

Appendix

III

Methods, Effects, and Mitigation Details

Descriptions of research activities should contain sufficient details about protocols, effects, and mitigation to allow reviewers to evaluate environmental impacts of the project. The following are examples of minimum information that should be provided for the application to be considered complete for the following species:

- *Abalone*
- *Cetaceans*
- *Pinnipeds*
- *Sea Turtles*
- *Sturgeon/Sawfish*

Procedures for Surveys, Sampling, Capture, Etc.

This table describes the type of information to include in the narrative section of an application for commonly permitted activities. If your procedure is not in this table, please contact us if you have questions about what information to include when describing your procedure. The “take table option” column indicates the standardized procedure name to select in the take table portion of your application (see [Appendix III](#)). Brackets in this column indicate there are multiple menu options corresponding to a particular procedure.

There should be a narrative description for each activity in the table, and vice versa. You are encouraged provide **figures or photographs to illustrate** your methods (e.g., tags and instrument attachment devices, nets and net deployment).

In general, you should always indicate

- how long a procedure will take, including average and maximum times
- the number of times a procedure will be performed on an animal or group over a specified time period (e.g., per day, season, year)

Procedure	Take table option	Details to include in narrative
Aerial Survey	Survey, aerial	Type of survey (e.g., line transect) Description of survey area (include latitude and longitude) Season (time of year) Type of survey craft (e.g., fixed wing, helicopter) Altitude and air speed Number of passes per group/animal Duration per group/animal
Active acoustics	Acoustics, active (playback/broadcast)	Signal source (e.g., sidescan sonar, underwater speaker) Source depth in water column Frequency (bandwidth) Maximum source level Maximum received level Distance to target animals Signal duration and duty cycle Duration of exposure Ambient noise level, where known Propagation model, where available
Administer drugs or chemicals	Administer, drug	Name of drug/chemical Dosage Delivery route (e.g., intramuscular, intravenous) Location of administration
Auditory brainstem response or evoked potential	Auditory brainstem response test	Type of measurement equipment Data collection method Data analysis method (include handling/restraint protocols)

Procedure	Take table option	Details to include in narrative
Behavioral observations	Observe, behavioral	Approach method (e.g., from blind or vessel) Closest approach distance Within sight of animals or not? Frequency and duration of observations
Biopsy sampling (restrained animals)	Biopsy, [blubber, muscle, skin]	Type of tissue(s) Location on animal (e.g., dorsal, shoulder, flipper) Size of sample (diameter X depth) Biopsy equipment (e.g., dart, needle/punch, scalpel) Left open or method of wound closure Sample analysis
Biopsy sampling (remote biopsy)	Biopsy, [blubber, muscle, skin]	Type of tissue(s) Location on animal (e.g., dorsal, shoulder, flipper) Size of sample (diameter X depth) Biopsy equipment (e.g., dart) and stopper depth Collection method (e.g., dart fired from rifle) Number of attempts per animal Sample analysis
Blood sampling	Sample, blood	Location of sampling (i.e., which blood vessel) Volume needed for specific assays (including amount needed for replicates and back-ups) Volume to be collected Number of samples per animal Sampling interval (e.g., for serial samples)
Capture	Capture, [various methods]	Type of equipment (e.g., net, trap, pen) and dimensions Deployment method If netting, describe how often net is checked Duration of restraint Describe release protocols
Captive maintenance	Captive, maintain [permanent, temporary]	Duration of captivity Describe facility, including size of enclosure, water supply and drainage, etc.
Chemical restraint	Anesthesia, [various]	Name of anesthetic Dosage Delivery method (e.g., injection, intubation) Duration
	Dart, injectable immobilizing agent	Name of chemical Dosage Delivery method (e.g., CO2 rifle) Duration

Procedure	Take table option	Details to include in narrative
External instrument attachment	Instrument, [external, suction cup, dart/barb tag, etc.]	For restrained animals: Location on body External dimensions Mass in air or water Method of attachment (e.g., epoxy, harness) Duration of instrument retention Duration of attachment procedure Release mechanism or recapture to remove Type of data collection (e.g., archival requiring retrieval)
		For remote attachment: Location on body External dimensions Mass in air Duration of attachment to animal Release mechanism Attachment mechanism (e.g., suction cup) Method of deployment (e.g., fired from crossbow) Type of data collection (e.g., satellite linked) Number of attempts per animal Minimum approach distance and angle
Internal instrument placement	Instrument, internal	Location within body Insertion method (e.g., surgical implant, injection, stomach tube) External dimensions Duration of instrument retention Duration of insertion procedure
Mark (flipper tags, bleach, paint, brand, etc)	Mark, [various types]	Type of mark (e.g., plastic or metal tag, bleach) Location on body Method of application (e.g., branding iron, pliers, paint pellet rifle) and disinfection procedures Duration (e.g., until molt) Dimensions of tag or mark
Photo-identification	Photo-id	Approach method (aerial, ground, vessel) Closest approach distance Approaches per animal (e.g., per day) Duration per animal/group
Physically restrain	Restrain, [various methods]	Describe equipment if other than by hand (e.g., type of net or enclosure) Duration

Procedure	Take table option	Details to include in narrative
Vessel survey	Survey, vessel	Type of survey (e.g., line transect) Description of survey area (include latitude and longitude) Season (time of year) Number of surveys per year Type/size of survey vessel Vessel speed when approaching animals Approach distance, angle, and duration per animal/group, for off-track observations
Import samples	Import/export/ receive, parts	Type of sample (e.g., blood, muscle) Country of origin or high seas How sample/animal is taken in country of origin Type of storage/shipping container, including preservatives, etc. Analytical techniques

Effects of Research

For each type of research procedure, describe the potential side effects and reactions (behavioral and physiological responses), as they would be without best practices, before mitigation, etc. If you will be working with more than one species, sex, or age class, be sure to discuss how these side effects and reactions vary by group.

Examples of types of responses include changes in swim speed and direction, movement of animals from land into the water, increase in stress hormone levels, and abandonment of behaviors or locations. Examples of effects include tissue trauma (e.g., from biopsies and other invasive procedures), temporary threshold shifts, increