to separate recreational use from other uses); and
  - Party size (applicable if boats or vehicles are counted rather than individuals).

Study managers should consider the key data points listed above when designing datasheets. The datasheets may be hard copies or digital equivalents for use on a smart

phone or tablet. Appendix D includes example datasheets for conducting instantaneous counts and interviews at shoreline and fishing sites, and datasheets for conducting interval counts and interviews at boating sites. Appendix D also includes a description of all data fields on the datasheets. The count sheets include the instantaneous or interval count needed for estimating use. The shoreline use and fishing interview forms include a question about the purpose of the visit and questions that can be used to calculate visit duration (i.e., a combination of arrival time, interview time (not asked as a question, but recorded by the interviewer), and expected time remaining at the site). The boating interview form includes questions about the purpose of the individual's visit and party size.

3.2 Staffing Logistics

Once data collection materials have been developed, study managers can begin to staff and implement the study.[7] This section focuses on topics related to study implementation, including hiring and training of staff, scheduling, supporting and monitoring staff during data collection, and safety while in the field.

Hiring

For many spills, Trustees will require staffing support, which may be provided by a combination of Trustee consultants, RP staff and consultants (if it is a cooperative assessment), and labor from a staffing agency (also called a temp agency). Using temporary staff can provide a cost-effective staffing solution since most Trustees, RPs, and consulting companies do not have capacity to provide staff for labor-intensive efforts. For long-term efforts, it may be appropriate for contactors to hire additional permanent staff.

We recommend the following steps when hiring temporary staff for a data collection effort:[8]

- Clearly provide job requirements (i.e., travel to coastal locations, working outside, standing most of the day, etc.), as most staffing agencies are not familiar with staffing data collection efforts;
- Review resumes and conduct interviews, even if the staffing agency has a list of candidates they recommend;
- Conduct background checks;
- Conduct a conflict of interest review for all potential staff; and
- Obtain proof of car insurance if the study will require field staff to drive.

Training

While the data collection materials described in Section 3.1 may include everything field staff need to do their job, we strongly encourage study managers to host a training session for staff prior to data collection. For long-term efforts, trainings can be repeated on a fixed interval (e.g., every six months or annually). Below is a list of topics related to training:

[7] Note, revisions to data collection materials may be necessary after initiating the study, as field staff start to use these materials.

[8] These may be modified if the Trustees have specific acquisition regulations.

- **Training materials:** The data collection materials—general project instructions, data collection procedures, site-specific protocols, and datasheets—can serve as a guide for training. The general project instructions provide information on the study background, team members and their roles, materials and equipment and other administrative topics necessary for the job (i.e., obtaining the schedule, handling and submitting datasheets).
- **Training approach:** One approach is to use classroom-style training for the first half of the session and a site visit with example data collection during the second half. This approach provides study managers with an opportunity to cover the basics of data collection prior to visiting a site. Then, the site visit serves to cement the concepts covered in the classroom through "learning by doing". During the site visit portion of the training, study managers or field supervisors can demonstrate how to apply the site-specific protocols, and collect some example data using the datasheets. Field staff can then practice collecting data, including conducting interviews with each other.
- **Training checklist:** To ensure consistency of training across all staff, we encourage study managers to develop a training checklist that includes the list of items to be covered in training. If required by study managers, field staff should sign and date a confirmation page stating that training has been completed.
- **Supervisor training:** While the same people may serve as study managers and field supervisors, if separate people serve as field supervisors, they need to receive the same training as field staff plus training on any additional topics related to their role as a supervisor.

Scheduling

Study managers need to determine how to manage scheduling of field staff. For short-term efforts with few sites, staff assignments may be incorporated into the sampling plan without much challenge. For long-term efforts with many sites, scheduling can be more difficult. We recommend scheduling staff at least one week in advance so that they know their assignments ahead of time.

- **Creating the schedule:** A spreadsheet program, such as Microsoft Excel is a useful tool for scheduling. The sampling plan can be imported into the spreadsheet with sites in the rows and sampling dates in the columns. A study manager or field supervisor responsible for scheduling should then fill in staffing assignments in the grid. Field staff can be scheduled to work as close to their homes as possible to reduce drive times and study costs. The scheduler should also consider weekly maximum hours that staff may not exceed, cap the number of consecutive working days, and schedule staff to ensure sufficient downtime between shifts (e.g., 8 hours) when staff work on consecutive days. If data collection will be canceled on major holidays, the scheduler should incorporate that decision into scheduling. Maintaining excess staffing capacity (e.g., hiring one to two part-time flex field staff) can help mitigate schedule disruptions caused by unanticipated illnesses or field staff abruptly quitting.

- **Communicating the schedule:** As mentioned previously, the schedule needs to be clearly communicated to staff. This can be done via email, a shared web-based calendar, as part of the general project instructions, or by some other similar means. For long-term projects, the schedule may be released on a rolling basis as it is created. At a minimum, the schedule should include dates, times, and locations of staff assignments.

Supporting and Supplying Staff

The primary role of field supervisors is to support field staff in collecting data and to ensure that they have all the necessary data collection materials and equipment. After initial training is complete and staff are sent into the field with ample materials (e.g., numerous blank datasheets) and equipment, supervisors should check in periodically to resupply staff as needed. Field staff should also be encouraged to contact a field supervisor as their supply of materials or equipment diminishes.

Prior to and during data collection, field supervisors can support staff further by getting and maintaining permission from recreation site operators (e.g., a marina manager) to collect data at all sites. This may entail speaking with site operators and obtaining their permission and keeping them abreast of when field staff will be present at their sites.

Onsite Checks on Staff and Managing Staff Dismissals

In addition to supporting field staff, study managers and field supervisors typically take an active role in monitoring staff to ensure they adhere to all data collection and safety protocols. This oversight serves to maximize data quality and safety. The following steps should be considered:

- **Initial infield training:** During their first few weeks in the field, field supervisors should closely monitor staff. Supervisors can provide follow-up training, as needed, after observing field staff conduct counts and interviews. Material and equipment checks may also be conducted to ensure staff have all required items.
- **Ongoing field monitoring:** Even after field staff have settled into their positions and are familiar with all protocols and procedures, field supervisors can continue their oversight by making unscheduled visits at irregular intervals to observe field staff (possibly without them knowing). Follow-up training and feedback can be provided as needed.
- **Periodic Audits:** For long-term studies and/or efforts with high documentation requirements, study managers may conduct formal audits on a periodic basis (e.g., during a random week out of every ten or twelve weeks). Each audit could include a formal review of each field staff member to evaluate if he or she is following data collection procedures and has all the required materials and equipment.

In some cases, field staff may not be implementing protocols and procedures as required. These cases should be documented and the relevant data should be flagged when preparing the data for analysis (see Chapter 6). If possible, we encourage field supervisors to retrain staff on selected items and give them a chance to improve. If field staff do not improve within a reasonable timeframe or if they commit a clear violation of the protocols (e.g., showing up to work under the influence of controlled substances), they may need to be dismissed from the study. We encourage field supervisors to clearly document the reasons

for any termination, including the timeline of oversight and retraining (if applicable). This detailed documentation will allow people analyzing the data to evaluate if the data collected by terminated staff should be used.

Safety

Safety is paramount to a data collection effort and supersedes other data collection goals.[9] For most data collection efforts, field staff and supervisors are encouraged to actively evaluate potential safety hazards and consider potential mitigation actions, such as the use of personal protective equipment. Oversight of staff by field supervisors also serves to enhance safety. Since field supervisors cannot be present at all times, field staff can be provided with contact information and basic directions in the event of an emergency. If a safety plan is written for the study, study managers should review that as part of the classroom-style training described above.

3.3 Field Data Intake and Review

As field staff complete data forms and submit them to supervisors or study managers, a system will be needed to manage the inflow of datasheets and review them for adherence to data collection protocols. Field staff should be provided with feedback based on the outcome of these reviews. This step comes before data entry, a topic covered in Chapter 6. The system may be limited to review only if data are collected electronically (e.g., on a tablet).

One approach is to sort the datasheets by site, date, and time. To aid in data entry, a unique ID should be assigned to every datasheet after they are sorted. We recommend scanning all hard-copy data forms and storing them in a secure location for future reference. The scanned datasheets can be used for subsequent processing (i.e., datasheet review and entry).

The datasheet review can be conducted by field supervisors, or whoever serves as the data receiver, and may include checking the following elements:

- Handwriting on all forms is legible;
- Interviews were conducted according to study protocols (i.e., checking that responses were provided to all interview questions for which responses were expected);
- The correct sites were sampled at the correct times, as dictated by the sampling plan/schedule;
- All forms for scheduled sampling events were returned in a timely manner; and
- Other aspects of the protocols for sampling were followed correctly.

A random sample of datasheets should be selected for this review if reviewing all datasheets is not cost-effective. Any deviations from the data collection protocols should be quickly identified and communicated to field staff so that improvements are made. Supervisors

[9] A detailed treatment of safety topics is covered in Chapter 5. A brief discussion is included here to emphasize its importance.

should also follow up with staff during future data collection to ensure staff are correcting the issues communicated to them.

If maintaining chain-of-custody is required as part of the effort, staff should record the time and date that they relinquish their datasheets and the recipients of the data should record the time and date that they accept custody.

3.4 Ground Personnel Data Collection Checklist

Below is a checklist for to consider with items related to data collection using ground personnel. The checklist is meant to be used as a guide, rather than a list of required items.

- Develop data collection materials
    - General project instructions
    - Data collection procedures
    - Site-specific protocols
    - Datasheets
- Staffing logistics
    - Hire staff
    - Train staff
    - Support and supply staff
    - Conduct onsite checks
    - Retrain and dismiss staff as needed
    - Emphasize safety
- Field data intake and review
    - Develop data intake systems
    - Organize, number, and scan forms
    - Review forms and provide feedback to staff

4. Onsite Data Collection Using Aerial Photography

This chapter addresses the use of aerial photography for collecting onsite data on recreational use.[10] Counts from aerial photographs can be used in place of or to augment instantaneous counts collected using ground personnel. The basic approach for estimating use is to combine counts from aerial photographs with estimates of onsite durations from ground interviews or another source (e.g., available literature). We start this chapter with a discussion of the advantages and disadvantages of collecting aerial photographs for assessing recreational use. This discussion is meant to support study managers in deciding whether to conduct overflights to assess impacts from an oil spill. The second section provides guidance on developing data collection protocols for aerial photography. The third section focuses on logistics, including hiring and training, and safety while in the field. The fourth section describes methods for managing the inflow of aerial photographs and conducting reviews to ensure adherence to data collection protocols. To summarize the topics covered in this chapter, we conclude with a checklist of items related to data collection using aerial photography.

4.1 Considerations for Collecting Data Using Aerial Photography

The decision to collect aerial photographs depends on a range of factors, including the scope of oiling impacts (e.g., spatial and temporal), expected magnitude of the recreational use damages claim, and characteristics of the affected coastline (topography and vegetative cover). The decision will likely be straightforward in the case of very small or very large spills. For all spills in between, we offer the following advantages and disadvantages for study managers to consider.

Advantages

- Aerial surveys are an efficient and cost-effective way to collect data over a large geographic area (Pollock et al., 1994; Wallmo, 2003). A single pilot in an airplane can collect data over hundreds of miles in a few hours, while comparable on-the-ground data collection would require a large number of personnel, a long time, or both.
- Aerial photographs can capture areas out of reach to on-the-ground counters that may be of interest, such as gated pools and patios at beachside hotels or condominiums. Also, people in the water who are obscured to on-the-ground counters by waves or long distances are usually visible in pictures taken from the air.

[10] Aerial videography could be used instead of photography. While this chapter focuses on aerial photography, many of the topics discussed would also apply to videography.

- Aerial photography offers a simpler alternative to on-the-ground counts at densely populated sites with people on the move, as users are more easily counted in static photographs.
- The photographs provide lasting visual documentation for recreation data and the ability to reproduce counts to ensure accuracy.

Disadvantages

- Aerial surveys can be more expensive than ground data collection if the assessment area is small and/or the duration of the effects is short.
- Aerial photographs may exclude some people who would be visible from the ground (e.g., people under tree canopy), which can lead to an underestimate of use (Smucker, Lorantas, and Rosenberger, 2010). This is more likely to be a problem along wooded shorelines than on open beaches.
- Aerial surveys may not capture all targeted areas due to equipment failure or excessive flight speeds that can leave gaps between pictures (Volstad, Pollock, and Rickhus, 2006). Further, aerial surveys can be more sensitive to weather than on-the-ground sampling, which may also lead to gaps in data collection (Horsch et al., 2016). For example, ground personnel would likely be able to collect data in conditions that might prevent a plane from taking off, such as a rain shower or fog.
- Overflights are subject to logistical limitations, such as limited flexibility in the starting points and routes for the flights. This can lead to sampling times that are not completely random for any given sampled location (Pollock et al., 1994; Soupir, Brown, Stone, and Lott, 2006). This may affect the representativeness of the sample and require statistical corrections for estimating use (Horsch et al., 2016).
- Trustees and other study managers often do not have capabilities in-house to conduct overflights and collect aerial photography.[11] Therefore, an outside firm would likely be needed to perform overflight data collection.

The advantages and disadvantages provided above are based on past experience using manned aircraft (e.g., fixed wing airplanes, helicopters) to collect aerial photography. Emerging technologies, such as drones, and advances in satellite technology may affect the cost and efficacy of future aerial data collection.

4.2 Developing Aerial Photography Data Collection Protocols

If study managers decide to collect onsite data using aerial photography, the next step is to develop protocols for data collection. We divide our guidance on writing protocols into two parts: (1) general project instructions, which define the broad themes of data collection and general procedures; and (2) data collection procedures, which describe the specifics of

[11] Trustees may have aerial assets that could be considered for conducting the overflights. However competing demands for these resources, particularly during the active phase of a spill, may make it difficult or impossible for the aerial assets to conduct overflights according to the overflight sampling plan.

conducting overflights for the purpose of taking aerial photographs. While we address these topics separately, they can be part of the same protocol document.

General Project Instructions

The general project instructions address the following topics:

- Purpose of the project (e.g., to take photographs of sufficient quality to record recreational use levels in coastal areas potentially affected by the oil spill);
- Composition of the study team;
- Materials and equipment; and
- Other administrative details (e.g., data collection schedule).

Chapter 3 provides guidance on what to include in the general project instructions, and much of that guidance also applies for data collection using aerial photography (see Section 3.1). We provide additional guidance specific to aerial data collection in the following sections.

Composition of the Study Team

Since aerial overflights will likely be conducted by a small number of people—perhaps as few as one pilot—the discussion on team composition can be simplified. The aerial survey team will likely not need a team of supervisors overseeing them on a daily basis (as described in Chapter 3 for data collection using ground personnel), so study managers can serve as the direct points of contact.

Materials and Equipment

Sections on materials/equipment and safety in the general project instructions may be brief or unnecessary because presumably the pilot(s) will have been hired to supply all materials and equipment, and to conduct overflight safely as they have been trained to do.

Data Collection Schedule

The schedule should be clearly communicated to the aerial survey team, and should include flight dates, start times, and start locations.

Data Collection Procedures

The data collection procedures often address the following topics:

- Coverage area and times;
- Protocols for shoreline photography; and
- Handling and submitting data.

These topics are described in the following sections. An example data collection procedure for collecting aerial photographs is provided in Appendix B.

Coverage Area and Times

This section of the data collection procedures addresses the geographic and temporal coverage of the overflights. For example, the geographic coverage may include all sandy beaches along 200 miles of coastline, and the temporal coverage may include all daylight

hours for a three-month period. A map of the geographic coverage is helpful to include here, illustrating the boundaries of the route and the specific flight path.

The set of start locations and range of start times may also be defined in this section. For example, if the flight path is predominantly east-west, the potential start locations can include the western and eastern boundaries of the route. If the temporal coverage is 8:00 am to 8:00 pm and the flight takes an average of four hours to complete, the start times may range from 8:00 am to 4:00 pm to ensure complete coverage of the day.

Protocol for Aerial Photography

The protocol section of the data collection procedures includes specific directions for collecting aerial photography. Potential protocol items include the following:

- **Unavoidable deviations from the data collection schedule:** Weather, air traffic control, and other logistical factors may prevent the aerial survey team from meeting the exact start time for a flight. In these cases, the pilot may be given some discretion, such as the option to begin the flight up to one hour earlier or later than scheduled. Otherwise, the flight may be canceled. Similarly, if the pilot encounters weather conditions during the course of a flight that do not permit the pilot to adhere to the prescribed route, the pilot may be given discretion to bypass the portion of the route affected by adverse weather conditions. It is important that the aerial survey team maintains a flight log documenting the percentage of each flight route completed and any difficulties encountered. The log should be submitted along with the photographs from a flight.
- **Minimum photograph resolution:** The photograph resolution must be sufficient for counting recreators in the photographs (Exhibit 4.1). If the resolution is too low, zooming in on the photograph on a computer will degrade the clarity to the point where recreators cannot be counted reliably. Based on previous experience, we suggest using a camera with at least 20 megapixels so that the minimum resolution is 5,616 pixels wide by 3,744 pixels high.
- **Target areas for photographs:** The target areas may include the full extent of sandy beaches up to an adjacent road or building; areas along the sandy beach where recreation may occur, such as boardwalks, piers, picnic areas, and other outdoor recreational facilities; and portions of the water along the sandy beach where people are likely to be engaged recreation (e.g., up to 100 yards from the shore). Pilots should be instructed to fly the minimum distance away from and above the shoreline to capture these areas. This enhances photograph quality while maintaining complete coverage of target areas. Previous experience indicates that taking photographs from approximately 600 feet above ground and 750 feet offshore provides sufficient visible range and resolution of beachfront areas (English and Tourangeau, 2015).
- **Avoiding coverage gaps:** To avoid coverage gaps, the aerial survey team should be instructed to ensure overlap across all photographs. Depending on the speed of the airplane, this may require multiple photographs to be taken every second. Previous experience indicates that an airspeed of approximately 120 miles per hour with three pictures taken per second minimizes coverage gaps (English and Tourangeau, 2015).

- **Recording the time and location of photographs:** Most modern cameras track the time and location of photographs, though the clock and GPS may need to be calibrated initially to ensure accurate readings.[12] The aerial survey team should be asked to provide a summary of photograph times and locations from each flight in a "trackpoints" or "waypoints" file. These files can be provided in ArcViewer or Google Earth format and show the photograph names and times in a map.

Exhibit 4.1. Example Aerial Photograph

Handling and Submitting Data

The final section of the data collection protocol defines how the aerial survey team should handle and submit aerial photographs. Usually aerial photographs and metadata are stored on a memory card with sufficient capacity to hold all photographs taken during an overflight. These may be transferred after the flight to two hard drives, one for shipment to study managers and one as a backup to be retained by the aerial survey team. If required by the project, the retained hard drive(s) should be stored in a locked and secure location. If maintaining chain of custody is required for the study, study managers should provide specific direction on how to follow those procedures. To reduce cost, study managers should return hard drives to the aerial survey team after downloading the data.

[12] At the beginning of the assessment study managers should consider a protocol for setting the camera clock that will eliminate any confusion as to the time the picture was taken. In setting this protocol study managers may consider issues related to standard time versus daylight saving time and whether the overflights cross a time zone boundary.

4.3 Aerial Photogrpahy Data Collection Logistics

This section focuses on topics related to study implementation, including hiring and training of staff, and safety.

Hiring and Training

As stated above, study managers often do not have capabilities in-house to conduct overflights and will need to identify a company to conduct the aerial data collection. There are a small number of firms who advertise their aerial survey services. Study managers should identify a list of potential vendors in the area of the spill (e.g., using an internet search) and contact them to inquire about their capabilities for aerial photography data collection. Any potential vendor should be screened to ensure there is no conflict of interest.

Since study managers will likely hire an outside firm with a specialty in conducting overflights, training of the aerial survey team will likely be minimal. The basic project details described in the general project instructions can be provided by phone and/or webinar. Further, the aerial survey team can be directed to conduct one or two test flights for the purpose of training on data collection protocols. Additional oversight and retraining can be provided based on the review of data from each flight, as described in Section 4.4.

Safety

We encourage study managers to review the basics of safety with the aerial survey team (see Chapters 3 and 5) and stress that safety supersedes other data collection goals. The study safety plan should be reviewed with the aerial survey team, noting that sections addressing ground data collection may not be applicable. Since an outside company is likely to be hired, study managers must ensure that the company has its own safety protocols in place and meets all FAA requirements for flying an aircraft.

4.4 Aerial Photography Intake and Review

As the aerial survey team submits aerial photographs to study managers, a system will be needed to manage the inflow of the data. This step comes before data processing (i.e., extraction of user counts from the photographs), a topic covered in Chapter 6. This system includes organizing photographs and reviewing them for adherence to data collection protocols. The aerial survey team should be provided with regular feedback based on the outcome of these reviews.

Aerial photographs should be organized by flight date and photograph time. The aerial survey team should name photographs sequentially (i.e., based on photograph time) for each flight using the flight date in the filename (e.g., 20160825_001 would correspond to the first photograph taken on August 25, 2016). Further, the aerial metadata should be submitted in a separate tabular format, including photograph name, time, and coordinates. These metadata tables can be stored alongside the photographs in a folder containing the data from each flight.

A review of aerial photographs may include checks on the following elements:

- Each overflight was flown on the correct day and began at the correct start location and time, as dictated by the sampling plan/schedule;
- Metadata were received, including time and location of each photograph;

- All photographs were received. This can be done by comparing the waypoint file (i.e., summary of photograph names and times) against the set of photographs received;
- Photographs cover the entire route or documentation is present to describe the reason for any gap in coverage (e.g., flight log summary);
- Photographs are clear (i.e., they are not blurry and have good light contrast);
- The camera was tilted appropriately to capture all target areas; and
- Photographs are overlapping.

A random sample of photographs should be selected for this review if reviewing all of them is not cost-effective. Any deviations from the data collection protocols should be quickly identified and communicated to the aerial survey team so that improvements are made. For the purpose of maintaining chain-of-custody, the aerial survey team should record the time and date that they relinquish the data and data receivers should record the time and date that they accept custody.

4.5 Aerial Photography Data Collection Checklist

Below is a checklist to consider with items related to data collection using aerial photography. The checklist is meant to be used as a guide, rather than a list of required items.

- Evaluate the advantages and disadvantages (i.e., benefits and costs) of aerial photography data collection and decide if overflights will be used for the assessment.
- Develop aerial photography data collection protocols
    - General project instructions
    - Data collection procedures
- Staffing logistics
    - Hiring and training
    - Emphasize safety
- Field data intake and review
    - Develop data intake system
    - Organize and number photographs
    - Review photographs and provide feedback to aerial survey team

5. Safety Considerations for Data Collection

Safety is paramount to a data collection effort and is prioritized above any other data collection goals. This chapter provides guidance on developing a safety plan with which field staff may be required to familiarize themselves prior to collecting data. The second section describes formal safety training that may be required of all field staff. To summarize the topics covered in this chapter, we conclude with a checklist of safety-related items.

5.1 Writing a Safety Plan

Due to the importance of safety for onsite data collection, it is best practice for study managers to prepare a safety plan and require all field staff to review it as part of their initial training. Staff should also be required to sign and date a form confirming that they have read and understand the safety plan prior to going in the field. The purpose of this signed confirmation may be to meet requirements set forth by Trustees or RPs and/or to impress upon field staff how seriously the study managers take the issue of safety. If applicable, the safety plan should be sent to a Trustee safety officer for review and approval. If NOAA is a Trustee, study managers should consider using NOAA's Office of Restoration and Response (OR&R) Health and Safety Manual (NOAA, 2014). The rest of this section provides guidance on the elements that may be included in a safety plan. Appendix E provides an example safety plan.

General Themes

Safety plans emphasize the importance of safety by explicitly prioritizing it above any other data collection goals. Key themes often emphasized include the following:

- Personal safety requires all individuals to use their own judgment and to be vigilant about potential hazards;
- Staff can help ensure their own safety by continuously monitoring their surroundings and being proactive about any potential safety concern;
- Field staff are safer when working in teams and remaining within sight of each other. Safety plans often require teammates to use the buddy system to ensure the health and well-being of team members at all times; and
- People perceive potential safety concerns differently. The purpose of the plan is to provide guidance that is meant to be followed consistently by all field staff.

It is the responsibility of field supervisors to ensure that staff adhere to the safety plan, and that they safely arrive to and leave from the field each day.

Emergency Contacts

In case of a medical emergency, field staff can be instructed to dial 911. A field supervisor can be notified later. The safety plan must include the location of the nearest hospital or clinic to each site where staff will work. In non-emergencies, field staff can call their field

supervisors. Staff members can also provide an emergency contact name and telephone number prior to working in the field.

Drug and Alcohol-Free Workplace

Safety plans often stress a zero-tolerance drug and alcohol policy. Specifically, staff can be told not to use, possess, distribute, sell, or be under the influence of alcohol or illegal drugs while performing work. The legal use of a prescribed drug may be permitted on the job if it does not impair an employee's ability to perform the essential functions of the job effectively and does not endanger other individuals in the workplace or members of the public.

Clothing Requirements

Safety plans stipulate the clothing requirements for field staff. For example, the following articles of clothing may be required:

- Stable footwear with closed toes and closed backs.
- Mid-thigh length (or longer) shorts or pants.
- Lightweight short- or long-sleeve tops that cover the back and shoulders.
- Brimmed hat and sunglasses when working in non-shaded areas during daylight hours.
    - Winter/cold weather hat can be worn instead of a brimmed hat in cold weather conditions.

Personal Protective Equipment (PPE) Requirements

Required PPE is provided in the safety plan. For example, the following PPE may be required:

- Insect repellent
    - Used to prevent potential hazards associated with biting and/or stinging insects. The Centers for Disease Control and Prevention (CDC) recommends using insect repellent with the active ingredient DEET or Picaridin.
- Sunscreen
    - Used to protect against burns caused by sun exposure.
    - The use of sunscreen with an SPF rating of 50 or greater is recommended.
- First-aid kit
    - Used to treat basic scrapes, scratches, etc.
    - First aid kits can include cleansing wipes, antibiotic ointment, gauze pads, varying sizes of adhesive bandages, butterfly enclosures, first aid tape, and pain reliever/fever reducer caplets.
- Cooler with cold water or other drinks
    - Used to supply field staff with adequate fluids.

- Traffic safety vest
    - Used in places where automobile traffic is or could be present, including in parking lots and on/near roadways.
    - Study managers may require traffic safety vests to be reflective and American National Standards Institute 2 (ANSI 2) certified.
- Headlamp
    - Used in places and/or during times with inadequate lighting.

Field staff should be instructed to check supply levels and condition (i.e., wear and tear) of all PPE to ensure that they have all required supplies and functioning PPE prior to each day in the field. Field staff can replace any PPE as needed or contact their field supervisor for replacement. If applicable, study managers should consult with a Trustee safety officer for further guidance on PPE requirements and selection.

Potential Hazards and Mitigating Actions

A safety plan should include a list of potential hazards and mitigating actions relevant to the locations where field staff will be working and driving (see Appendix E). These might include exposure to oil or severe weather.

Responding to a Safety Incident

A safety plan typically defines the responsibilities of field staff and supervisors in the case of a safety incident or "close call". In the event a field staff is injured or has some other form of medical emergency, the following guidance may be provided in the safety plan:

- Contact emergency medical services as needed by dialing 911 or by some other means.
- The affected staff member's teammate takes the necessary steps to protect the affected staff member from imminent further harm, to the extent that this can be done without placing the teammate at risk.
- Notify a field supervisor of the situation as soon as possible without interfering with efforts to administer first aid or otherwise attend to the affected staff member's immediate well-being.

Instructions for specific incidents (e.g., a car accident) may be provided in the safety plan, in addition to the general guidance above.

We encourage study managers to require field supervisors to write up a field incident report to document a safety incident or "close call". Aside from any Trustee or RP requirements about reporting such incidents, these reports can inform additional safety training and oversight, and may bring about necessary revisions to data collection procedures. We suggest study managers talk to all staff and supervisors with knowledge of the incident and include at least the following information in an incident report:

- Names of affected field staff, teammate(s), and field supervisor;
- Date and location of incident;

- Description of event and any precipitating factors (e.g., working in extreme heat for multiple hours);
- Outcome of incident and disposition of affected field staff (e.g., administered basic first aid, including cool compress, and staff returned home to recover); and
- Any photographic documentation of the incident.

The example safety plan in Appendix E includes an incident form used for the Deepwater Horizon Recreational Use NRDA. If NOAA is a Trustee, study managers should consult NOAA's OR&R Health and Safety Manual, which has specific guidance on reporting an incident.

5.2 Safety Training Requirements

Study managers may require field staff and supervisors to complete a range of safety training programs prior to working in the field. For example, many oil companies have internal safety officers who require field staff to undergo basic training for oil response and assessment activities. Training programs that may be relevant to field work include:

- Oil spill response and assessment basic training (e.g., administered by the responsible party);
- HAZWOPER training (e.g., administered by an OSHA Training Institute Education Center);
- CPR, First Aid, and automated external defibrillator (AED) Training (e.g., through Red Cross);
- Defensive driving safety training (e.g., online course through the National Safety Council); and
- Heat and cold stress training (e.g., administered by a safety consultant).

We encourage study managers to consider the potential risks posed by the data collection effort and whether formal safety training is warranted. If formal safety training is required as part of the effort, these requirements can be summarized in the safety plan.

5.3 Safety Checklist

Below is a checklist to consider with safety-related items prior to collecting onsite recreational use data as part of an oil spill assessment. The checklist is meant to be used as a guide, rather than a list of required items.

- Write a safety plan
  - General themes
  - Emergency contacts
  - Drug and alcohol free workplace
  - Hazards of concern and mitigating actions
  - Clothing requirements
  - PPE requirements

    - Responding to an incident
    - Develop a template for field incident reports
- Safety training requirements
- Safety plan and training signature confirmations

6. Data Entry and Processing Procedures

In this chapter, we discuss procedures for data entry and processing that transform field data into an analysis-ready database. Much of the onsite information collected may be recorded on hard-copy forms. It is therefore necessary to transform these data into electronic format for analysis. Other data, such as aerial photographs, will be collected in electronic format, but require processing to extract counts of people at recreation sites for analysis. We highlight methods and considerations for data entry and processing of ground data and aerial photographs, including best practices for quality assurance and control. In the final section, we provide a checklist of items related to data entry and processing. As in other sections, the best practices described here might not be achievable or cost-effective for smaller spills or studies with smaller budgets.

6.1 Ground Data

In Chapter 3, we discussed the production of datasheets for data collection using ground personnel, and provided example datasheets in Appendix D. Further, we described a system for field data intake, whereby datasheets are scanned and assigned a unique number for subsequent processing. This section describes best practice data entry and processing methods for those data.

Data Entry

The example datasheets presented in Appendix D require field staff to record a mixture of circled responses (e.g., male or female is circled for gender) and written responses (e.g., a description of the activity the respondent took part in during the site visit). Given the nature of these responses, they must be converted to electronic format via data entry. The need for data entry may be reduced or avoided if datasheets are designed as an optical answer sheet (i.e., a "bubble sheet") where scanned datasheets can be read by optical character recognition (OCR) or optical mark recognition (OMR) software. Alternatively, data can be recorded electronically (e.g., on a tablet) so that data entry occurs as the data are collected. However, these methods present a different set of challenges, which are beyond the scope of this manual.[13] Therefore, the remainder of this section focuses on data entry of the forms included in Appendix D.

[13] For example, bubble response fields that are too close together may not be distinguished correctly by OCR/OMR software, requiring manual review. Further, scanning software is also limited in its ability to read text, which may lead to additional scanning errors and manual review. Tablets are expensive to buy and repair; may not be appropriate for use in certain types of environments (e.g., rainy/humid, sandy); and may lead to government property tracking requirements that study managers wish to avoid. These challenges will likely decline with improvements in technology. Any use of electronic field data collection devices should be fully tested in the potential operating environment before being adopted.

The most rigorous procedure for data entry is independent double data entry. Under this system, two people enter the data independently and the resulting electronic data are compared to identify discrepancies, which are resolved through a reconciliation process. It is best practice for a third person (i.e., someone who did not enter the data) to determine the resolution for any discrepancies. Further, a fourth person may be involved to verify the reconciliation process, so that all data entries have been agreed upon by two people.

Before data are entered, a template and protocol for entry need to be established.

- **Data entry template**: The template provides a standardized form for data entry. It includes a number of fields corresponding to the information recorded on the datasheets. There can be one field per question (e.g., gender is coded as 1 = male or 2 = female) or multiple (e.g., the set of activities the respondent took part are separate variables coded as 0 = respondent did not engage in activity or 1 = respondent engaged in activity). The template can come in many forms, though Microsoft Access and Excel are commonly used. An example data entry template is located here: https://darrp.noaa.gov/economics/economics-assessment.
- **Data entry protocol**: The protocol describes the data entry conventions for all data to be entered into the template. For example, the convention for text fields may be to use all capital letters and separate all words by a single space. For a numeric field, the codebook may list a small number of options that can be used for entry (e.g., 1 = male, 2 = female, and -9 = missing). The data entry template may be designed in a way that allows for identification and/or correction of data entry errors, thereby limiting errors in data entry.

It is common for the protocol to specify that all data be entered exactly as they were recorded on the datasheets. This means spelling errors, apparent am/pm errors for time variable (e.g., 2:00 am was recorded as the count time even though no data collection occurred at that time), and other consistency errors (e.g., a skip pattern designated on the datasheet was not followed) are not corrected during data entry. Additional processing to correct the aforementioned issues should be undertaken prior to analyzing the data (this issue is described in the next section). Finally, a codebook for the data should provide variable names and definitions, variable types (i.e., numeric or text), and the range of values. This information is helpful in analysis and for documenting the development of the database. We provide example codebooks with data entry guidelines for shoreline use counts and interviews in Appendix F.

Considerations

- **Choosing a data entry procedure:** The independent double data entry with reconciliation approach may not be warranted for every assessment, particularly when the magnitude of damages is expected to be low. In such cases, a less resource-intensive data entry approach may be chosen. For example, study managers may use single data entry by one person with or without targeted quality control checks by a second person. Alternatively, independent double data entry may be used on numeric fields, for which errors rates are likely to be low, and single data-entry with targeted checks may be used for text fields, for which minor errors in

spelling, spacing or punctuation are unlikely to greatly affect the interpretation of the entered text.

- **Developing a data entry template and protocol:** It is important to develop a standardized template and codebook for the data entry as early as possible in the assessment. However, this process should not be rushed in order to produce preliminary results, as project resources are usually best spent on data entry once the data entry template and protocol have been carefully developed. This often means waiting until a sufficient number of datasheets have been received and reviewed. This initial batch of forms can inform study managers about the range of issues to address in the data entry template and codebook.
- **Additional quality control:** It is best practice to implement additional quality control checks once all data have been entered. For example, a targeted draw of records from the electronic database (e.g., 10 percent) may be randomly selected for inspection. A reviewer could double-check the records against the original data forms, correct any discrepancies, and calculate an error rate associated with the sample. If the error rate is deemed to be too high by study managers (e.g., greater than one percent), another 10 percent of records could be chosen without replacement, and the process could continue until all records are checked or the error rate for a given sample is deemed sufficiently low. Additionally, if maintaining chain-of-custody is required as part of the effort, a data entry manager could verify that all data received on the chain-of-custody forms have been entered (chain-of-custody is addressed further in Chapter 7).

Data Processing

In most cases, some data processing will be necessary to prepare the electronic database for analysis. The types of data processing that may be necessary include the following:

- Coding of text responses;
- Resolution of apparent errors and inconsistencies in the data; and
- Creation of additional variables for analysis.

We describe each type of processing in the following sections. It is best practice to document how any data processing is done and to ensure quality control is maintained. The best practice for quality control is independent replication of all data processing decisions.

Coding of Text Responses

The example datasheets provided in Appendix D contain numerous text fields, some of which need to be hand-coded to convert the text response into numeric form. For example, on the shoreline use interview form, responses to Question 1 (“Could you tell me what activities you will take part in during your visit here today?”) may be in text format. In order to determine if the visit is for recreation or some other purpose, the text response should be coded into a set of categories, including all those that appear on the interview form and additional ones that did not. The process for coding these responses should be determined by study managers. It is customary to develop a coding manual that provides instruction to technicians who code the responses and to memorialize the coding decisions.

Other examples of text response that may require additional processing include Questions 2 and 3 from the shoreline interview form ("At what time did you first arrive here today?" and "How much longer do you expect to be here today?"). In some cases, respondents may offer a response that does not conform to the field on the datasheet. For example, the respondent might say, "I arrived ten minutes ago", rather than providing the exact arrival time, as the datasheet is designed to accept. Similarly, the respondent might say, "I'm leaving at sundown", instead of offering the number of hours and minutes of additional time he or she plans to spend on site. These cases, and other text responses, should be coded using a coding manual developed by study managers. The hand-coding of text responses can be expensive, so study managers should determine the appropriate use of project resources to undertake such an effort and design the datasheets such that text responses are minimized.

Resolution of Apparent Errors and Inconsistencies in the Data

While field staff should be offered feedback about data quality as the study occurs (refer to section 3.3), some mistakes will still be made. Further, data values on a given data form may contradict other values on the same form, or fall outside the expected range. It is best practice to correct these errors and inconsistencies to the extent possible if the correct value is unambiguous or highly probable. For example, consider the following examples and resolutions:

- The count time on a shoreline use count sheet is recorded as "2:00 am". Given that data collection at the site was scheduled for 2:00 pm and no data collection was scheduled at night, the time is changed in the database to "2:00 pm".
- The interview time on a shoreline use interview form was recorded as "1:04", but without am or pm. The time is changed to "1:04 pm" because data collection at the site was scheduled to start at 12:40 pm and the previous and subsequent interview forms show interview times of "1:02 pm" and "1:05 pm", respectively.
- The Town/City, State/Province, and Zip/Post Code on a shoreline use interview form are recorded as "Okemos", "MI", and "48064". A consistency check of this information shows that the responses are not consistent (i.e., the ZIP code is not a valid code for Okemos, Michigan). The ZIP code is changed to "48864" because this is a valid ZIP code for Okemos, MI and the "0" in the recorded ZIP code is slightly illegible on the datasheet and could reasonably be interpreted as an "8".

The examples above represent a subset of errors and inconsistencies study managers might encounter. The proposed resolutions demonstrate how these cases can be defensibly handled in order to preserve the greatest amount of data possible. It is up to the study managers to determine what level of review is appropriate to identify these cases, and ultimately what logic will be used to address them. If any such processing is done, it is best practice to document the rules for how the cases are handled and to ensure quality control is maintained. For documentation purposes, it is also best practice to maintain the original values of any variable and place the revised values in a new variable.

Creation of Additional Variables for Analysis

The last processing step is the creation of additional variables necessary for analysis. As described in Chapter 3, the necessary data points for estimating user days include the following (by data collection method):

- Instantaneous counts:
  - Instantaneous count of visitors;
  - Purpose of the visit (to separate recreation use from other uses); and
  - Visit duration (to convert the instantaneous count to an estimate of total visits).
- Interval counts:
  - Unique count of departures or arrivals over a given time interval;
  - Purpose of the visit (to separate recreation use from other uses); and
  - Party size (applicable if boats or vehicles are counted rather than individuals).

The datasheets included in Appendix D do not have a variable indicating if a visit is for recreation or another purpose, and they do not have a variable for visit duration. Therefore, these variables must be constructed prior to analysis. The other data points listed above are present on the datasheets, and may not require any additional processing.

- **Purpose of the visit:** To construct a variable indicating if a visit is for recreation or some other purpose, study managers will need to consider responses to the activity question (e.g., Question 1 on the shoreline use interview form). Generally, the first step is to determine which response categories will be considered recreation and which will be considered non-recreation. The second step is to decide how to handle multiple responses, particularly when at least one recreation category and one non-recreation category were selected. Finally, the indicator variable is constructed based on the resolution of the two previous steps. In other assessments, two questions have been used to separately record information about activity and location.
- **Visit duration:** Given the information collected on the datasheets in Appendix D, the visit duration would be constructed as the difference between the interview time (recorded prior to Question 1) and the time the respondent arrived at the site (Question 2), plus the additional time the respondent expected to stay at the site (Question 3). Study managers may have to create a rule for handling cases where the interview time is earlier than the respondent's reported time of arrival. Such cases may be coded as missing.

The following additional variables may also be needed for analysis:

- **Sampling event ID:** Characteristics of the sampling design will be relevant for estimating user days. Therefore, it is customary to assign a unique ID to each sampling event in the sampling plan and to add a corresponding variable to each record in the electronic database. This common ID serves to link the sampling plan with the electronic database so that characteristics of the sampling design can be easily incorporated into the analysis.

- **Disposition codes:** Lastly, it is best practice to develop a disposition code (or multiple codes) for each record in the database. A disposition code describes the outcome of each scheduled sampling event. Generally speaking, the code describes if the data were collected as expected; if some, but not all data were collected; or if no data were collected. If some or no data were collected, the particular code used indicates the reason why this was case. In cases where data are missing, a record should be added to the electronic database with a disposition code indicating why the data are missing. Thus, the database will include a record for every sampling event, whether or not data were collected.[14] These disposition codes should be considered along with the data at the analysis stage so that any potential limitations of the data can be evaluated and addressed.

  The following data collection outcomes for ground data may be represented by a set of disposition codes that are assigned to each record in the electronic database:

  - Data collection completed according to protocol;
  - Data collection partially completed because site was only partially open/accessible;
  - Data collection partially completed/data not collected due to darkness or weather; and
  - Data not collected due to staff illness, car accident or vehicle breakdown, holiday cancelation, field staff unable to find parking, or site was closed.

The sources for developing these disposition codes include notes recorded in the comments box on the datasheets and other notes recorded by project staff. The form could also be designed to record these dispositions as data are collected. In cases where data were collected as expected or partially collected, a datasheet (and corresponding record in the database) will exist that contains any relevant information needed to develop the disposition code(s). In cases where data were not collected, a datasheet may or may not exist, depending on the protocol for handling such situations. If a datasheet does not exist, study managers will have to rely on other field notes recorded by project staff to develop the disposition code(s). An example of a disposition codebook for ground data is provided in Appendix F. The example codebook demonstrates a wide range of data collection dispositions, some of which may not be relevant for every assessment.

6.2 Aerial Photographs

In Chapter 4, we discussed the collection of aerial photographs using overflights. This section describes best practices for processing aerial photographs for analysis. The result of this processing is an electronic database that includes counts, count times, and disposition codes for each aerial sampling event.

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[14] At first glance, it may seem unnecessary to attach a disposition code to sampling events for which no data were collected. However, the estimate of recreational use is based on an analysis of each sampling event, including those with missing data. In addition, the disposition code will allow study managers to easily answer questions as to why data are missing.

The components of aerial photograph processing include the following:

- Compilation of aerial photographs by sampling event (i.e. segment, date, and time);
- Counting of users in the compiled photographs; and
- Creation of additional variables for analysis.

Compilation of Aerial Photographs by Beach Segment

The data for an aerial sampling event will consist of a number of aerial photographs, which capture users on a segment of beach on a particular day and time. The photographs can be compiled and prepared for counting in two steps:

- **Compile the photographs:** The first processing step is to compile the photographs that are to be counted for a sampling event. These photographs may be saved side-by-side in a Microsoft Excel spreadsheet or in a Photoshop Document (PSD). Data processing technicians will likely find it easiest to identify the relevant photos based on photograph coordinates and a set of reference segment photographs from an earlier overflight that have already been processed.
- **Delineate count area:** Next, lines are drawn on the photographs to delineate the beginning, ending, and interior boundaries of the segment. The purpose of drawing these lines is to maintain a consistent count area across sets of photographs obtained from different overflights. Data technicians should rely on a set of reference photographs to draw these lines, which show the landmarks used to define segment boundaries and the areas counted in each segment. Finally, since adjacent photographs are likely to overlap (refer to the data collection procedures described in Chapter 4), additional lines or polygons should be drawn on the photographs to delineate these areas. The overlapping area will be included in the count for one picture and excluded from other pictures capturing the same area.

Counting Users in the Compiled Photographs

After the photographs have been compiled and the boundaries delineated, the next step is to count users in the photographs. The best practice for this processing is to obtain two independent counts. Counting can be done in three steps:

- **Place dots on photographs:** A colored dot is placed on each person within the count boundaries. If necessary, different colored dots can be used to distinguish different activities and recreation areas within a segment. For example, the activities might include fishing, surfing, kayaking/canoeing, jet skiing, parasailing, boating, or general use. The locations might include sandy beaches, piers or jetties, water areas, and other areas. In some cases, images in the photographs will be ambiguous (e.g., a dense crowd makes it hard to distinguish each person) or a person may be positioned along a segment boundary. Study managers should develop rules for handling these cases (e.g., only include people who can unambiguously be identified in the judgment of the counter; include anyone on the boundary who is mostly within the segment). With advances in machine learning, it might be possible to automate this step in future studies.
- **Count the dots:** The counting of dots placed on the photographs may be done manually, but automated counting is less prone to errors (after initial verification) and

yields significant time savings relative to a manual approach. For example, a .NET (a Microsoft software development Framework) photograph processing application can be designed to count the dots and save the information to a database or spreadsheet. The process can be designed to distinguish between different colors, yielding separate counts for different activities and locations.

- **Handling discrepant counts:** If data entry protocols produce two independent counts for each sampling event, study managers should develop a rule for handling counts that differ. For example, a third count might be conducted if the two counts differ by greater than some pre-defined threshold (e.g., more than two if the average count is 20 or less, or more than 10 percent if the average is greater than 20). Further, a rule will be needed to determine the final count at the photograph level and at the segment level (e.g., an average of the two closest counts).[15]

Creation of Additional Variables for Analysis

The last processing step for aerial data is the creation of additional variables necessary for analysis.

- **Count time:** The time that each photograph was taken will likely be of interest to an analyst. As described in Chapter 4, most modern cameras record the time and location of a photograph. This information should be extracted from the photograph metadata and associated with the count for each sampling event in the database.
- **Sampling event ID:** Section 6.1 described adding a unique ID to each ground sampling event in the sampling plan and to the corresponding record in the electronic database. It is best practice to do the same for the aerial dataset. Again, the purpose of this is to create a common ID that links characteristics of the sampling design to the counts database, which can then be used in analysis.
- **Disposition codes:** Finally, it is best practice to add disposition codes to the aerial dataset, as described in section 6.1 for ground data. These disposition codes should be considered along with the data at the analysis stage. The following data collection outcomes for aerial data may be represented by a set of disposition codes that are assigned to each record in the electronic database:
    - All segment photographs available and taken according to protocol;
    - Some or all segment photographs missing due to weather, darkness, fog, mechanical or personnel issues, or holiday cancelation; and
    - Some or all photographs do not overlap with a preceding photograph (not applicable for the first photograph in a segment).

  The sources for developing the disposition code(s) include visual inspection of the photographs and notes provided by the aerial survey team. In cases where all photographs are missing for a segment, a record should be added to the electronic

[15] A similar rule would be needed for ground data if the data collection protocol resulted in two unique counts.

database with a disposition code indicating why the data are missing, so that the database will include a record for every sampling event, whether or not photographs were taken.

The preceding discussion provided guidance on how to convert aerial photographs into an electronic database of segment counts and count times. It is best practice to document all processing steps both for the purpose of documentation and to serve as a protocol for data processing technicians. As described above for ground data, the best practice for quality control is to independently replicate all data processing. Further, a random sample of records can be drawn from the aerial database to recheck all elements of processing, fix any errors, and estimate an error rate. Study managers can then develop a protocol detailing what next steps should be undertaken based on the observed error rate.

6.3 Data Entry and Processing Checklist

Below are two checklists to consider with items related to data entry and processing, one for ground data and another for aerial data. The checklists are meant to be used as a guide, rather than a list of required items.

Ground Data

- Determine method for data entry of datasheets
  - Independent double data entry
  - Other
- Develop template for data entry
- Develop codebook and data entry protocols
  - Variable names, definitions, types, and range of values
  - Conventions for entry of data into template
- Determine what, if any, additional processing is necessary
  - Coding of text responses
  - Resolution of apparent errors and inconsistencies in the data
  - Creation of additional variables for analysis (e.g., disposition codes).
  - Document processing decisions

Aerial Data

- Process aerial photographs
  - Compilation of photographs by segment
  - Counting of users in compiled photographs
  - Creation of additional variables for analysis (e.g., disposition codes).
  - Document processing decisions

7. Litigation Considerations

At the outset of a recreational use assessment, it is often uncertain whether the case will end up in litigation. The potential for litigation raises several important issues that should be considered early in the assessment to preserve the option of successfully introducing the collected data into evidence at trial. In this chapter we discuss several of these issues, including document retention, chain of custody documentation for field data, secure storage of assessment data and associated documents, electronic communications, confidentiality, and independent third-party verification of the data collection effort.

7.1 Document Retention

All assessment documents, whether handwritten or electronic, are subject to retention requirements. At a minimum, they must be retained for some period of time pursuant to the Federal Records Act (which is beyond the scope of this manual). In a litigation or potential litigation context, these documents may also be subject to a litigation hold or a preservation order. The former is normally imposed by a Trustee agency's General Counsel, and the latter by a federal court. In either case, what must be retained, in what format, and for how long are case specific. Trustee attorneys usually provide study managers with detailed instructions regarding their obligations under any existing litigation hold or preservation order. It is then the responsibility of the study managers to communicate the instructions to all team members.

A few types of handwritten documents that are commonly generated during the assessment include the following:

- Notes taken during meetings or phone calls;
- Hard copies of data collection forms; and
- Any notes taken by field staff.

Unless study personnel are instructed otherwise, these documents will be retained by the person who produced or received them (the "custodian") until he or she is required to turn them over to case attorneys or is permitted by attorneys to dispose of the documents. Documents should be kept in a manner that minimizes the potential for unauthorized access. This might include keeping the documents locked in an office whenever the custodian is not present.

The types of electronic documents that may be generated during the assessment could include the following:

- Reports;
- Presentations;
- Data collection materials;

- Spreadsheets and other analysis files; and
- Emails

Electronic documents are subject to frequent revisions as the assessment progresses. In cases where a retention requirement would apply to a given document, this raises the question of what constitutes a new "version" of a document that must be separately retained. Case-specific guidance may specify the point(s) in the lifespan of an electronic document at which a specific version must be separately retained. For example, a version may become subject to retention requirements when it is shared with other members of the assessment team or when it forms the basis of discussion at a meeting. Alternatively, a version may become subject to retention requirements at each point when it undergoes significant changes. Study managers should discuss these retention issues with Trustee attorneys as early in the assessment as possible.

Study managers can establish procedures that assist in the proper retention of electronic documents. For example, they may require all team members to work within a project directory located on a secure server accessible to assessment team members.

7.2 Chain of Custody Documentation for Field Data

Study managers may choose to establish a formal chain of custody for data collected as part of the assessment. The purpose of maintaining chain of custody is at least two-fold:

- **Documentation:** A chain of custody documents the custodian of a given piece of data (e.g., a field data form) throughout the course of the assessment. Within the litigation context, a rigorous chain of custody helps ensure the integrity of the data. All data obtained in the field will originate with a specific individual. For data collected on the ground (i.e., counts, interviews, and any field notes) these individuals include field staff assigned to collect data at various sites. For data obtained through aerial photography (i.e., photographs, logs, and any associated notes) these individuals include the crew assigned to conduct overflights. The data collector is the original custodian of the data. The chain of custody process is initiated when the original custodian relinquishes custody of the data to another person. The person accepting custody of the data is then the custodian. Keeping a record of each transfer of the data preserves and documents the chain of custody.
- **Quality assurance:** A chain of custody can be useful under quality assurance procedures. For example, if the quality assurance procedures identify a sampling event for which no data is present, the chain of custody forms can be useful in understanding the lack of data. If there is no chain of custody form that covers the missing data, it is an indication that the data may never have been received by a data entry manager. This might initiate a research process to identify the reason the data was never received. If an existing chain of custody form documents the missing data, it suggests that data was received by a data entry manager and that the forms may have been missed in the data entry or data processing stages.

Appendix G shows an example chain of custody form, which can be modified as needed for a future assessment. The chain of custody form will generally include the following information:

- Original data custodian and affiliation;
- Description of the data under his or her custodianship, including the medium;
- The date and time when the data were relinquished to a subsequent custodian;
- The name and affiliation of the new custodian; and
- The date and time the new custodian accepted the data.

The chain of custody form documents the data custodian at each point in time, and may include procedures for transfer of custodianship. As discussed in Chapters 3 and 4, data collection protocols may also include instructions about how to follow chain of custody procedures.

For some assessments, the data may be transferred in a manner that puts it beyond the physical control of a data custodian. For example, field data forms may be sent from a field staff member to a data entry manager via a delivery service. In these cases, the documents for transfer may be placed in a packet that is sealed with evidence tape. Prior to accepting custody, the receiving custodian can examine the evidence tape to determine whether the packet containing the data has been tampered with in transit, and document any anomalies.

7.3 Secure Storage of Assessment Data and Associated Documents

Study managers may choose to establish a secure server (i.e., server-based network) on which assessment data and other documents are stored and accessed by assessment team members. Access to the server may be granted to team members under a unique login name with password protection. The creation of a secure server can provide a number of benefits for the assessment. First, it facilitates document retention by providing a central location where documents are stored. Second, it provides a higher level of protection against document loss than would otherwise be available to team members who would store electronic documents on personal devices. Third, in the event that data is lost, an audit of the system can show who had access and, potentially, who accessed the materials last. Finally, the use of a secure server can prevent access to documents by individuals without authorization.

The use of a secure server may have some drawbacks. First, the establishment and maintenance of the secure server will result in additional costs for the assessment. Second, a requirement to use the secure server imposes another layer of complexity for team members (e.g., the need to be connected to the internet to access documents).

7.4 Electronic Communications

Electronic communications between team members that are generated as part of an assessment are subject to retention requirements, just like any other document. As a result, team members should archive all emails related to the assessment. There are several ways this can be done, and the best method is influenced by the user's email system and his or her normal practices. The user's email system should provide some means to (1) organize emails by case, topic, etc., and (2) bulk download or transfer a specific group of these emails when they must be produced to the court or another party in litigation. However, these features are not available in every email system. For example, some email systems, such as Google Mail, allow the user to "tag" emails or put them in folders, but do not allow the user to then download or transfer a particular folder. Other systems may allow this kind

of tagging and transfer. Users may also download their emails to Outlook or some other software client and organize them there. At the outset of the case, the participants should consult with the Trustee attorneys and their own IT staff to ensure that the features described above are available and how they should be used.

It may also help if each team member is assigned an assessment-specific email account (e.g., an email service provided through the secure server). Such a system allows for easy archival and retrieval of assessment-related email, should that be required as part of the litigation process. These issues can be very important when team members are working on a number of other unrelated projects or may otherwise use a personal email account. In addition, the assessment-specific email accounts could be configured to automatically insert any statements about confidentiality required by case attorneys (discussed in section 7.5).

7.5 Confidentiality

Confidentiality issues may arise at several points in an assessment. As a result, study managers should consult with attorneys overseeing the assessment on these issues and manage any requirements related to confidentiality. For example, attorneys may ask that a standard statement about the confidential nature of the communications be included in every assessment-related email. Further, attorneys will likely require each team member to sign a confidentiality agreement that contains language specific to the case.

Another issue of confidentiality can arise with respect to data collected by field staff. It is possible that field data may contain items classified as personally identifiable information (PII), such as respondent addresses and names. It is standard practice to require that no data containing PII be released beyond the assessment team. However, respondent confidentiality could be compromised through separate releases of respondent information, each of which does not individually constitute PII, but collectively could be used by a diligent analyst to identify the respondent. For example, information about household composition (number of household members, ages, genders and races) along with a ZIP code might be sufficient to identify a respondent, even if the information is released separately. Although study managers may not wish to release data in some cases, they may be subject to discovery in a litigation context. As a result, study managers should be deliberate about the types of data that are collected and be careful about how the data are released to ensure respondent confidentiality is maintained to the maximum extent of the law.

7.6 Independent Third-Party Verification of the Data Collection Effort

In cases where Trustees implement a recreational use assessment without RP involvement, the case attorneys may want an independent evaluation of the collection effort. If the findings of the review are generally positive, this could bolster the merits of the study in the event the claim is litigated. A third party without any involvement in the assessment, but with expertise in recreational use data collection, could review and comment on all aspects of the study, including sampling design, data collection, handling, entry, and processing.

8. Putting It All Together

This manual has covered a range of topics related to onsite data collection, including sampling design, development of data collection materials, study implementation, field data intake and review, data entry and processing, and litigation considerations. The purpose of this chapter is to concisely summarize each of these topics and to highlight the key steps necessary to prepare for and implement an onsite data collection effort.

8.1 Step 1: Create a Sampling Plan

A sampling plan is created prior to collecting data. The plan provides the schedule for data collection, inclusive of the sites, days, and times (see Chapter 2), and is designed to meet data collection goals while also meeting budget and logistical constraints (e.g., assessing whether the benefits of collecting aerial photography justify the cost). The sampling plan must include considerations of federal, state, and local laws to ensure that activities are in compliance with applicable statutes, and requirements are met. This is a highly context-specific step for onsite data collection. Appendix A provides example multi-stage sampling plans for study managers to consider.

8.2 Step 2: Develop Data Collection Materials

Once a sampling plan has been created, the next step is to develop materials for collecting onsite data. These may include general project instructions, data collection procedures, site-specific protocols, datasheets, and a safety plan (see Chapters 3, 4, and 5). Appendices B, C, D, and E provide example data collection materials for study managers to consider. If data are collected using ground personnel and aerial photography, separate materials will likely be necessary for each collection method. Further, some materials may only be applicable to one of the methods.

8.3 Step 3: Hire and Train Personnel

The final step before implementing data collection is to hire and train field personnel, including pilots if aerial overflights will be conducted (see Chapters 3 and 4). For small spills, Trustees may have the internal capacity to staff an onsite study. For larger spills, Trustees may require additional staffing support, which can be provided by a mix of Trustee consultants, RP staff and consultants (if a cooperative assessment), and labor from a staffing agency. All staff should be trained on data collection procedures and safety protocols prior to collecting data.

8.4 Step 4: Implement Data Collection

After all preparations have been made, the next step is to implement the data collection effort. Study supervisors should actively support and monitor field staff to ensure they have all the necessary data collection materials and equipment, are correctly implementing the data collection procedures, and are abiding by safety protocols (see Chapters 3, 4, and 5).

Datasheets and aerial photographs should be reviewed shortly after the data are collected to identify and address any potential data collection problems.

8.5 Step 5: Prepare Data for Analysis (Data Entry and Processing)

The final step is to enter and process field data to develop an analysis-ready database. Hard-copy datasheets should be converted to an electronic dataset using a data entry system (e.g., independent double data entry). Ground and aerial data may require processing to code text responses, resolve apparent errors and inconsistencies in the data, create additional variables for analysis, and to count users in aerial photographs (see Chapter 6 and Appendix F).

The manual has focused on methods and considerations for onsite data collection using ground personnel and aerial photography. Several other data collection methods, which readers may wish to consider, are beyond the scope of this manual, including offsite surveys, automated counters, and roving or fixed-point ground photography/videography. As technology advances, readers may also want to consider the use of remote sensing (satellites and drones), social media, and cellular data.

While this manual provides general best practices for collecting onsite data, it does not address the methods for estimating user days in great detail using the data collected. It also does not provide guidance on the development of a recreational damages claim for a NRDA. These topics are beyond the scope of this manual and are case-specific. Given their importance and potential complexity, we direct the reader to documentation for past NRDAs where onsite data were collected to assess injuries to recreation use (see DWH Trustees, 2016; English, 2010; Leggett, Curry, and Scherer, 2010; Chapman and Hanemann 2001; Hanemann, 1997; and EERG, 1997).

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Appendix A. Example Sampling Plans

Exhibit A.1. Example Instantaneous Counts Sampling Design for Shoreline Use Sites

OVERVIEW

Imagine an oil spill has occurred off the coast of Florida in the Atlantic Ocean. Study managers want to assess the impacts to shoreline use on approximately 200 miles of beach between Cocoa Beach and Miami. Based on the size of the spill and past experience, study managers want to understand any potential changes in shoreline use over the ten-week period following the spill. The focus of the effort will be on impacts from 8:00 am to 8:00 pm when most beach use is likely to occur. Given the open-access nature of these beaches, study managers have opted to collect data using instantaneous counts. Specifically, ground counts and interviews will be complemented by aerial photography to enhance the number of sites covered on a given sampling day. The aerial photographs will be the primary source of counts and the ground sampling will be the primary source of onsite durations, which will come from interviews with beachgoers.

Study managers have eight personnel available to collect data on the ground. They are not allowed to work more than eight hours per day. Further, these staff must work in teams of two for safety reasons, meaning four teams of two are available for ground data collection. After consulting with the project team's statistician, study managers have determined that data will be collected at a sample of sites on two weekdays and two weekend days each week. Monday through Friday are considered weekdays, while Saturday and Sunday are considered weekend days. To save costs, the ten-week period will be stratified by two-week periods, and just one fifth of all sites will be sampled in a given sub-period. This will reduce the number of photographs that need to be processed from overflights and limit the number of sites to be covered on the ground. The 200 miles of coastline will be divided into segments that will be grouped into loops for ground sampling. Count times within a loop will be spread across a 12-hour sampling day, and two field teams will be used to sample sites in a loop (i.e., one team will cover the first two or three sites in a day and the other team will cover the remaining sites). The start times of the overflights will range from 8:00 am to 4:00 pm, as flights take four hours to complete. The starting point will also vary, sometimes flying north to south from Cocoa Beach and sometimes flying south to north from Miami.

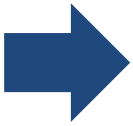
STAGE 1: SELECTING SITES

In the first stage, sites are selected. First, the coastline is divided into 200 beach segments approximately one mile in length. Segments are defined at either end by visible landmarks, such as the edge of a building or a pier, so that segment boundaries will be easily recognized in the overflight photographs and on the ground. Second, the segments are numbered north to south from "1" to "200". Segments ending in "1" or "6" are considered Group 1, those ending in "2", or "7" are considered Group 2, and so on up to Group 5. This creates five groups with 40 segments each, where Group 1 contains segments 1, 6, 11, 16, 21, … and 196. Third, eight loops of five segments each are created within each group. Group 1 - Loop 1 (G1L1) contains segments 1, 5, 11, 16, and 21; Group 1 - Loop 2 (G1L2) contains segments 26, 31, 36, 41, and 46; and so on through G5L8. Finally, the groups are selected without replacement for the five two-week periods.

Exhibit A.1.1 shows how Excel can be used to randomly select the groups for the five two-week periods. Random numbers are listed next to each group using the RAND function in Excel, and then sorted largest to smallest. The first group listed after sorting is sampled during the first two-week sub-period, and so on. The left panel in Exhibit A.1.1 shows the starting set of groups and the right panel shows the set of groups after sorting.

Exhibit A.1.1. Selection of Sites

GROUPS
Group 1
Group 2
Group 3
Group 4
Group 5



SAMPLED GROUPS BY TWO-WEEK PERIOD	
GROUP	RANDOM NUMBER
Group 4	0.617
Group 2	0.565
Group 5	0.337
Group 1	0.165
Group 3	0.155

STAGE 2: SELECTING DAYS

In the second stage, sampling days are selected. As described above, data will be collected at a sample of sites on two weekdays and two weekend days each week. Although there are four field teams available for ground sampling, data collection will span a 12-hour day. Thus, two teams will be needed to split data collection at sites in a loop. This means two loops can be sampled per day, meaning that all eight loops will be sampled once every two weeks within the weekday/weekend strata.

Loops are organized into pairs based on proximity for additional safety (i.e., the two field teams will be closer together in case of an emergency). Loops 1 and 2 comprise Pair 1, Loops 3 and 4 comprise Pair 2, and so on. To enhance variability in the sample, the day of week for weekdays is selected without replacement in each two-week period across the pairs. Thus, if Monday of week one is chosen for Pair 1, Monday of week two is not eligible for sampling.

Exhibit A.1.2 shows how Excel can be used to select days given the stratified random sampling approach described above. For simplicity, the exhibit only shows the selection of weekdays for Group 4 loops in the first sub-period (i.e., the first two weeks). Since two weekdays need to be selected from each week, the days are listed twice. The first weekday selected is for Pair 1 (i.e., G4L1 and G4L2), the second is for Pair 2, and so on. Random numbers are assigned to all days using the RAND function in Excel. The random numbers within the set of days for each week are sorted from largest to smallest. The selected days and loop pairs are then bolded. The first selected weekday from Week 1 is Friday for Pair 1. The second selected weekday for Week 1 is Monday for Pair 2. Notice how Monday of Week 1 is the day with the highest random number that hasn't already been chosen. The first selected weekday in Week 2 is Tuesday and the second selected weekday for Week 2 is Thursday.

Overflights are scheduled for the same days as ground data, so Exhibit A.1.2 also shows the selection of days when aerial photography will be collected.

Exhibit A.1.2. Selection of Weekdays, sub-period 1

SUB-PERIOD 1 WEEKDAY SAMPLE DAYS		
DAY	**LOOP PAIRS**	**RANDOM NUMBER**
Week 1		
Friday, Week 1	**Pair 1 (Loops 1 and 2)**	**0.964**
Wednesday, Week 1		0.336
Tuesday, Week 1		0.274
Thursday, Week 1		0.235
Monday, Week 1		0.014
Friday, Week 1*		0.739
Monday, Week 1	**Pair 2 (Loops 3 and 4)**	**0.602**
Thursday, Week 1		0.458
Tuesday, Week 1		0.442
Wednesday, Week 1		0.103
Week 2		
Friday, Week 2		0.919
Monday, Week 2		0.909
Tuesday, Week 2	**Pair 3 (Loops 5 and 6)**	**0.266**
Wednesday, Week 2		0.216
Thursday, Week 2		0.008
Monday, Week 2*		0.492
Thursday, Week 2	**Pair 4 (Loops 7 and 8)**	**0.474**
Tuesday, Week 2		0.100
Wednesday, Week 2		0.039
Friday, Week 2		0.018

*Friday of Week 1 is not considered for selection since it was already selected previously. Similarly, Monday and Friday are not eligible for sampling in Week 2 since these days were selected for Week 1.

STAGE 3: SELECTING TIMES

In the third stage, sampling times are selected. For ground sampling, five count times are used to represent the 12-hour sampling day: 8:00 am, 10:45 am, 1:30 pm, 4:15 pm, and 7:00 pm. A start site is randomly selected for sampling a loop on a given day. The count times are fixed along with the ordering of the sites within a loop. For example, if the third start site is selected for G4L1 (contains segments 4, 9, 14, 19, and 24), the sites will be sampled as follows: Segment 14 at 8:00 am, Segment 19 at 10:45 am, Segment 24 at 1:30 pm, Segment 4 at 4:15 pm, and Segment 9 at 7:00 pm. The start sites are selected without replacement until all five sites have been exhausted, and then the process is repeated. There will be one set of randomized start sites for weekday observations and one set of randomized start sites for weekend observations.

Exhibit A.1.3 shows how sampling times can be selected using Excel given the stratified random sampling approach described above. For simplicity, the exhibit only shows the start sites for weekday loops. Further, it only shows half (i.e., 20) of the start sites that are needed for the 40 loops that will be sampled on weekdays during the ten-week study. Random numbers are assigned to each start site, which are then sorted from largest to smallest within unique sets of five sites. The first start site on the list is used for the first loop sampled; the second start site on the list is used for the second loop sampled; and so on. Each start site is used eight times across the ten week-period within a weekday/weekend stratum.

For aerial sampling, the start times include 8:00 am, 12:00 pm, and 4:00 pm. Since each flight takes about four hours to complete, these start times provide coverage from across the 12-hour sampling day. Further, the starting locations include Cocoa Beach and Miami. This yields six starting time-location combinations. These combinations are selected without replacement within weekday/weekend strata until all combinations have been exhausted, and then the process is repeated.

Exhibit A.1.4 shows how the starting times and locations for overflights can be randomly selected using Excel. For simplicity, the exhibit only shows the times and locations for the 20 weekdays on which overflights will be conducted. Random numbers are assigned to each time-location combination, which are then sorted from largest to smallest within unique sets of six. The first time-location combination on the list is used for the first overflight; the second time-location combination on the list is used for the second overflight; and so on. Since 20 weekday overflights will be conducted, two of the time-location combinations are used four times, while the remaining four combinations are used three times. The unused combinations are in gray colored font in the exhibit. This approach ensures the resulting sample is as balanced as possible. This slight imbalance can be accounted for in the estimation of user days.

Exhibit A.1.3. Selection of Weekday Times, Partial List for Ground Sampling

WEEKDAY SAMPLING TIMES	
START SITE	RANDOM NUMBER
Site 2	0.958
Site 5	0.317
Site 1	0.283
Site 3	0.257
Site 4	0.087
Site 4	0.482
Site 3	0.470
Site 5	0.322
Site 2	0.044
Site 1	0.013
Site 4	0.904
Site 1	0.623
Site 5	0.420
Site 3	0.329
Site 2	0.225
Site 5	0.911
Site 4	0.791
Site 3	0.579
Site 1	0.457
Site 2	0.171

Exhibit A.1.4. Selection of Weekday Times, Partial List for Aerial Sampling

WEEKDAY SAMPLING TIMES	
START SITE	**RANDOM NUMBER**
4:00 pm - Miami	0.948
8:00 am - Miami	0.870
12:00 pm - Cocoa Beach	0.823
8:00 am - Cocoa Beach	0.748
4:00 pm - Cocoa Beach	0.707
12:00 pm - Miami	0.333
4:00 pm - Miami	0.952
4:00 pm - Cocoa Beach	0.761
12:00 pm - Miami	0.658
12:00 pm - Cocoa Beach	0.498
8:00 am - Cocoa Beach	0.226
8:00 am - Miami	0.047
12:00 pm - Miami	0.884
8:00 am - Cocoa Beach	0.703
12:00 pm - Cocoa Beach	0.683
4:00 pm - Miami	0.592
8:00 am - Miami	0.429
4:00 pm - Cocoa Beach	0.260
4:00 pm - Cocoa Beach	0.889
8:00 am - Cocoa Beach	0.613
8:00 am - Miami	0.612
12:00 pm - Miami	0.562
4:00 pm - Miami	0.295
12:00 pm - Cocoa Beach	0.260

FINALIZING THE SAMPLING PLAN

The sampling plan is finalized by transposing the various randomized sampling dimensions from Excel into tabular format. It is customary to sort the table by day and time. Exhibit A.1.5 shows a partial sampling plan: week 1 weekday samples for ground data collection. Exhibit A.1.6 also shows a partial sampling plan: sub-period 1 weekday samples for aerial data collection. The field team assignments in Exhibit A.1.5 were not randomized, but simply added at the end based on convenience.

Exhibit A.1.5. Partial Sampling Plan: Week 1 Weekday Samples for Ground Data Collection

DAY	GROUP/LOOP	SEGMENT	TIME	FIELD TEAM
Monday	G4L3	59	8:00 am	1
Monday	G4L3	64	10:45 am	1
Monday	G4L3	69	1:30 pm	1
Monday	G4L3	74	4:15 pm	2
Monday	G4L3	54	7:00 pm	2
Monday	G4L4	99	8:00 am	3
Monday	G4L4	79	10:45 am	3
Monday	G4L4	84	1:30 pm	3
Monday	G4L4	89	4:15 pm	4
Monday	G4L4	94	7:00 pm	4
Friday	G4L1	4	8:00 am	1
Friday	G4L1	9	10:45 am	1
Friday	G4L1	14	1:30 pm	2
Friday	G4L1	19	4:15 pm	2
Friday	G4L1	24	7:00 pm	2
Friday	G4L2	39	8:00 am	3
Friday	G4L2	44	10:45 am	3
Friday	G4L2	49	1:30 pm	4
Friday	G4L2	29	4:15 pm	4
Friday	G4L2	34	7:00 pm	4

Exhibit A.1.6. Partial Sampling Plan: Sub-Period 1 Weekday Samples for Aerial Data Collection

WEEK	DAY	TIME	LOCATION	GROUP
1	Monday	4:00 pm	Miami	4
1	Friday	8:00 am	Miami	4
2	Tuesday	12:00 pm	Cocoa Beach	4
2	Thursday	8:00 am	Cocoa Beach	4

Exhibit A.2. Example Interval Counts sampling design for Boating Sites

OVERVIEW

Imagine an oil spill has occurred off the coast of Alabama. There are 11 public access points for boaters that have potentially been affected by the spill. Based on the size of the spill and past experience, study managers want to understand any potential changes in boating use over the four-week period following the spill. The focus of the effort will be on impacts from 8:00 am to 8:00 pm, and a separate effort will be used to assess impacts at other times of day. Information about use at these sites is available from the Marine Recreational Information Program (MRIP), which is conducted by the National Marine Fisheries Service (NMFS). However, the available estimates do not cover the time period of interest with great precision. Therefore, study managers have decided to collect data at these sites to assess the impacts of the spill on boating use. Given the limited number of locations from which boats can depart each site and the offshore nature of boating, study managers have opted to use interval counts to collect the required information.

Study managers have four personnel available to collect data, who are not allowed to work more than eight hours per day. Further, staff must work in teams of two for safety reasons, meaning two teams of two are available for data collection. After consulting with the project team's statistician, study managers have determined that data will be collected at two sites on two weekdays and two weekend days each week. Monday through Friday are considered weekdays, while Saturday and Sunday are considered weekend days. Further, given the limited hours staff can work in a day, the sampling day is divided into two sampling units, a shift from 8:00 am to 2:00 pm and a shift from 2:00 pm to 8:00 pm. Data will be collected during one shift at a site on a sampled day. Over four weeks, this yields 32 total observations (i.e., four weeks x eight shifts per week).

STAGE 1 : SELECTING SITES

In the first stage, a subset of sites is selected for sampling. A total of 32 observations will be collected, or eight per week. Since there are 11 sites total and three have nearly zero use based on estimates in the MRIP data, the study managers decide to drop these three sites. As a result, any use at these three sites will be excluded in the final estimate.

STAGE 2: SELECTING DAYS

In the second stage, sampling days are selected. As described above, data will be collected at two sites on two weekdays and two weekend days each week. Since there are two field teams available for this effort, data will be collected at two sites per sampled day, meaning that all eight sites can be sampled once every two weeks within the weekday/weekend strata. To support this balanced approach, sampling is further stratified by two-week period.

The eight sites are organized into pairs based on proximity for additional safety (i.e., the two field teams will be closer together in case of an emergency). Sites 1 and 2 comprise Pair 1, Sites 3 and 4 comprise Pair 2, and so on. To enhance variability in the sample, the day of week for weekdays is selected without replacement in each two-week period across the pairs. Thus, if Monday of week one is chosen for Pair 1, Monday of week two is removed before the next weekday is selected for Pair 2, and so on.

Exhibit A.2.1 shows how Excel can be used to select days given the stratified random sampling approach described above. For simplicity, the exhibit only shows the selection of weekdays. Since two weekdays need to be selected from each week, the days are listed twice. The first weekday selected is for Pair 1, the second for Pair 2, and so on. Random numbers are assigned to all days using the RAND function in Excel. The random numbers within the set of days for each week are sorted from largest to smallest. The selected days are then bolded. The first selected weekday from Week 1 is Wednesday and the second selected weekday for Week 1 is Thursday. The first selected

weekday in Week 2 is Monday and the second selected weekday for Week 2 is Tuesday. Notice how the second selected weekday for Week 2 is the day with the highest random number that hasn't already been chosen as one of the first three weekdays across Weeks 1 and 2.

Exhibit A.2.1. Selection of Weekdays

WEEKS 1 AND 2 WEEKDAY SAMPLE DAYS		WEEKS 3 AND 4 WEEKDAY SAMPLE DAYS	
DAY	**RANDOM NUMBER**	**DAY**	**RANDOM NUMBER**
Wednesday, Week 1	**0.297907188**	**Monday, Week 3**	**0.965**
Thursday, Week 1	0.214971136	Thursday, Week 3	0.613
Monday, Week 1	0.213257732	Wednesday, Week 3	0.577
Friday, Week 1	0.049441668	Tuesday, Week 3	0.563
Tuesday, Week 1	0.023111547	Friday, Week 3	0.076
Thursday, Week 1	**0.964807756**	**Friday, Week 3**	**0.978**
Wednesday, Week 1	0.670355307	Wednesday, Week 3	0.941
Monday, Week 1	0.605003607	Monday, Week 3	0.920
Tuesday, Week 1	0.401895354	Thursday, Week 3	0.842
Friday, Week 1	0.329180042	Tuesday, Week 3	0.418
Monday, Week 2	**0.582687496**	**Wednesday, Week 4**	**0.821**
Wednesday, Week 2	0.567138523	Monday, Week 4	0.658
Thursday, Week 2	0.538198165	Tuesday, Week 4	0.604
Friday, Week 2	0.462357693	Friday, Week 4	0.276
Tuesday, Week 2	0.095973969	Thursday, Week 4	0.031
Wednesday, Week 2	0.794515156	Friday, Week 4	0.883
Monday, Week 2	0.778535294	Monday, Week 4	0.696
Tuesday, Week 2	**0.419094388**	Wednesday, Week 4	0.627
Friday, Week 2	0.327071184	**Thursday, Week 4**	**0.175**
Thursday, Week 2	0.207845653	Tuesday, Week 4	0.080

STAGE 3: SELECTING TIMES

In the third stage, sampling times are selected. There are two shifts: one from 8:00 am to 2:00 pm and one from 2:00 pm to 8:00 pm. Since data will be collected at each site twice on weekdays and twice on weekends during the four-week period, the shifts can be balanced across the two sample days within weekday/weekend strata. One of the two shifts is randomly selected without replacement for the first sample day and the other is then selected for the other sample day.

Exhibit A.2.2 shows how Excel can be used to select shifts given the stratified random sampling approach described above. For simplicity, the exhibit only shows the selection of shifts on weekdays. The two shifts are listed for each pair on the days selected for sampling. Random numbers are assigned to all pair-day-shift combinations. The random numbers are sorted largest to smallest within each pair and shifts are selected for each sampling day.

Exhibit A.2.2. Selection of Weekday Times

PAIR	DAY	SHIFT	RANDOM NUMBER
Pair 1 (Sites 1 and 2)	Wednesday, Week 1	8:00 am - 2:00 pm	0.398
Pair 1 (Sites 1 and 2)	Monday, Week 3	2:00 pm - 8:00 pm	0.263
Pair 2 (Sites 3 and 4)	Thursday, Week 1	2:00 pm - 8:00 pm	0.817
Pair 2 (Sites 3 and 4)	Friday, Week 3	8:00 am - 2:00 pm	0.048
Pair 3 (Sites 5 and 6)	Monday, Week 2	2:00 pm - 8:00 pm	0.751
Pair 3 (Sites 5 and 6)	Wednesday, Week 4	8:00 am - 2:00 pm	0.243
Pair 4 (Sites 7 and 8)	Tuesday, Week 2	8:00 am - 2:00 pm	0.647
Pair 4 (Sites 7 and 8)	Thursday, Week 4	2:00 pm - 8:00 pm	0.629

FINALIZING THE SAMPLING PLAN

The sampling plan is finalized by transposing the various randomized sampling dimensions from Excel into tabular format. It is customary to sort the table by day and time. Exhibit A.2.3 shows the sampling plan for weekday samples only. The field team assignments were not randomized, but simply added at the end based on convenience.

Exhibit A.2.3. Partial Sampling Plan: Weekday Samples

WEEK	DAY	TIME	SITE	FIELD TEAM
1	Wednesday	8:00 am to 2:00 pm	Site 1	1
1	Wednesday	8:00 am to 2:00 pm	Site 2	2
1	Thursday	2:00 pm to 8:00 pm	Site 3	1
1	Thursday	2:00 pm to 8:00 pm	Site 4	2
2	Monday	2:00 pm to 8:00 pm	Site 5	1
2	Monday	2:00 pm to 8:00 pm	Site 6	2
2	Tuesday	8:00 am to 2:00 pm	Site 7	1
2	Tuesday	8:00 am to 2:00 pm	Site 8	2
3	Monday	2:00 pm to 8:00 pm	Site 1	1
3	Monday	2:00 pm to 8:00 pm	Site 2	2
3	Friday	8:00 am to 2:00 pm	Site 3	1
3	Friday	8:00 am to 2:00 pm	Site 4	2
4	Wednesday	8:00 am to 2:00 pm	Site 5	1
4	Wednesday	8:00 am to 2:00 pm	Site 6	2
4	Thursday	2:00 pm to 8:00 pm	Site 7	1
4	Thursday	2:00 pm to 8:00 pm	Site 8	2

Appendix B. Example Data Collection Procedures

Exhibit B.1. Example Instantaneous Count and Interview Procedures for Shoreline Use Sites

INTRODUCTION

Shoreline use sites are organized into loops of sites. A team of two people will be assigned to conduct counts and interviews at all sites within a shoreline loop on a given day according to the schedule you were provided. The team will conduct a count of people potentially engaged in recreation at each site. The objective of the counts is to record the total number of people potentially engaged in recreation between the starting and ending boundaries of the site. The team will also conduct interviews at each site. The boundaries for each site are described in the site-specific protocols.

COUNT PROCEDURE

Both team members walk the full extent of the site and each team member counts the total number of potential recreators within the site boundaries. People identified as "potential recreators" include anyone who could possibly be engaged in recreation. Examples of people who are not potential recreators include lifeguards, people dressed in spill response uniforms, food vendors, and hotel staff.

Two separate counts will be conducted: one of "beach recreators" and one of "water recreators". Both team members will conduct independent counts of beach and water recreators. Beach recreators consist of all people potentially engaged in recreation on the beach, while water recreators consist of all people potentially engaged in recreation in the water. A recreator is considered to be in the water if any part of his or her body is touching the water.

To count potential recreators at a shoreline recreation site, team members should walk the length of the site and record on their hand-held counters each time they pass a potential recreator. This should be done once for potential recreators in the water and then a second time for potential recreators on the beach. Specifically, one team member should walk slightly ahead of the other, and both team members should imagine a line extending out from their left and right side, perpendicular to the path they are walking. They should record on their hand-held counters each time the imaginary line passes a potential recreator located within the boundaries of the site.

If the water or beach counts recorded by the two team members differ by more than 10% of the average of the two counts, a recount is necessary. If a recount is necessary, repeat the count of potential recreators and compare the counts. Continue until no further recounts are necessary. Record the final counts on the count sheet. The date, time, and location of the count is also recorded on the count sheet, along with your name.

If foul weather prevents a count from being conducted at the scheduled time, wait 15 minutes for the weather to clear. If after 15 minutes the weather has not improved enough to safely conduct counts, proceed to the next site and begin counts at the scheduled time for that site. If data cannot be collected due to inclement weather, or due to another reason, this should be recorded on the count sheet.

DETERMINING THE INTERVIEW FREQUENCY

Next determine the frequency with which interviews will be conducted on the beach and record the frequency on your count sheet. Interviews will not be conducted with potential recreators in the water. If the beach count is fewer than 10, conduct interviews with every potential beach recreator. If the beach count is 10 or more but fewer than 30, conduct interviews with every 3rd potential recreator. If the beach count is 30 or more but fewer than 150, conduct interviews with every 5th potential recreator. If the beach count is 150 or more, conduct interviews with every 10th potential recreator. For the purpose of determining how frequently to conduct interviews, the beach count is assumed to be the lower of the two beach counts recorded by the two team members.

If the beach count is greater than 300, and if conducting interviews with every 10th potential recreator is likely to cause the team to reach their next site later than the prescribed time, interviews may be conducted with a frequency lower than every 10th person. To calculate the appropriate frequency, divide the beach count by 30 and round down to calculate N. Then conduct interviews with every Nth potential recreator. For example, if the beach count is 500, divide 500 by 30 to get 16.6, which rounds down to 16. Then conduct interviews with every 16th potential recreator.

INTERVIEW PROCEDURE

Interviews are conducted on the beach while walking the site for a third time. If you are conducting interviews with every potential recreator at a site, begin walking and attempt an interview with the first potential recreator you encounter. Then continue to the next potential recreator, and so on, until you reach the opposite boundary of the site. If you are conducting interviews with every 3rd potential recreator, attempt an interview with the first potential recreator you encounter and every 3rd potential recreator thereafter.[1] The same procedure should be used for conducting interviews with every 5th, 10th, or other frequency of potential recreators. Interviews should be conducted by reading each question exactly as written on the interview form and recording the responses.

Interviews will be conducted only with people who appear to be 16 years of age or older. If, based on the interview frequency for a site, you encounter someone who is supposed to be interviewed but who appears to be younger than 16, record this type of nonresponse on the interview form and proceed to the next person in the interview sequence. For example, suppose you are planning to conduct interviews with the 1st, 4th, 7th, and 10th person along an interview route. If the 4th person is under 16, you would instead complete an interview with the 1st, 7th, and 10th person. For the 4th person, you would record the nonresponse type “R under 16” on your interview form. The same approach should be used for other forms of non-response listed on the interview form (i.e., refused, language barrier, not approachable, and other).[2]

———————————————

[1] A note to the reader: a random draw sheet (i.e., a sheet with the numbers “1”, “2”, and “3” listed consecutively over and over again) may also be used to randomly select one of the first three potential recreators, and then the interviews continue with every 3rd potential recreator thereafter. Field staff can cross off a number on the random draw sheet as it is used.

[2] A note to the reader: a separate nonresponse log can be used in place of recording nonresponse on the interview forms. For example, the log could contain the different types of nonresponse, and interviewers could tally the number of non-respondents by type.

The procedures for shore fishing sites may be written like those for shoreline use sites, but with the following modifications:

- “Potential anglers” (rather than “potential recreators”) include anyone who could possibly be engaged in fishing (i.e., people with poles or other fishing gear) within 30

feet of the shoreline and in the water between the starting and ending boundaries of the site. Examples of people who are not potential anglers include joggers, people swimming, people in bathing suits sunbathing, or people dressed in spill response uniforms.

- Interviews are conducted with potential anglers within 30 feet of the water (i.e., on the land) who are accessible. Potential anglers who are inaccessible include those fishing from rocky jetties or other areas on the land that cannot be accessed safely.

Exhibit B.2. Example Interval Count and Interview Procedures for Boating Sites

INTRODUCTION

The general approach to counting at designated boat launch and marina sites is that all boat departures from the facility will be counted over a specified period of time. Interviews with departing boats will also be conducted. For all morning shifts, a count of vehicles with empty trailers in the parking area will also be conducted prior to counting departing boats and interviewing individuals onboard. The sites and times are given in the schedule you were provided. Data collection will be conducted by teams of two or more people, depending on the site. The boundaries and observer-specific assignments (i.e., counts and/or interviews) for each site are described in the site-specific protocols.

COUNT PROCEDURE – PARKING LOT

Prior to a morning shift, two team members shall each conduct a count of vehicles with empty trailers in the parking area specified on the site-specific protocol. If the count differs by more than 10% of the average, a recount is necessary. If a recount is necessary, repeat the count of vehicles with empty trailers and compare the counts. Continue until no further recounts are necessary. Record the final count on the count sheet. If your shift is not a morning shift, simply record "NA" for this count. The date and location of the count is also recorded on the count sheet, along with your name.

COUNT PROCEDURE – BOAT DEPARTURES

This section is relevant to field staff responsible for counting boat departures. The observer responsibilities are defined in the site-specific protocol for each site. Record your observer number from the site-specific protocol and the areas you are monitoring on your count sheet. Boating areas vary by site and include the following:

- Boat ramp – where boats on a trailer are backed by vehicle down a ramp and launched into the water;
- Wet slips – where boats are tied up to a dock and either sit in the water or are suspended directly above the water. Wet slips are like reserved parking spaces on the water with access by foot along a dock;
- Forklift/launch from dry storage – where boats stored on land are lowered directly into the water. This type of access does not include boats from dry storage that are launched at a boat ramp, which would be included in "Boat ramp";
- Dock or landing area – where transient boats arrive at a site by water and leave by water. For example, boats may arrive to refuel and then depart;
- Choke point – where boats leave a defined area through a channel where they can be monitored and counted; and

- Other area – At certain sites other boat departure areas are specified in the protocols for the site, and these areas should be specified on the count sheet using the term provided in the site protocols.

If you are counting boat departures in a wet slip area, count the number of boats occupying the wet slips area to which you are assigned prior to your shift and record the number as indicated on your count sheet. You will perform a count of boats in wet slips again at the end of your shift.

Record the start time on your count sheet when you begin observing boat departures from your designated position. You will record the end time when you stop monitoring departures using this count sheet. Record an entry on your count sheet for each boat that departs from the point or area you are monitoring. For ramps, wet slips, forklift/launch, and dock/landing areas, a boat departs when it begins moving under its own power. For these areas, do not record a departure if a boat has already begun moving prior to the beginning of your shift or if it has not yet begun moving when your shift ends. For choke points, a boat departs when it passes through the choke point. If no boats departed during your shift, write “NO DEPARTURES” in the first entry under “Boat Departures”.

If anything occurs that affects your ability to accurately record all boat departures from your assigned areas (e.g., inclement weather, bathroom break), take careful notes describing the details on your count sheet.

INTERVIEW PROCEDURE

This section is relevant to field staff responsible for conducting interviews. The observer responsibilities are defined in the site-specific protocol for each site. Interviews will be conducted with one person from each boating party preparing to depart from your assigned area(s). A boating party is defined as the person or entire group of people on board a given boat or preparing to board a given boat. Interviews should be conducted by reading each question exactly as written on the interview form and recording the responses.

To ensure unbiased selection of one of the individuals in the boating party, ask to speak with the person in the party who most recently had a birthday. If this person is unavailable or is not identified, ask to speak with the person who had the most recent birthday from among those who are available for an interview. If only one person is available to be interviewed, conduct an interview with this person. Interviews will only be conducted with people who appear to be 16 years of age or older. When asking to speak with the person who most recently had a birthday, it may be appropriate to clarify that your question applies only to those 16 and older. If no one in the boating party is 16 years old or older, record this type of nonresponse on the interview form and proceed to conduct your next interview. The same approach should be used for other forms of non-response listed on the interview form (i.e., refused, language barrier, left too quickly, already interviewed today, and other).

Exhibit B.3. Example Aerial Overflight Procedures for collecting aerial photographs

INTRODUCTION

The general approach to conducting aerial overflights is to take high-definition aerial photographs that record recreational use levels in coastal areas along the designated flight path. The starting location and time of each overflight are given in the schedule you were provided. Overflights will be conducted in a fixed-wing aircraft with one pilot and one photographer.

COVERAGE AREA AND TIMES

Overflights will be conducted along the Gulf of Mexico coastline between Hernando Beach and Marco Island, Florida (Figure 1). The overflight path includes sandy beach areas along the mainland shoreline and does not include shoreline along inland bays. There are two starting locations found in the schedule: 1) Hernando Beach (overflight is conducted north to south) and 2) Marco Island (overflight is conducted south to north). The starting times in the schedule range from 8:00 am to 4:00 pm.

Figure 1. Overflight Path

PROTOCOL FOR AERIAL PHOTOGRAPHY

The protocol for conducting overflights for the purpose of collecting aerial photographs includes the following rules:

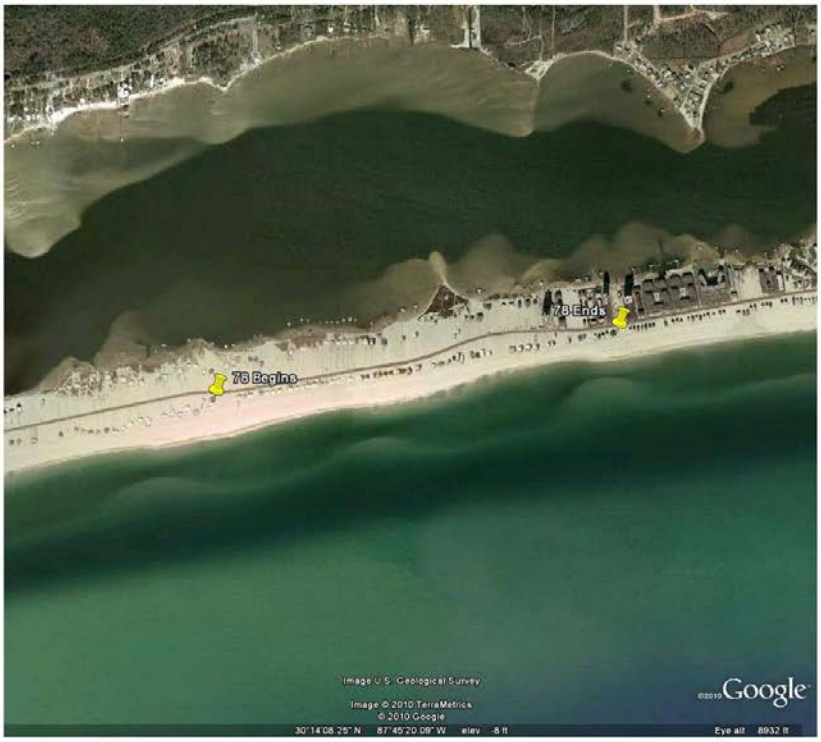
- Flights that cannot begin at the designated starting point within one hour of the designated starting time should be canceled. If the pilot encounters weather conditions during the course of a flight that do not permit the pilot to adhere to the prescribed route, the pilot is given discretion to bypass the portion of the route that is affected by adverse weather conditions. If changing weather conditions permit, the pilot will return to the area that was bypassed within one hour of the initial rerouting to take pictures of the shoreline that was missed. All deviations from the usual flightpath shall be documented in a flight log.
- Photographs of the shoreline shall be taken at a minimum resolution of 5616 pixels wide by 3744 pixels high and be captured in JPEG files of 21.1 megapixels.
- Photographs shall be taken from an altitude of approximately 600 feet above ground and approximately 750 feet offshore.
- Photographs shall be taken at a rate of approximately three per second to ensure sufficient overlap across photographs.
- Photographs shall include the full extent of sandy beach up to an adjacent road, buildings, or other boundary, and include areas adjacent to the sandy beach where recreation may occur, such as boardwalks, picnic areas, or other outdoor recreational facilities. The photographs shall also include any portions of the water along the sandy beach where people are likely to be engaged in activities such as swimming or kayaking, up to approximately 100 yards offshore.
- A GPS unit connected to the camera shall be used to track the time and coordinate location of each photograph taken.

HANDLING AND SUBMITTING DATA

The JPEG images, photograph coordinates and times, and flight logs shall be saved to a large capacity hard drive. After every 20 overflights, the hard drive shall be given to a study supervisor following chain of custody procedures.

Appendix C. Example Site-Specific Protocols

Shoreline Segment #78
(Example Shoreline Site-Specific Protocol)



Conduct counts and interviews seaward from the point where the vegetation line meets the sandy beach. In areas where private residences/patios are directly adjacent to the sandy beach, conduct counts and interviews seaward from those private residences/patios.

ABC Warehouse allows field staff members to park in front of the vacant residency at 2353 Perdido Beach Blvd. Contact Xxxxx Xxxxx with any question at (###) ###-####.

Page 1

The beginning of this site is along the invisible red line extending from the east side of the red-roofed house. The approximate coordinates for a point along the boundary line are 30° 14′ 13.62″ N, 87° 45′ 51.08″ W.

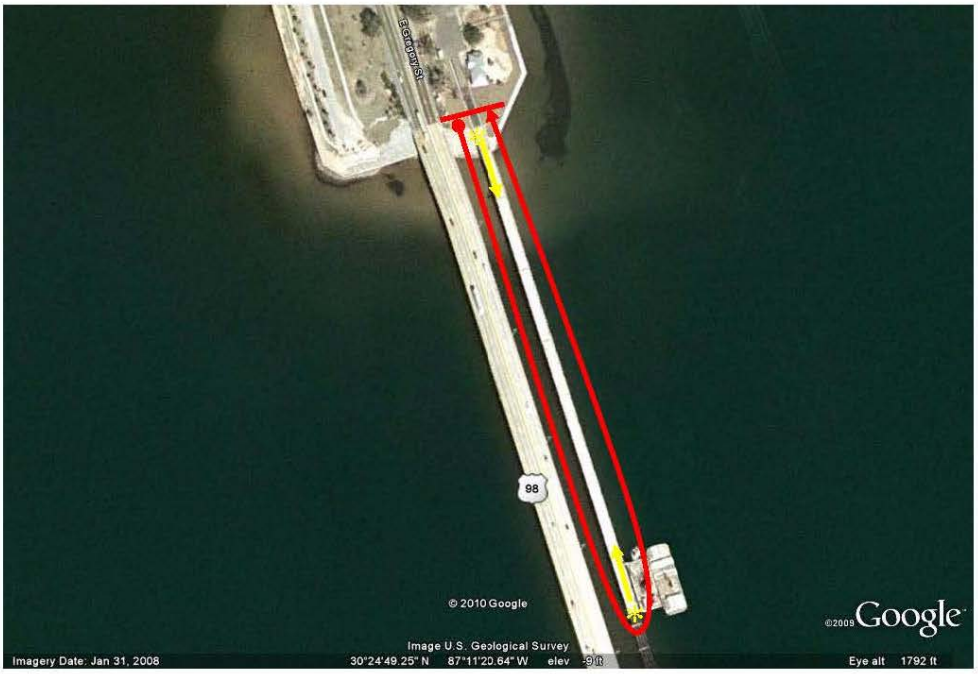
Page 2

The ending boundary of this site is along the invisible red line extending from the east side of the house with the brown roof. The approximate coordinates for a point along the boundary line are 30° 14' 22.38" N, 87° 44' 52.98" W.

Page 3

Pensacola Bay Fishing Bridge / Site #352
(30° 24' 53.224" N, 87° 11' 31.890" W)
(Example Shore Fishing Site-Specific Protocol)

The beginning and ending points of this site are at the base of the abandoned bridge. Note that the route follows the right-hand edge of the bridge running out to the south end of the bridge and back to the north end. Conduct counts and interviews along this route. The yellow asterisks indicate the locations where photos should be taken and the yellow arrows indicate the direction.



Anclote River Park / Site #104
(28° 10' 33.37" N, 82° 47' 12.81" W)
(Example Boating Site-Specific Protocol)

Check in with park staff on duty.

Please arrive to this site 15 minutes prior to a morning shift on weekdays or 30 minutes prior to a morning shift on weekends to conduct the vehicle count in the parking area outlined in yellow.

Observer #1 counts departures from the boat ramp and conducts interviews. Observer #2 counts departures from the area outlined in red, including the dock/landing areas for transient boats, and conducts interviews. Observer #3 conducts interviews at the boat ramp and in the area outlined in red. When this site is sampled with an additional observer on a Friday, Saturday, or Sunday, observer #4 conducts interviews at the boat ramp and in the area outlined in red.

Appendix D. Example Datasheets

Shoreline Use Count Sheet

Name:	
Site # and Name:	
Date:	State:

Record the time when you begin sampling at the site:

_____ am/pm

Record the total number of potential recreators in the water at the site: _____

Record the total number of potential recreators on the beach at the site: _____

Record the frequency with which beach interviews will be conducted:

1) Every potential recreator
2) Every 3rd potential recreator
3) Every 5th potential recreator
4) Every 10th potential recreator
5) Other (specify _____)

COMMENTS:

FIELD DESCRIPTIONS

NAME: Name of field staff collecting data

SITE NUMBER AND NAME: Site number and name from site-specific protocol

DATE: Date of data collection

TIME: Time when begin sampling at site

WATER COUNT: The number of potential rcereators in the water

BEACH COUNT: The number of potential rcereators on the beach

INTERVIEW FREQUENCY: Frequency at which interviews were conducted

COMMENTS: Record any conditions at the site that appear unusual, especially anything that could affect the number of recreators using the site. Examples include, but are not limited to, the presence of spill cleanup operations or special events or attractions. If data cannot be collected due to inclement weather or another reason, these reasons should be recorded here.

Shoreline Use Interview Form

Name:	
Site # and Name:	
Date:	State:

IF INTERVIEW NOT CONDUCTED, PROVIDE REASON:

1) Respondent refused
2) Respondent under 16
3) Language barrier
4) Respondent not approachable
5) Other (specify: _____)

RECORD RESPONDENT GENDER:

1) Male
2) Female

RECORD TIME OF INTERVIEW: _____ am/pm

RECORD AREA WHERE INTERVIEW TOOK PLACE *(Circle one)*:

1) Sandy beach
2) Pier
3) Pavement area
4) Boardwalk
5) Other (specify _____)

RECORD INTERVIEW FREQUENCY:
Every _____ potential recreator

Note: Draw a line through any refused questions, below.

---

1) **Hello, my name is _____. I'm working with state and federal agencies and we are collecting information about recreational activities in this area. Could you tell me what activities you will take part in during your visit here today?** (*Circle all that apply*)

1) Sunbathing
2) Swimming
3) Walking
4) Sightseeing
5) Wildlife viewing
6) Hiking
7) Picnicking
8) Canoeing/kayaking
9) Fishing
10) Shellfishing
11) Crabbing
12) Motor boating or boat-based fishing GO TO QUESTION 11
13) Other (specify: _____)

2) **At what time did you first arrive here today?** Time: _____ am/pm

3) **How much longer do you expect to be here today?** _____hrs _____ mins

4) **Is your visit here today part of a trip away from home lasting more than one day?**

1 YES ⟶ **4a) How many days will your trip last in total?** _____ days

4b) Is recreation, such as [RESPONSE FROM QUESTION 1], the main reason for your trip?

1 YES

2 NO

2 NO

5) **Before today, were you aware or unaware of the oil spill that occurred [INSERT GEOGRAPHY AND TIMEFRAME]?**

1 AWARE OF SPILL

2 UNAWARE OF SPILL GO TO QUESTION 11

6) **Did the oil spill affect where you decided to go today or did it not affect where you decided to go?**

1 SPILL DID AFFECT WHERE RESPONDENT DECIDED TO GO

6a) **Which site would you have gone to if the spill had not occurred?**

_____

2 SPILL DID NOT AFFECT WHERE RESPONDENT DECIDED TO GO

7) **Did the oil spill affect what you decided to do on your trip today or did it not affect what you decided to do?**

1 SPILL DID AFFECT WHAT RESPONDENT DECIDED TO DO

7a) **How did the oil spill affect what you decided to do today?**

_____

2 SPILL DID NOT AFFECT WHAT RESPONDENT DECIDED TO DO

8) **Do you think the condition of this beach is better, worse, or about the same as it was before the spill?**

1 BETTER THAN IT WAS BEFORE GO TO QUESTION 11
2 WORSE THAN IT WAS BEFORE
3 ABOUT THE SAME GO TO QUESTION 11
4 DON'T KNOW GO TO QUESTION 11

9) **In what way is the condition of this beach worse?**

1 MORE OIL OR TAR BALLS
2 APPEARANCE OR ODOR
3 IMPACT ON FISH OR WILDLIFE
4 LOWER QUALITY RECREATION
5 HUMAN HEALTH IMPACTS
6 OTHER (*specify*: _____)
7 DON'T KNOW

10) **About how long do you think it will be until this beach is about the same as it was before the spill?**

1 _____ (*Circle one:* weeks/months/years)
2 DON'T KNOW

11) **What town or city are you from?**

Town/City: _____
State/Province: _____
Country: _____
Zip/Post Code: _____

Thank you!

FIELD DESCRIPTIONS AND INSTRUCTIONS

NAME: Name of field staff collecting data

SITE NUMBER AND NAME: Site number and name from site-specific protocol

DATE: Date of data collection

STATE: State where site is located

NONRESPONSE: Reason interview was not completed. Respondents who are sleeping, talking on a cell phone, jogging, etc. are not approachable.

GENDER: Observed gender of respondent.

INTERVIEW TIME: Time of interview

INTERVIEW LOCATION: Location where interview was conducted.

INTERVIEW FREQUENCY: Frequency at which interviews were conducted

Read each question exactly as it appears on the interview form and record the responses.

Shore Fishing Count Sheet

Name:	
Site # and Name:	
Date:	State:

Record the time when you begin sampling at the site:

_____ am/pm

Record the total number of potential anglers in the water at the site: _____

Record the total number of potential anglers on the beach at the site: _____

Record the frequency with which beach interviews will be conducted:

1) Every potential angler
2) Every 3rd potential angler
3) Every 5th potential angler
4) Every 10th potential angler
5) Other (specify _____)

COMMENTS:

FIELD DESCRIPTIONS

NAME: Name of field staff collecting data

SITE NUMBER AND NAME: Site number and name from site-specific protocol

DATE: Date of data collection

TIME: Time when begin sampling at site

WATER COUNT: The number of potential anglers in the water

BEACH COUNT: The number of potential anglers on the beach

INTERVIEW FREQUENCY: Frequency at which interviews were conducted

COMMENTS: Record any conditions at the site that appear unusual, especially anything that could affect the number of anglers using the site. Examples include, but are not limited to, the presence of spill cleanup operations or special events or attractions. If data cannot be collected due to inclement weather or another reason, these reasons should be recorded here.

Shore Fishing Interview Form

Name:	
Site # and Name:	
Date:	State:

IF INTERVIEW NOT CONDUCTED, PROVIDE REASON:

1) Respondent (R) refused
2) R under 16
3) Language barrier
4) R inaccessible
5) R not approachable
6) Other (specify: _____)

RECORD RESPONDENT GENDER:

1) Male
2) Female

RECORD TIME OF INTERVIEW: _____ am/pm

RECORD INTERVIEW FREQUENCY:

Every _____ potential angler

Note: Draw a line through any refused questions, below.

---

1) Hello, my name is _____. I'm working with state and federal agencies and we are collecting information about recreational activities in this area. Could you tell me what activities you will take part in during your visit here today? (*Circle all that apply*)

1) Fishing with rod and reel
2) Shrimping
3) Crabbing
4) Other Shellfishing (Oysters, etc)
5) Other fishing (specify: _____)
6) Boating or boat-based fishing of any type
7) Walking
8) Wildlife viewing
9) Sightseeing
10) Some other activity (specify: _____)

If ANY activities in 1-5 GO TO QUESTION 2

If NO activities in 1-5 GO TO QUESTION 12

2) At what time did you first arrive here today? Time: _____ am/pm

3) How much longer do you expect to be here today? _____hrs _____ mins

4) Is your visit here today part of a trip away from home lasting more than one day?

1 YES → **4a) How many days will your trip last in total?** _____ days

4b) Is recreation, such as fishing, the main reason for your trip?

1 YES

2 NO

2 NO

5) Before today, were you aware or unaware of the oil spill that occurred [INSERT GEOGRAPHY AND TIMEFRAME]?

1 AWARE OF SPILL

2 UNAWARE OF SPILL GO TO QUESTION 12

6) Did the oil spill affect where you decided to fish today or did it not affect where you decided to fish?

1 SPILL DID AFFECT WHERE RESPONDENT DECIDED TO FISH

6a) Which site would you have gone to if the spill had not occurred?

_____

2 SPILL DID NOT AFFECT WHERE RESPONDENT DECIDED TO FISH

7) Did the oil spill affect what you decided to do on your trip today or did it not affect what you decided to do?

1 SPILL DID AFFECT WHAT RESPONDENT DECIDED TO DO

7a) How did the oil spill affect what you decided to do today?

_____

_____

2 SPILL DID NOT AFFECT WHAT RESPONDENT DECIDED TO DO

8) Has the oil spill affected your enjoyment of this site today or has it not affected your enjoyment of this site?

1 SPILL DID AFFECT RESPONDENT'S ENJOYMENT OF SITE

8a) How did the oil spill affect your enjoyment of this site?

_____

_____

2 SPILL DID NOT AFFECT RESPONDENT'S ENJOYMENT OF SITE

9) Do you think conditions at this site are better, worse, or about the same as they were before the spill?

1 BETTER THAN BEFORE	GO TO QUESTION 12
2 WORSE THAN BEFORE	
3 ABOUT THE SAME	GO TO QUESTION 12
4 DON'T KNOW	GO TO QUESTION 12

10) In what way are conditions worse? (*Circle all that apply*)

1 MORE OIL OR TAR BALLS

2 APPEARANCE OR ODOR

3 IMPACT ON FISHING OR CATCH RATES

4 OTHER (*specify*: _____)

5 DON'T KNOW

11) About how long do you think it will be until conditions at this site are about the same as they were before the spill?

1 _____ (*Circle one*: weeks/months/years)

2 DON'T KNOW

12) What town or city are you from?

Town/City: _____

State/Province: _____

Country: _____

Zip/Post Code: _____

Thank you!

FIELD DESCRIPTIONS AND INSTRUCTIONS

NAME: Name of field staff collecting data

SITE NUMBER AND NAME: Site number and name from site-specific protocol

DATE: Date of data collection

STATE: State where site is located

NONRESPONSE: Reason interview was not completed. Respondents who are inaccessible include those fishing from rocky jetties or other areas on the land that cannot be accessed safely. Respondents who are sleeping, talking on a cell phone, jogging, etc. are not approachable.

GENDER: Observed gender of respondent.

INTERVIEW TIME: Time of interview

INTERVIEW LOCATION: Location where interview was conducted

Read each question exactly as it appears on the interview form and record the responses.

Boat Departure Count Sheet

Name:	
Site # and Name:	
Date:	State:

Parking lot count: conduct at beginning of morning shift

Vehicles with empty trailer: _____

Review the protocol for this site and enter the observer number that describes the monitoring activities you are responsible for during your shift: Observer # _____

Record what boating area(s) you are monitoring during your shift *(Circle all that apply):*

1) Boat ramp
2) Wet slips
3) Forklift/launch from dry storage
4) Dock or landing area for transient boats
5) Choke point
6) Other (specify _____)

Record what task(s) you are responsible for during your shift *(Circle all that apply):*

1) Monitoring boat departures
2) Conducting interviews

Enter the number of boats in wet slips at the beginning of your shift and at the end of your shift. Enter NA if you are not monitoring wet slips.

Number of boats in wet slips at beginning of shift _____

Number of boats in wet slips at end of shift _____

Enter the time when you begin monitoring boat departures using this sheet. After your shift, when you have filled up this sheet, or if you stop monitoring boat departures for any reason, enter the time when you stop monitoring boat departures using this sheet.

Time when begin monitoring boat departures _____ am/pm

Time when stop monitoring boat departures _____ am/pm

Boat Departures

Entry number	Departure time	Type of boat*	Area where departure was observed**	Transient Boat***
				Y N
				Y N
				Y N
				Y N
				Y N
				Y N
				Y N

*SM=Small motorboat (no cabin), LM=large motorboat (with cabin), SS=small sailboat (no cabin), LS=large sailboat (with cabin), JS=jet ski, CK=canoe/kayak, or specify other type of boat

**BR=Boat ramp, WS=wet slip, FL=forklift/launch from dry storage, DL=dock or landing area for transient boats, or CP=choke point

***Circle Y if boat arrived by water prior to departing. Circle N if boat did not arrive by water.

Boat Departures

Entry number	Departure time	Type of boat*	Area where departure was observed**	Transient Boat***
				Y N
				Y N
				Y N
				Y N
				Y N
				Y N
				Y N
				Y N
				Y N
				Y N
				Y N
				Y N
				Y N
				Y N
				Y N
				Y N
				Y N
				Y N
				Y N
				Y N
				Y N
				Y N
				Y N
				Y N
				Y N

*SM=Small motorboat (no cabin), LM=large motorboat (with cabin), SS=small sailboat (no cabin), LS=large sailboat (with cabin), JS=jet ski, CK=canoe/kayak, or specify other type of boat

**BR=Boat ramp, WS=wet slip, FL=forklift/launch from dry storage, DL=dock or landing area for transient boats, or CP=choke point

***Circle Y if boat arrived by water prior to departing. Circle N if boat did not arrive by water.

COMMENTS:

FIELD DESCRIPTIONS

NAME: Name of field staff collecting data

SITE NUMBER AND NAME: Site number and name from site-specific protocol

DATE: Date of data collection

STATE: State where site is located

VEHICLES WITH EMPTY TRAILER: Number of vehicles with empty trailer

OBSERVER #: Observer number from site-specific protocol

BOATING AREA(S) BEING MONITORED: (See area descriptions in data collection procedures)

TASKS RESPONSIBLE FOR DURING SHIFT: Counting departures and/or conducting interviews

BEGIN WETSLIP COUNT: Number of boats in wetslips at beginning of shift

END WETSLIP COUNT: Number of boats in wetslips at end of shift

BEGIN TIME OF MONITORING: Time field staff started monitoring departures

END TIME OF MONITORING: Time field staff ended monitoring departures

ENTRY NUMBER: Unique departure entry number

DEPATURE TIME: Time when departure occurred

TYPE OF BOAT: Type of boat (see datasheet for further instructions)

AREA WHERE DEPARTURE WAS OBSERVED: Area from which boat departed (see datasheet for further instructions)

TRANSIENT BOAT: Indicates whether or not boat was transient (see datasheet for further instructions). A transient boat is a boat that arrives by water prior to departing by water. For example, a boat may enter a marina from the water to refuel at a dock/landing area.

COMMENTS: Record any conditions at the site that appear unusual, especially anything that could affect the number of boats departing from the site. Examples include, but are not limited to, the presence of spill cleanup operations, flooding, or a boat ramp that is being repaired. If anything occurs that affects your ability to accurately record all boat departures from your assigned areas (e.g., inclement weather, bathroom break), take careful notes describing the details here.

Boat Departure Interview Form

Name:	
Site # and Name:	
Date:	State:

IF INTERVIEW NOT CONDUCTED, PROVIDE REASON:
1) Respondent (R) refused
2) R under 16
3) Language barrier
4) Respondent left too quickly
5) Party already interviewed today
6) Other (specify: _____)

RECORD RESPONDENT GENDER:
1) Male
2) Female

RECORD TIME OF INTERVIEW: _____ am/pm

TRANSIENT BOAT DEPARTURE (Circle one): YES / NO

RECORD AREA WHERE INTERVIEW TOOK PLACE (*Circle one*):
1) Boat ramp
2) Wet slips
3) Forklift/launch from dry storage
4) Dock or landing area for transient boats
5) Other (specify _____)

RECORD TYPE OF BOAT (*Circle one*):
1) Small motorboat
2) Large motorboat
3) Small sailboat
4) Large sailboat
5) Jet ski
6) Canoe/Kayak
7) Other (specify _____)

Note: Draw a line through any refused questions, below.

Hello, my name is ____. I'm working on behalf of state and federal agencies and we are collecting information about boating in this area. (IF MORE THAN 1 MEMBER OF GROUP: We are trying to get opinions from all kinds of people and would like to speak to a randomly selected person in your group. Could I speak with the person in your group who most recently had a birthday?)

1) Is your trip today for recreation or for some other purpose? (*Circle* 1 RECREATION *or* 2 OTHER PURPOSE)

1 RECREATION →

1a) What types of recreation will you engage in today? (*Circle all that apply*)
1) Fishing
2) Shrimping
3) Crabbing
4) Shellfishing
5) Pleasure boating
6) Hunting
7) Something else (specify: _____)

1b) Is your trip today on a private boat or a charter boat? (*Circle one*)
(IF NECESSARY, SAY: FOR OUR STUDY, A CHARTER BOAT INCLUDES ANY BOAT THAT TAKES PEOPLE OUT FOR A FEE, FOR FISHING, DIVING, OR OTHER RECREATIONAL ACTIVITIES.)
1) Private boat — CONTINUE TO QUESTION 2
2) Charter boat — THANK RESPONDENT AND END SURVEY

2 OTHER PURPOSE →

1c) What purpose is that? (*Circle all that apply*)
1) Commercial fishing — THANK RESPONDENT AND END SURVEY
2) Responding to the oil spill — THANK RESPONDENT AND END SURVEY
3) Working on a charter fishing boat — THANK RESPONDENT AND END SURVEY
4) Some other activity (specify: _____) THANK AND END SURVEY

2) Including yourself, how many people are going out on your boat today? _____ people

3) Where do you plan to go on your boat today? _____

3a) IF A SPECIFIC LOCATION IS GIVEN IN QUESTION 3, BUT IT IS NOT CLEAR WHETHER THE LOCATION IS PART OF A STATE OR NATIONAL PARK/RESERVE/SANCTUARY, ASK: Is this location part of a State park or reserve, or a National Park, National Seashore, National Wildlife Refuge or National Marine Sanctuary?

1 YES (specify: _____)

2 NO

3 DO NOT KNOW

4) **Is your visit here today part of a trip away from home lasting more than one day?**

1 YES → **4a) How many days will your trip last in total?** _____ days

4b) Is recreation, such as fishing or boating, the main reason for your trip?

1 YES

2 NO

2 NO

5) **IF NUMBER OF PEOPLE IN BOATING PARTY IS GREATER THAN ONE, ASK: Are any of the other people who are going boating with you today taking part in a trip away from home lasting more than one day?**

1 YES → **5a) How many people?** _____ people

2 NO

6) **Before today, were you aware or unaware of the oil spill that occurred [INSERT GEOGRAPHY AND TIMEFRAME]?**

1 AWARE

2 UNAWARE GO TO QUESTION 12

7) **Did the oil spill affect where you decided to launch your boat today or did it not affect where you decided to launch your boat?**

1 SPILL DID AFFECT WHERE RESPONDENT DECIDED TO LAUNCH BOAT

7a) Where would you have gone if the oil spill had not occurred? _____

2 IT DID NOT AFFECT WHERE RESPONDENT DECIDED TO LAUNCH BOAT

8) **Did the oil spill affect what you decided to do on your trip today or did it not affect what you decided to do?**

1 SPILL DID AFFECT WHAT RESPONDENT DECIDED TO DO

8a) How did the spill affect what you decided to do today? _____

_____

2 SPILL DID NOT AFFECT WHAT RESPONDENT DECIDED TO DO

9) **Do you think conditions for [ACTIVITY FROM 1a] are better, worse, or about the same as they were before the spill?**

1 BETTER THAN BEFORE GO TO QUESTION 12

2 WORSE THAN BEFORE

3 ABOUT THE SAME GO TO QUESTION 12

4 DON'T KNOW GO TO QUESTION 12

10) **In what way are conditions worse?** _____

11) **About how long do you think it will be until conditions are about the same as they were before the spill?**

1 _____ (*Circle one:* weeks/months/years)

2 DON'T KNOW

12) **What town or city are you from?**

Town/City: _____

State/Province: _____

Country: _____

Zip/Post Code: _____

Thank you!

FIELD DESCRIPTIONS AND INSTRUCTIONS

NAME: Name of field staff collecting data

SITE NUMBER AND NAME: Site number and name from site-specific protocol

DATE: Date of data collection

STATE: State where site is located

NONRESPONSE: Reason interview was not completed. A respondent who departs before being interviewed "left too quickly". "Party already interviewed today" applies when attempting an interview with a boating party that was already interviewed during a previous departure from the site today.

GENDER: Observed gender of respondent.

INTERVIEW TIME: Time of interview

TRANSIENT BOAT: Indicates whether or not boat was transient. A transient boat is a boat that arrives by water prior to departing by water. For example, a boat may enter a marina from the water to refuel at a dock/landing area.[1]

INTERVIEW LOCATION: Location where interview was conducted (see area descriptions in data collection procedures)

TYPE OF BOAT: Type of boat (see Boat Departure Count Sheet for type descriptions)

Read each question exactly as it appears on the interview form and record the responses.

[1] A note to the reader: for many interval count and interview studies, an interview question such as, "Are you leaving for the day" is used to identify unique departures. In cases where the respondent says "No", the interview is terminated. If the respondent says "Yes", the interview proceeds. This approach could be used on this datasheet rather than observing if the boat is "transient".

Appendix E. Example Safety Plan

HEALTH AND SAFETY PLAN

Project title: [Insert title]

Project Location: [Insert location(s)]

Date of activities: [Insert dates]

1. SITE PERSONNEL AND RESPONSIBILITIES

All personnel working in the field will be responsible for familiarizing themselves with and following all procedures and guidelines described in this Health and Safety Plan.

Field supervisors will act as the site safety coordinators (SSCs). The SSCs will ensure all team members adhere to the safety plans.

Field staff must assess each site for safety before conducting work each day at any location. Specifically, assess each site for potential hazards that are presented in Section 3. If potential hazards are present other than those presented in Section 3, contact a field supervisor prior to conducting any work at a site. Safety is the most important job that each person has in the field, and all field personnel are expected to maintain a strong commitment to safety. If a field staff member feels that an unsafe environment exists, it is his or her responsibility to first remove him or herself from the dangerous situation and to then immediately contact a field supervisor.

1.1 Medical Emergency

In case of an emergency (ambulance/police/fire), dial 911.

Prior to going to any site, know the location of the nearest hospital or clinic to that site. If needed, contact your field supervisor to help locate the nearest hospital or clinic.

1.2 Drug and Alcohol-Free Workplace

This project has a zero-tolerance drug and alcohol policy. No worker may use, possess, distribute, sell, or be under the influence of alcohol or illegal drugs while performing work for this project This includes time spent driving to and from your home to a worksite, and driving in between sites. The legal use of prescribed drugs is permitted on the job only if it does not impair an employee's ability to perform the essential functions of the job effectively and in a safe manner that does not endanger other individuals in the workplace. All workers are expected to refrain from drinking alcohol at least eight hours prior to the beginning of any shift. Do not drink alcohol on the job or within any timeframe prior to the start of your shift that would interfere with your ability to perform all tasks safely and effectively.

1.3 General Themes

Be safe. Teams will be operating with considerable independence and need to be careful in executing their tasks. Employ and actively use the buddy system to ensure the health and well-being of team members at all times.

2. SAFETY TRAINING REQUIREMENTS

Prior to beginning work in the field, all field personnel are required to fulfill the following requirements:

- Read and understand the Health and Safety Plan (this document). All personnel will be required to confirm in writing they have read and understand this plan and submit a signed form to a project manager.
- Complete the online defensive driving course and submit a certificate of completion to a project manager. A project manager will provide directions to field staff regarding this requirement. You will be notified on an annual basis (if applicable) to repeat this course and provide a new certificate of completion.
- Provide a project manager with a valid certificate for standard adult first aid with cardiopulmonary resuscitation (CPR)/automated external defibrillator (AED). We recommend obtaining this certificate from the American Red Cross, but will consider certifications from other organizations. To find a course through the American Red Cross in your area, visit the following website: http://app.redcross.org/en/takeaclass. Search for a course in the "First Aid, CPR, AED, for Lay Responders" category. You will need to complete the course called "Adult First Aid/CPR/AED."
- While most field work that has occurred related to this oil spill has required HAZWOPER training and certification, this requirement is not applicable for this sampling effort because exposure to hazardous substances is not anticipated as part of the intended scope of work.

All field personnel are required to keep a copy of the certifications and signed confirmations they have completed from the list above.

2.1 Nightly Call

Each night there is a mandatory conference call with field supervisors and all team members in the field. The nightly conference call ensures that all field staff members who worked in the field that day have safely returned from their worksites. In addition, the nightly calls are used to inform field staff of any potential safety concerns in the field, any safety issues which arose that day, and how to appropriately prepare to mitigate such safety issues in the future. General safety updates are repeated three consecutive nights on the nightly calls to ensure that all field staff receive any necessary updates.

2.2 Clothing Requirements

All personnel working in the field are required to wear the following clothing items:

[Insert required clothing items; see Chapter 5 of this manual for guidance]

- [Clothing]
  - [Description]

2.3 Personal Protective Equipment (PPE) Requirements

The following pieces of PPE are required for safety reasons:

[Insert required PPE; see Chapter 5 of this manual for guidance]

- [PPE]
  - [Description]

3. POTENTIAL HAZARDS AND MITIGATING ACTIONS

3.1 Encounters with Aggressive or Violent People

Most onsite data collection efforts will require personnel to have extensive contact with the public, particularly if interviews are conducted. Thus, it is possible that an encounter with an aggressive or violent person may occur.

Mitigating action: Field staff can use the "buddy system" and check in regularly with field supervisors. Staff can be encouraged to stay away from individuals or groups of people that seem uncooperative or threatening. If conducting an interview with or near an aggressive or violent individual, the interview can be terminated immediately. Call 911 if the situation gets out of control and personnel safety is at risk.

3.2 Exposure to Oil-Contaminated Water, Soil, or Air

When data are collected in coastal locations in the aftermath of a spill, it is possible that field personnel may encounter oil-contaminated resources.

Mitigating action: Field staff can be encouraged to avoid contact with weathered oil and oil-contaminated materials. If staff come into contact with such materials, the affected area can be cleaned using baby oil or another similar product, seeking medical attention as needed.

In an environment where staff may be exposed to a chemical or biological substance in the air beyond permissible limits defined by the Office of Safety and Health Administration (OSHA), initial and continuous air monitoring will be conducted. Further, staff may be required to wear respirators or other personal protection equipment. See the OSHA Toxic and Hazardous Substances air contaminants standard for further information.[16]

3.3 Contact with Wildlife and Insects

Wildlife and insects are part of the coastal environment where onsite data collection occurs. Thus, it is likely that field personnel will encounter wildlife and insects while collecting data. Stinging and biting insects such as ants, wasps, bees, mosquitoes, and spiders can cause irritation and possible allergic reactions.

[16] https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9991

Mitigating action: Field staff can be instructed to avoid wildlife and insects by maintaining awareness of their surrounding environment and staying on designated paths. Field staff may be required to wear closed-toe shoes and encouraged to use insect repellant. If insect repellent is not worn, high coverage clothing such as long pants, socks, and long-sleeved shirts may be required.

If bitten, stung, or scratched by wildlife or insects, field staff should seek medical attention as needed (e.g., use of over-the-counter products that relieve pain, reduce swelling, and prevent infection). Field staff with known allergies should follow recommendations from their doctor (which may include, but are not limited to, carrying an epi-pen or other form of epinephrine that would be required in an emergency), and field staff should consider informing their field supervisor of any such known allergy or medical condition.

3.4 Physical Fatigue

Data collection may require long work days and include shifts that begin early in the morning and end late in the evening.

Mitigating action: Field staff can be encouraged to get plenty of sleep each night before working in the field, drink plenty of fluids during working hours to avoid dehydration, carry and eat small snacks, and avoid large meals. Staff can be told to self-monitor energy levels and communicate with data collection partners to avoid overexposure.

Study managers can schedule staff to work as close to their homes as possible, consider weekly maximum hours that staff may not exceed, minimize consecutive working days, and require minimum gaps between shifts (e.g., 8 hours) when staff work on consecutive days. In cases when staff need to drive long distances to and from sites and/or work long days, field staff may need to stay overnight at a hotel near a site the night before and/or after a data collection shift.

3.5 Heat Stress/Sun Exposure

Data collection at coastal sites will likely require personnel to work outdoors in the sun and heat. Unmitigated exposure to heat and sun can result in heat stroke, heat exhaustion, heat cramps, sunburn, and heat rashes.

Mitigating action: Study managers may require field staff to have fluids for hydration with them at all times. A cooler with water and ice can be stored in the trunk of a car. A water bottle strap or other type of fluid-carrying device can be used if field staff are required to walk sites for data collection. If field staff feel overheated, they may seek a cool place and rest until they feel prepared to work again. Teammates should monitor each other for heat-related symptoms.

Study managers may require field staff to wear a brimmed hat when working in non-shaded areas during daylight hours, and to wear breathable clothes to protect the body from sun exposure. Sunscreen should be applied 15 minutes prior to exposure and at least once every two hours. The use of sunglasses may also be recommended.

Exhibit 1 highlights heat-related illnesses and the accompanying symptoms, as well as the remedial approaches to consider for each illness. As stated above, field staff may rely on the buddy system to evaluate each other for any heat-related illnesses.

Exhibit 1. Symptoms and First Aid Measures for Heat-Related Illnesses

ILLNESS	SYMPTOMS	FIRST AID OPTIONS TO CONSIDER
Heat stroke	• Confusion • Fainting • Seizures • Excessive sweating or red, hot, dry skin • Very high body temperature (105°F or higher) • Chills and shivering • Loss of consciousness	• Call 911 • Place worker in a shady, cool area • Loosen clothing, remove outer clothing • Fan air on worker; cold packs in armpits • Wet worker with cool water; apply ice packs, cool compresses, or ice if available • Provide fluids (preferably water) as soon as possible • Stay with worker until help arrives
Heat exhaustion	• Cool, moist skin • Heavy sweating • Headache • Nausea or vomiting • Dizziness • Light headedness • Weakness • Thirst • Irritability • Fast heart beat	• Sit or lie down in a cool, shady area • Drink plenty of water or other cool beverages • Cool body with cold compresses/ice packs • Go to clinic or emergency room for medical evaluation or treatment if signs or symptoms worsen or do not improve within 60 minutes • Do not return to work that day
Heat cramps	• Muscle spasms • Pain • Usually in abdomen, arms, or legs	• Rest in shady, cool area • Drink water or other cool beverages • Wait a few hours before returning to work • Seek medical attention if cramps persist
Heat rash	• Clusters of red bumps on skin • Often appears on neck, upper chest, folds of skin	• Keep the affected area dry
Source: OSHA. Occupational Heat Exposure. http://www.osha.gov/SLTC/heatstress/heat_illnesses.html.		

3.6 Cold Stress

Data collection may entail exposure to cold temperatures, particularly in the early morning and late evening. Unmitigated exposure to cold air can result in chills, frost bite, or hypothermia.

Mitigating action: Study managers may direct field staff to wear appropriate clothing for the weather, which may include hats, gloves, and coats in cold weather. Heat packs and hot beverages may also be helpful. Staff can be encouraged to take breaks in heated areas (e.g., a car) as needed to avoid becoming chilled or developing numbness in extremities.

3.7 Slip, Trip, and Fall Hazards

Data collection often requires field staff to spend extensive time on their feet. Field staff may be required to walk on uneven or slippery surfaces for extended periods of time.

Mitigating action: Study managers can encourage field staff to survey a site for slip, trip, and fall hazards upon arrival. Staff can reduce potential hazards by keeping walkways/paths of travel clear of obstructions and wearing appropriate shoes for trail or path conditions.

3.8 Automobile Traffic at Sites

Data collection may require field staff to work in close proximity to traffic (e.g., adjacent to highways or in/near access point parking areas).

Mitigating action: Field staff can be instructed to stay clear of any active roadways and parking lot entrances/exits, if possible. The use of highly visible reflective traffic safety vests may be required when avoiding traffic is infeasible.

3.9 Driving to and from Sites

Data collection will likely require field staff to drive to and from worksites, exposing these personnel to some risk of an accident.

Mitigating action: Study managers may prohibit the use of cell phones while driving (i.e., no texting, talking, or emailing).[17] Staff can be instructed to pull over to a safe place if they need to use a cell phone. Study managers may also emphasize "the rules of the road", including following posted signs, avoiding excessive speed, and being attentive to their surroundings. Staff can also be encouraged to avoid eating, drinking, or adjusting non-essential vehicle controls while driving; to plan routes before beginning a trip; and to maintain working lights, proper fluid levels, and appropriate tire tread and pressure.

3.10 Inadequate Lighting

Data collection may require field staff to collect data in places and/or during times with inadequate lighting. Inadequate lighting may increase the risk of slip, trip, and fall-related injuries.

Mitigating action: Field staff members can be required to use a headlamp when working in places and/or during times with inadequate lighting.

3.11 Severe Weather

Field staff may encounter sever weather while at a site or when traveling to and from sites, which may pose a serious safety risk.

Mitigating action: Field supervisors can monitor threats from severe weather and coordinate with field staff on the ground to ensure safety. Study managers should consider canceling/suspending data collection when sites or travel routes are included in an area with a severe weather advisory, including a tropical storm warning, flood warning, thunderstorm warning, and tornado warning. We suggest that rules about hazardous weather be established at the outset of the project. This helps avoid the need to make snap decisions as hazardous weather conditions arise. In the event that field staff encounter severe weather, they can be instructed to seek shelter immediately in the closest appropriate location, such as a car or building.

[17] In many states, the use of cell phones while driving is already prohibited by law.

4. RESPONDING TO AN INCIDENT

This section provides procedures for responding to several types of incidents that could potentially occur while working on this project. The types of incidents covered in detail are encounters with aggressive or violent people, contact with wildlife and/or insects, physical fatigue, heat stress/sun exposure, and vehicle accidents. For **all** incidents, the following general procedures apply:

In the event a co-worker is injured or encounters some other form of medical emergency, all field personnel are expected to:

Immediately call 911 or contact emergency medical services by some other means.

Take the necessary steps to protect the co-worker from imminent further harm, to the extent that this can be done without placing him or her at risk.

Notify a field supervisor or a project manager of the situation, as soon as this can be done without interfering with efforts to administer first aid or otherwise attend to the co-worker's immediate well-being.

Field personnel are not required to administer first aid as part of their job duties. However, particularly because work in the field is often far removed from emergency medical services, we encourage our field personnel to do what they safely can to assist one another and we require field personnel to complete CPR training. In deciding whether and what first aid to administer, please consider any training you have received (as well as the limits of that training) and use your best judgment, with concern for your own safety as well as that of your co-worker.

When responding to an incident, the SSC is responsible for filing an incident report, provided in Appendix C. The purpose of this reporting is to identify potential job hazards and address the work practices to prevent future incidents. Field staff members involved in an incident are responsible for providing details about the incident to support the SSC's report, including the date, time, location, circumstances that led to the incident, a description of the incident, whether or not the field staff sought medical treatment, and whether or not property damage occurred.

4.1 Encounters with Aggressive or Violent People

In addition to the general procedures listed at the beginning of Section 4:

- Terminate the interview immediately and remove yourself from the threatening situation as quickly as possible.
- Locate your field staff partner(s) and notify/warn them of the situation.
- Only continue work if the threatening person(s) has left the area.
- If injury or property damage has occurred, report the incident to the police immediately. If human injury exceeds minor scrapes, scratches, and bruises, seek medical treatment immediately.

4.2 Contact with Wildlife and/or Insects

In addition to the general procedures listed at the beginning of Section 4:

- If you have an allergic reaction to insect bites, or are bitten or attacked by wildlife, seek medical treatment immediately. If bitten or attacked by wildlife, report the incident to the police or local wildlife department immediately. If insect bites are minor, treat with appropriate ointments or other over-the-counter treatments.
- If necessary, consult a physician.

4.3 Physical Fatigue

In addition to the general procedures listed at the beginning of Section 4:

- Cease work and seek a safe place to immediately sit or lie down
- Drink water and eat something nourishing
- If necessary, consult a physician
- Return to work only if your strength returns.

4.4 Heat Stress/Sun Exposure

In addition to the general procedures listed at the beginning of Section 4:

- Remove yourself and/or partner from the sun and heat immediately. Seek shade or an air-conditioned space.
- If your symptoms are indicative of heat stroke, call 911 immediately. If symptoms are indicative of second degree (or worse) sun burns, seek medical treatment immediately. For minor sunburns, cover your skin before returning to work and treat with over-the-counter products.
- If necessary, consult a physician.

4.5 Vehicle Accidents

In addition to the general procedures listed at the beginning of Section 4:

- Assess the damage to both people and property
    - If human injury exceeds minor scrapes, scratches, and bruises (including non-visible wounds), seek medical treatment immediately. For non-visible wounds (e.g., head injury), remember that being in an accident can result in high levels of adrenaline, so keep this in mind when assessing your health.
    - If property damage is assessed to exceed the State's reporting limit (ask your supervisor for this information), report the incident to the police immediately.
    - Follow the instructions of your insurance company for reporting the accident and contacting law enforcement (usually written on the back of your insurance card).

A. VEHICLE SAFETY

We are committed to safe driving practices, which reduce traffic-related accidents and injuries.

This appendix provides guidance for traffic and vehicle safety policies to reduce traffic-related accidents and injuries. This sampling effort requires long drives, and maintaining driver safety is one of the most important parts of your job.

The remainder of this appendix is organized as follows:

- Section A.1 presents types of potential vehicle incidents
- Section A.2 discusses motor vehicle record checks
- Section A.3 discusses regulatory compliance
- Section A.4 discusses distracted driving
- Section A.5 discusses road rage
- Section A.6 discusses a drug- and alcohol-free workplace
- Section A.7 outlines vehicle maintenance
- Section A.8 describes vehicle incident reporting
- Section A.9 discusses disciplinary action.

A.1 Types of Potential Vehicle Incidents

An incident involving a vehicle can happen at any time. A vehicle incident includes vehicle accidents and traffic citations. No driver can control weather conditions or other driver's mistakes. Some vehicle breakdowns may also be beyond your control. However, you can prepare for emergencies by asking yourself specific questions that might relate to the types of incidents that you might encounter. For example:

- What is the weather forecast?
- Will the route require driving on dangerous or heavily travelled roads?
- What will traffic be like?

Examples of factors that may increase the potential for a vehicle incident, particularly an accident, include:

- Driving in the dark – Driving to early morning shifts and driving home after late shifts may require you to drive in the dark. You are at a greater risk when you drive in the dark. In the winter, it gets light later in the morning and gets dark earlier in the evening. Drivers should take extra time and care when driving in the dark. Make sure your headlights are working and clean so that you can see clearly in front of you. Also, make sure your brake lights and turn signals are working and clean so that other drivers can easily see your vehicle. In addition, make sure your windows and mirrors are clean and properly positioned.
- Driving while fatigued – Fatigue can be caused by working during hot and humid temperatures, working long hours, not eating enough, not staying properly hydrated, or for a multitude of other reasons. If you are feeling fatigued, do not drive. Pull off

the road to a safe location and properly rest, eat, and/or hydrate. Do not begin driving again until you feel you are no longer fatigued.

- Slippery road surfaces – It takes longer to stop and it is more difficult to turn without skidding when the road is slippery. In order to be able to stop in the same distance as a dry road, you must drive slower. Wet roads can double stopping distances. To reduce risk when driving on a wet road, reduce your speed by one-third (e.g., reduce your speed from 55 mph to approximately 35 mph), and double your following distance. In general, on a dry road, a two- to three-second gap is a safe following distance. On a wet road, a minimum four-second gap is needed.
- Roads right after it begins raining – Pay special attention right after it starts raining because the rainwater mixes with the oil left on the road by vehicles and makes the road very slippery.
- Hydroplaning – When water collects on the road, your vehicle becomes susceptible to hydroplaning. Hydroplaning is when your tires lose contact with the road and have little or no traction. You may not be able to brake or steer your vehicle. If your vehicle is hydroplaning, do not use your brakes to slow down. You can regain control by letting up on the accelerator and allowing your vehicle to slow down when your wheels can turn freely. It does not take a lot of water to cause a car to hydroplane and hydroplaning can occur at speeds as low as 30 mph. To help prevent hydroplaning, keep your tire pressure at the proper level and do not let the tread on your tires get worn to an unsafe level.
- Driving through water – The areas in which you are working and traveling are subject to heavy rainfall which can cause flooding. Never drive a vehicle on a road surface that is covered with water due to a flood. In case of flash flood warnings, drivers should avoid known flood areas. Know alternate routes to get around these problem areas. Do not attempt to cross roads or bridges that are flooded.
    - If, however, you find yourself in a situation where your vehicle is in deep puddles or flowing water, and you feel that it is too dangerous to continue, keep the engine running at a fast idle by holding the accelerator pedal down as you brake. Do not exit the vehicle in fast-flowing or deep water. Once stopped, shift into reverse, checking to make sure it is clear behind you. Keep the engine running slightly faster than normal as you back out.
    - Whether you back out or drive through the water, drive slowly afterward and continue applying your brakes lightly for a few minutes to heat them up and dry them out. Test frequently to see if brakes are dry enough for you to stop quickly. Always check traffic behind you to make sure it is safe to test your brakes.
- Driving in very hot weather – Make sure you pay special attention to your tires, engine oil, engine coolant, engine belt, and hoses in your car, which can all be affected by very hot weather. In addition, tar in the road pavement can rise to the surface in very hot weather. Spots where the tar has risen to the surface may be very slippery.

A.2 Motor Vehicle Record (MVR) Checks

All field personnel must pass a pre-employment MVR check in order to work on this project. Additional MVR checks will be conducted annually or after an incident, if necessary.

Any of the following would result in a "Does Not Meet Driving" designation:

- A driver's license that is currently revoked, suspended, or is not valid or current.
- Two or more violations for driving without insurance during the past 3 years.
- Two or more license suspensions/revocations during the past 3 years.
- Three or more moving violations during the past 3 years.
- Pattern violations or a combination of the above may result in a "Does Not Meet Driving" designation.
- Two or more accidents during the past 3 years. (If we are unable to determine from the MVR check the negligent party, it will be the responsibility of the applicant/employee to obtain information to prove they were not negligent.)

Or any one of the following convictions within the past 5 years:

- Alcohol-related (e.g., DWI, DUI, OWI, etc.)
- Hit and run
- Vehicular homicide, vehicular manslaughter, vehicular assault, etc.
- Use of a vehicle in the commission of a felony
- Eluding law enforcement and/or police.

A.3 Regulatory Compliance

- Drivers are required to comply with all federal and state highway safety regulations. These include, but are not limited to, regulations issued by the:
  - Federal Motor Carrier Safety Administration (FMCSA)
  - U.S. Department of Transportation (USDOT)
  - National Highway Transportation Safety Administration (NHTSA)
  - Federal Highway Administration (FHWA)
  - Employment Standards Administration (ESA)
  - Louisiana Department of Transportation (LDOT)
  - Mississippi Department of Transportation (MDOT)
  - Alabama Department of Transportation (ALDOT)
  - Florida Department of Transportation (FDOT).
- Traffic laws – All drivers are required to obey all federal and state traffic laws while on the job. Drivers should not exceed posted speed limits and should obey all traffic lights and road signs. Drivers should not follow other vehicles too closely (i.e., no tailgating), and should yield right-of-way when appropriate. Drivers should always employ defensive driving tactics at all times on the job.

- Seat belts – Most states require drivers and front seat passengers to use a seat belt. The use of seat belts by drivers and all passengers is mandatory whenever on the job, which includes your commute from your home to the work site and from the work site to home, and in between sites.
- Driver's license – Drivers shall hold a valid and current U.S. driver's license.
- Vehicle insurance – Drivers are required to carry valid vehicle insurance.

A.4 Distracted Driving

Distracted driving is any activity that could divert a person's attention away from the primary task of driving. All distractions endanger driver, passenger, and bystander safety. These types of distractions include:

- Cellular/mobile phones – Cellular/mobile phones may not be used while operating a vehicle during work hours. This includes any time that you are driving either to or from your work site, and any time you are driving in between sites. Cell phones may be on but calls may not be answered or initiated while the vehicle is in motion. Allow voice mail to handle any incoming calls and only return those calls when you have pulled off the road to a safe location. If you need to place or receive a call, you must first pull off the road to a safe location.
- Texting – Drivers may not read or send text messages while operating a vehicle. If you need to read or send a text message, you may do so only after you have pulled off the road to a safe location.
- Reading – Reading can include anything from books, magazines, and newspapers to smart phones and travel maps. If you are unsure as to where you are going and need to consult a map, please do so only after you have pulled off the road to a safe location.
- Global positioning system (GPS) – Drivers may not alter a GPS while operating a vehicle. If you need to alter your GPS, you may do so only after you have pulled off the road to a safe location.
- Eating and drinking.
- Grooming.
- Watching a video or adjusting a radio, MP3 device, or CD player.

A.5 Road Rage

Road rage is a motorist's uncontrolled anger that is usually provoked by another motorist's irritating act and is expressed in aggressive or violent behavior. In order to avoid road rage:

- Avoid cutting off other drivers in traffic.
- Do not tailgate. Allow at least a two-second space between your vehicle and the vehicle ahead of you.
- Use your turn signal several hundred feet before you change lanes or make a turn.
- Avoid making hand gestures or eye contact with another driver.
- Be courteous in the use of high-beam headlights.

- Do not flash your lights or blow your horn as a signal of your desire to pass another vehicle.
- Forget winning and allow yourself ample time for your trip.
- Obey speed limits.
- Drive in the right or middle lane; pass on the left.
- Stop at stop signs and red lights; don't run yellow lights.
- Do not block intersections.
- Respect pedestrian right-of-way in crosswalks.
- Put yourself in the other driver's shoes. Do not take other driver's actions personally.
- If someone follows you after an on-the-road encounter, drive to a public place or to the nearest police station.
- Report any aggressive driving incidents to the police immediately.

A.6 Drug- and Alcohol-Free Workplace

This project has a zero-tolerance drug and alcohol policy. No worker may use, possess, distribute, sell, or be under the influence of alcohol or illegal drugs while performing work for this project. This includes time spent driving to and from your home to a worksite, and driving in between sites. The legal use of prescribed drugs is permitted on the job only if it does not impair an employee's ability to perform the essential functions of the job effectively and in a safe manner that does not endanger other individuals in the workplace. All workers are expected to refrain from drinking alcohol at least eight hours prior to the beginning of any shift so as not to interfere with your ability to perform all tasks safely and effectively.

A.7 Vehicle Maintenance

Maintaining your vehicle in good working order is not only vital to completing your job, it is critical to your safety. Maintenance requirements of vehicles fall into four categories:

- Daily servicing needs – On a daily basis you should check fuel and oil levels, tire pressure, and other fluids (e.g., windshield wiper fluid). In addition, any burned out or broken lights (headlights, tail lights, etc.) should be replaced immediately.
- Periodic inspection needs – Periodic inspections should be made in order to detect and repair damage or wear before major repairs are necessary. Periodic inspection items include checking engine coolant, transmission fluid, brake fluid, radiator coolant, suspension elements, leaks, belts, electrical connections, tire wear, and any other noticeable problems.
- Interval-related maintenance – Interval-related maintenance is required to identify wear, alignment, or deterioration problems of parts or fluids. Replacing lubricating oils and filters are examples of interval-related maintenance.
- Breakdown maintenance – Breakdown maintenance is usually unscheduled and requires a service call for repair. Providing your vehicle with daily servicing needs, periodic inspection needs, and interval-related maintenance, better ensures that breakdown maintenance will not be required.

A.8 Vehicle Incident Reporting

All field personnel involved in a vehicle incident (including traffic citations and accidents) are required to report the incident to his or her field supervisor as soon as possible after the vehicle incident occurs. In the event you are involved in a vehicle accident, it is mandatory that you coordinate with your field supervisor so that he/she is able to fill out an incident report, once you are safely away from the hazard and well enough to do so. Field staff should notify their field supervisor of any motor vehicle violations or convictions (regardless of whether or not they occur while on duty) within 24 hours of the incident. Please see Section 4.5 of this health and safety plan for further instructions on how to report a vehicle accident.

A.9 Disciplinary Action

All drivers are obligated to follow the necessary precautions to avoid preventable incidents while operating a vehicle on the job. A preventable incident is one in which the driver failed to do everything that reasonably could have been done to avoid the incident. When a driver commits an error(s) and/or fails to react reasonably to the error(s) of others, an incident is preventable. When a driver commits no errors and reacts reasonably to the error(s) of others, the incident is not preventable. In the case of an accident, a police report is needed to determine if the incident was “preventable” and to evaluate whether a drug/alcohol test is needed.

Violations of any of the following may result in disciplinary action up to and including termination:

- Showing up for any shift under the influence of any intoxicating substance and/or the use of an intoxicating substance while on duty
- Failure to immediately report any accident to your field supervisor
- Being involved in preventable vehicle incidents (see Section A.2)
- Possession of an open alcoholic beverage while driving or illegal drug
- Possession of any weapon or firearm while on the job
- Conviction for driving under the influence/driving while intoxicated (DUI/DWI).

B. HURRICANE AND EMERGENCY EVACUATION PREPAREDNESS GUIDELINES

This appendix is intended for field staff who reside along the Gulf Coast and in inland areas, and whose work requires them to be in the field during the day. Field staff, like all residents, should monitor weather situations closely during the hurricane season and should be informed about and ready for hurricanes as they approach in accordance with federal and state hurricane preparedness guides. Field staff should always know and follow local evacuation plans and orders. The following project hurricane and emergency evacuation preparedness guidelines should supplement federal and state hurricane preparedness guides and evacuation route information.

B.1 Hurricane Season

Atlantic hurricane season runs from June 1 to November 30 each year. Risks associated with hurricanes include those from storm surge, flooding, wind, and tornadoes. Because work for this project occurs in coastal areas that are susceptible to hurricanes, it is important that every person working in the field has the information he or she needs and is prepared in case a storm approaches. It is the policy of project managers to maintain safe working conditions for all employees at all times. If a tropical storm or hurricane warning is issued for any sampling area, a cancelation notice will be given no later than 2:00 pm the day before the storm is expected to make landfall. Notices will be issued by field supervisors, project managers, and/or NRDA Field Ops. All field staff should adhere to local evacuation orders in the event of a hurricane.

B.2 Hurricane Season Project Safety Guidelines

- Be prepared
  - Preparation and information are considered the two most important tools for residents in hurricane-prone areas. The links below in Sections B.3 and B.4 provide information about stocking disaster supply kits, creating family disaster plans, securing your home, knowing your vulnerability, and identifying local evacuation routes.
- Cell phones and other communication
  - You are required to have your cell phone turned on at all times while you are driving to and from sites and while you are working during a shift or loop. Calls from field supervisors and project managers should be answered whenever possible. If you are unable to answer your phone (e.g., because you are driving), return all project-related calls as soon as you can. If you are in an area where mobile phone service is not available, it is acceptable to send texts to obtain or relay safety information.
  - Have an alternate communication plan in case you are in an area with no mobile phone service. Emergency alert and warning information, as well as evacuation bulletins, will be broadcast on local radio and television stations. The Federal Emergency Management Agency (FEMA), the American Red Cross, and NOAA all have both Facebook and YouTube sites that will be updated with hurricane-related information. In addition, fema.gov is a mobile-ready website that is designed for fast download in case of an emergency.

- Evacuation routes
  - Know the evacuation route from any site at which you are working. If you are scheduled to work in an area with which you are unfamiliar or where you are unaware of the evacuation route, prior to driving to your site, visit the state, county, local, or other applicable website to obtain information that would enable you to evacuate safely.
  - Please print emergency evacuation guides and keep them with you or in your vehicle whenever you are working. A list of local sites and guides can be found in Section B.3 below.
- Gasoline
  - Gas tanks should always be at least half-filled with gas while performing tasks associated with the project during hurricane season.
- Water
  - Have enough water not only to hydrate you during a shift, but also to last as you evacuate if you are required to do so. (At least 3 gallons of water per person per day is recommended.)

B.3 Evacuation Routes and Guides (by region)

- Louisiana
  - Southeast (New Orleans, Slidell): http://gohsep.la.gov/evacinfo/SEHurriGuide.pdf
  - Southwest (Lake Charles, Lafayette): http://gohsep.la.gov/evacinfo/SWHurriGuide.pdf
- Mississippi
  - http://www.gomdot.com/Home/EmergencyPreparedness/pdf/HurricaneEvacuationGuide.pdf
- Alabama
  - http://aldotapps.dot.state.al.us/Hurricane%20Call%20Center/frm/HurricaneBrochure2010.pdf (this is the most recent version available on ALDOT's website)
  - http://aldotapps.dot.state.al.us/Hurricane%20Call%20Center/emergency_information.htm (for the most up-to-date information)
- Florida
  - http://www.floridadisaster.org/publicmapping/index.htm (organized by county).

B.4 Other Useful Information

The following links have information related to evacuation plans, family disaster plans, and hurricane preparedness:

- FEMA/Citizen Corp/Ready.gov: www.ready.gov/hurricanes

- FEMA Hurricane site: http://www.fema.gov/hazard/hurricane/index.shtm
- National Hurricane Center/NOAA:
  http://www.nhc.noaa.gov/HAW2/english/basics.shtml
- YOUR EVACUATION PLAN (State of Louisiana):
  http://gohsep.la.gov/yourevacuationplan.aspx
  (this site provides useful information about how to evacuate and may be helpful for those living outside of the state as well)
- Mississippi Emergency Management Agency: http://www.msema.org/
- Alabama Emergency Management Agency: http://ema.alabama.gov/
- Florida Division of Emergency Management: http://www.floridadisaster.org.

C. INCIDENT REPORTING FORM

[redacted]

Preliminary HSSE Incident Report
"Short Form"

[redacted]

Section 1: Worker Information (when applies)							
Name		*DOB*		*Position*		*Phone #*	
Employer		*Sex*		*Last 4 SS#*			
Supervisor		*Supervisor Employer*		*Phone #*			

Section 2: General Incident Details			
Location of Incident			
State		*Address/ Area being worked:*	
City			
Date and Time of Incident			
Date		*Time*	*Other Info*
Describe the circumstances that led to the incident:			
Description of the Incident (What Happenened): (use reverse side if additional space is required)			
Were there any witnesses to the incident? If "yes" please list their name and company.			

Section 3: Injury/Illness Details (If this incident caused an injury or illness, complete this section)	
Describe the injury and body part affected (e.g., 1 inch scratch to right forearm) affected	
Describe the treatment received: (e.g., antiseptic and band aid applied)	

Section 4: Material Release (If this incident resulted in a material release, complete this section)			
Type of Material Released		Volume of Material Released	
Released to: i.e.(water, land, containment)		Volume of Material Recovered	
Was material cleaned up?			

Section 5: Disposition (check box)			
	Treated in the field and release		Transferred to emergency room/hospital
	Transported to urgent care clinic		
If off site treatment is required, where did they receive treatment?			
Responsible company/contractor Medical Case Manager. (Name & phone number)			

Person providing information		Date	
Person reviewing incident		Date	
Responsible Supervisor		Date	

Note to Reviewer: Set a positive tone for the obtaining of information and conduct questioning from learning approach. Do not overwhelm the person providing the information.

Email completed form to: [redacted]

[Type text]

Appendix F. Example Codebooks

Shoreline Use Count Form Data Entry Guidelines

VARIABLE NAME	DATA ENTRY GUIDELINES
Name	- Type last name of field staff person and pick from look-up list - If abbreviated form of name is written on data form (e.g. "Sue" instead of "Susan"), ok to select from lookup list as long as there is an unambiguous match - If field staff wrote first initial + last name, ok to select from lookup list if unambiguous - If name on data form is not clearly on list, enter "-6 // " followed by the name as it appears on the data form
Site Number and Name	- Type site # to "jump" to that site number+name in the look-up list for quick selection - Check the site name text written on the data form. It should be unambiguous that the site name written and the site name from the lookup list refer to the same site. If there is a mismatch between the Site number and the Site name written on the data form, or if it is unclear, illegible, or not on the lookup list, enter "-6 // " followed by the name and number as it appears on the data form
Date	Enter MM/DD/YYYY
State Where Site Is Located	Use state look-up list to enter 2 letter abbreviation
Time	- Enter time in HHMM format with no ":" - Use leading zeros, if applicable (e.g. "9:25" should be entered as "0925") - Do not covert from military time
AM or PM	Select AM or PM
Water Count	Enter number as written on data form
Beach Count	Enter number as written on data form
Interview Frequency	Select code for number circled: 1=Every 2=every 3rd 3=every 5th 4=every 10th 5=other
Interview Frequency If Other Is Specified	Enter number value written (e.g.: if "every 16th person" is written, enter "16")
Comments	Enter comments written in comments box. Enter the text exactly as it is written.

Shoreline Use Interview Form Data Entry Guidelines

QUESTION #	VARIABLE NAME	CODING	DATA ENTRY GUIDELINES
	Name		- Type last name of field staff person and pick from look-up list - If abbreviated form of name is written on data form (e.g. "Sue" instead of "Susan"), ok to select from lookup list as long as there is an unambiguous match - If field staff wrote first initial + last name, ok to select from lookup list if unambiguous - If name on data form is not clearly on list, enter "-6 // " followed by the name as it appears on the data form
	Site Number and Name		- Type site # to "jump" to that site number+name in the look-up list for quick selection - Check the site name text written on the data form. It should be unambiguous that the site name written and the site name from the lookup list refer to the same site. If there is a mismatch between the Site number and the Site name written on the data form, or if it is unclear, illegible, or not on the lookup list, enter "-6 // " followed by the name and number as it appears on the data form
	Date		Enter MM/DD/YYYY
	State		Use state look-up list to enter 2 letter abbreviation
	Nonresponse	1=Refusal - no questions answered 2=Refusal - 1+ questions answered 3=Ineligible due to age < 16 4=Language barrier 5=Respondent not approachable 6=Other/Unclear reason	- Select code if field staff comment clearly identifiable as option 1-5 - If not clear why interview was not completed, or other reason given, enter "6" for this field
	Nonresponse If Other Is Specified		Enter text as written, using format conventions
	Gender	1=male, 2=female	Select code for number circled
	Interview Time		- Enter time in HHMM format with no ":" - Use leading zeros, if applicable (e.g. "9:25" should be entered as "0925") - Do not covert from military time
	AM or PM		Select AM or PM

QUESTION #	VARIABLE NAME	CODING	DATA ENTRY GUIDELINES
	Interview Location Is Sandy Beach	0=no, 1=yes	If circled, enter 1; if not circled, enter 0
	Interview Location Is Pier	0=no, 1=yes	If circled, enter 1; if not circled, enter 0
	Interview Location Is Pavement Area	0=no, 1=yes	If circled, enter 1; if not circled, enter 0
	Interview Location Is Boardwalk	0=no, 1=yes	If circled, enter 1; if not circled, enter 0
	Interview Location Is Other	0=no, 1=yes	If circled, enter 1; if not circled, enter 0
	Interview Location If Other Is Specified		Enter text as written, using format conventions
	Frequency At Which Interviews Are Conducted	1=Every 2=every 3rd 3=every 5th 4=every 10th 5=other	Select code for number circled
	Interview Frequency If Other Is Specified		Enter number value written (e.g.: if "every 16th person" is written, enter "16")
Q1_1	Sunbathing	1=yes, 0=no	If circled, enter 1; if not circled, enter 0
Q1_2	Swimming	1=yes, 0=no	If circled, enter 1; if not circled, enter 0
Q1_3	Walking	1=yes, 0=no	If circled, enter 1; if not circled, enter 0
Q1_4	Sightseeing	1=yes, 0=no	If circled, enter 1; if not circled, enter 0
Q1_5	Wildlife Viewing	1=yes, 0=no	If circled, enter 1; if not circled, enter 0
Q1_6	Hiking	1=yes, 0=no	If circled, enter 1; if not circled, enter 0
Q1_7	Picnic	1=yes, 0=no	If circled, enter 1; if not circled, enter 0
Q1_8	Canoe	1=yes, 0=no	If circled, enter 1; if not circled, enter 0
Q1_9	Fishing	1=yes, 0=no	If circled, enter 1; if not circled, enter 0
Q1_10	Shell Fishing	1=yes, 0=no	If circled, enter 1; if not circled, enter 0
Q1_11	Crabbing	1=yes, 0=no	If circled, enter 1; if not circled, enter 0
Q1_12	Boating	1=yes, 0=no	If circled, enter 1; if not circled, enter 0
Q1_13	Some Other Activity	1=yes, 0=no	If circled, enter 1; if not circled, enter 0
Q1_13	If Some Other		Enter text as written, using format conventions

QUESTION #	VARIABLE NAME	CODING	DATA ENTRY GUIDELINES
	Activity, Then Description Of Other Activity		
Q2	Time When Respondent Arrived At Site		- Enter time in HHMM format with no ":" - Use leading zeros, if applicable (e.g. "9:25" should be entered as "0925") - Do not covert from military time - Enter -9 if text response rather than a specific time is written
Q2	Am Or Pm		- Select AM or PM - Enter -9 if text response rather than a specific time is written
Q2	Arrive Time Text If No Specific Time Is Written		Enter as written on data form if arrive time not given as a specific time
Q3	Number Of Hours Respondent Expects To Remain At Site		Enter hours value written on data form, if present. Leave blank if text written but no specific # of hours given, and enter text in duration comments field
Q3	Number Of Minutes Respondent Expects To Remain At Site		Enter minutes value written on data form, if present. Leave blank if text written and no specific # of minutes given, and enter text in duration comments field
Q3	Duration Of Time Respondent Expects To Remain At Site If Specific Values Not Written ("Duration Comments")		Enter as written on data form, if present (e.g. "Until it starts raining.") using format conventions
Q4	Will Trip Last More Than One Day? (Multi-Day Trip)	1=yes, 2=no	Select code for number circled
Q4a	How Many Days Will Multi-Day Trip Last In Total Or Low End Of Range		- Enter # of days written on data form - If range of days is written (e.g. "3-5 days"), enter low value of range - If text is present (but neither value nor range numbers are written), leave blank and enter text from data form in multi-day trip duration comment field
Q4a	Multi-Day Trip - High End Of Range If Present		- Enter high value of range of days if response is written as a range - Leave blank if no high end of range written

QUESTION #	VARIABLE NAME	CODING	DATA ENTRY GUIDELINES
Q4a	Multi-Day Trip Duration Comment If Present ("Multi-Day Trip Duration Comment")		- Enter text from data form if present, and if neither value nor range numbers are written - Leave blank only if information was entered as # of days or range of days
Q4b	Is Purpose Of Multi-Day Trip Recreation?	1=yes, 2=no	Select code for number circled
Q5	Aware Of Oil Spill Before Today?	1=aware, 2=unaware	Select code for number circled
Q6	Did Spill Affect Where You Decided To Go Today	1=did affect, 2=did not affect	Select code for number circled
Q6a	Where Would Respondent Have Gone Had Spill Not Occurred		Enter text as written, using format conventions
Q7	Did Spill Affect What Respondent Decided To Do On Trip	1=did affect, 2=did not affect	Select code for number circled
Q7a	How Did Spill Affect What Respondent Decided To Do		Enter text as written, using format conventions
Q8	Condition Of Beach Better, Worse, About The Same As Before	1=better 2=worse 3=same 4=don't know	Select code for number circled
Q9_1	Condition Worse: More Oil Or Tar Balls	1=yes, 0=no	If circled, enter 1; if not circled, enter 0
Q9_2	Condition Worse: Appearance Or Odor	1=yes, 0=no	If circled, enter 1; if not circled, enter 0
Q9_3	Condition Worse: Impact On Fishing Or Wildlife	1=yes, 0=no	If circled, enter 1; if not circled, enter 0

QUESTION #	VARIABLE NAME	CODING	DATA ENTRY GUIDELINES
Q9_4	Condition Worse: Lower Quality Recreation	1=yes, 0=no	If circled, enter 1; if not circled, enter 0
Q9_5	Condition Worse: Human Health Impacts	1=yes, 0=no	If circled, enter 1; if not circled, enter 0
Q9_6	Condition Worse: Other	1=yes, 0=no	If circled, enter 1; if not circled, enter 0
Q9_6	If Condition Worse Is "Other" Than Description Of Other		Enter text as written, using format conventions
Q9_7	Condition Worse: Don't Know	1=yes, 0=no	If circled, enter 1; if not circled, enter 0
Q10	How Long Until The Beach Will Be The Same As Before Spill?		- Enter single number if written on data form - If single number is not written and text is present, enter -9 for this field and enter information as written in Condition Duration Comment field
Q10	Condition Duration Units	1=weeks 2=months 3=years	- If units are circled, select code for number circled
Q10	Condition Duration Comment ("Condition Duration Comment")		- Enter text comment if present on data form (e.g.: "5-10 years" or "decades") - Use format conventions
Q11	Respondent Town		Enter text as written, using format conventions
Q11	Respondent State		- Enter from lookup list - If non-US state is written, enter -6
Q11	Respondent Country		- If "USA" or "U.S." or "United States" is written, enter as US - If foreign country, enter as seen (e.g. "Germany" or "UK")
Q11	Respondent Zip code		If 9-digit ZIP is written, ok to enter as seen

Example Ground Data Collection Disposition Codes

CODE(S)	DESCRIPTION	CODING GUIDELINES
DATA COLLECTION COMPLETE (DCC)		
DCC	Data collection completed according to protocol	No deviation from protocol occurred.
STAFF STATUS CODES: STAFF NOT PRESENT (SNP)		
SNP 1	Cancelled due to (specify weather conditions)	Shift cancellation by study managers due to weather. This code would typically be applied over many sites due to a widespread storm system (e.g., hurricane), although it may be applied to a smaller number of sites given specific local weather conditions (e.g., ice storm/icy roads).
SNP 2	Holiday cancellation (specify holiday)	Shift cancellation by study managers due to a holiday. On holidays where work is optional, staff who opt not to work should receive this code.
SNP 3	- Sampling at site discontinued by study managers - Study managers did not assign staff to sample - Cancelled for Staff Training/Meeting - Scheduling Error: no staff assigned to sample - Sampling cancelled due to staff shortage	Site not designated as closed, but study managers instructed staff not to sample the site. This code would also apply when: - Study managers cancels shift(s) in order to conduct a training session or staff meeting - No staff were scheduled for a sampling event.
SNP 4	Field staff unable to sample – no parking/full parking	No parking spaces were available for field staff, and no indication of parking lot closure. This code would apply If field staff indicated “no parking.”
SNP 5	Field staff illness – (describe)	Field staff or partner indicated field staff’s absence from shift due to illness or medical problem.
SNP 6	Field staff transportation problem – (describe)	Field staff or partner indicated field staff’s absence from site due to car trouble or accident, delayed in traffic, car broken into, or other transportation problems.
SNP 7	Field staff absent – reason not specified	Field staff or partner indicated field staff’s absence from shift but reason not

CODE(S)	DESCRIPTION	CODING GUIDELINES
		specified.
SNP 8	- Field staff absent – personal reasons - Field staff absent – family reasons - Field staff absent – running late - Field staff absent – instructed not to sample alone due to partner absence	Field staff or partner indicated field staff's absence from shift due to reason other than illness or transportation problem. This code would apply if field staff member or partner indicated that they were behind schedule or "running late" and could not reach the site in time to sample.
SNP 9	- Access to site blocked – parking lot closed - Access to site blocked – (describe road or bridge situation which prevents any access to site)	Parking for the site was designated as closed, the road leading to the site was closed or impassible, or the site was otherwise inaccessible due to physical issues.
SNP 10	- Cancelled to comply with driving safety protocols due to (weather condition) - Sampling discontinued from (date) onward due to safety concerns	Shift cancelled by project management to comply with safety protocols.
SITE STATUS CODES: **SITE STATUS PARTIALLY OPEN (SS- PO) CODES ARE APPLIED WHEN SITE IS PARTIALLY OPEN** **SITE STATUS CLOSED (SS-C) CODES ARE APPLIED WHEN SITE IS CLOSED**		
SS-PO 1	Site partially open/accessible due to oil spill	Field staff indicated that the site was partially open/accessible (access permitted only to part of site) due to oil spill, "hot zone," or oil spill response efforts.
SS-PO 2	Site partially open/accessible for other reason	Field staff indicated that the site was partially open/accessible (access permitted only to part of site) and specified a reason other than oil-spill-related (e.g., construction, repairs, private property, no trespassing signs, or access being denied, or other specified reason).
SS-PO 3	Site partially open/accessible – reason not specified	Field staff indicated that the site was partially open/accessible (access permitted only to part of site) but did not specify a reason.
SS-C 1	Site closed due to oil spill response (provide dates)	Field staff indicated that the site was closed to the public due to oil spill or oil spill response efforts,
SS-C 2	Site closed due to non-oil-spill related factors	Field staff indicated that the site was closed to the public and a non-spill-related reason was specified (e.g. construction, sale of property sampling events fall outside of sites hours of operation).

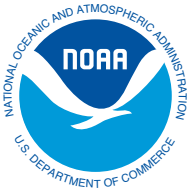
CODE(S)	DESCRIPTION	CODING GUIDELINES
SS-C 3	Site closed – reason indeterminate	Field staff indicated that the site was closed to the public but a reason was not specified. Consider as "Site closed – reason indeterminate" if field staff comments refer to a police barricade or checkpoint that blocks access to the site and a reason for the police checkpoint/barricade is not provided.
SAMPLING STATUS CODES: **COUNTS NOT COMPLETE (CT-NC) CODES ARE APPLIED WHEN COUNT WAS NOT COMPLETED** **INTERVIEWS NOT COMPLETE (INT-NC) CODES ARE APPLIED WHEN INTERVIEWS WERE NOT COMPLETED**		
CT-NC 1, INT-NC 1	Counts/interviews not completed due to weather conditions – (specify)	Field staff determined that they could not sample due to weather conditions. This code applies if field staff began sampling but could not complete sampling due to weather conditions.
CT-NC 2, INT-NC 2	Counts/interviews not completed due to darkness	Field staff determined that they could not sample due to darkness. This code applies if field staff began sampling but could not complete the sampling due to darkness.
CT-NC 3, INT-NC 3	Sampling not completed due to (specify reason)	Field staff determined that they could not sample due to other reasons.
DATA NOT RECEIVED (DNR) CODE IS APPLIED WHEN DATA NOT LOCATED/RECEIVED		
DNR 1	Datasheets not located/received	Data not received code – data cannot be located or were not received.

Appendix G. Example Chain of Custody Form

Example NRDA Chain of Custody Form

Document Description (Intercept Survey, Count Log Book, Photo Log Book)	Document Date or Date Range

Relinquished by:				Received by:			
Date	Time	Signature	Printed Name / Phone	Date	Time	Signature	Printed Name / Phone



The U.S. DEPARTMENT OF COMMERCE
Wilbur L. Ross, Jr., Secretary

National Oceanic and Atmospheric Administration
Benjamin Friedman, Deputy Under Secretary for Operations
Performing the duties of Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator

National Ocean Service
W. Russell Callender, Ph.D., Assistant Administrator for Ocean Services and Coastal Zone Management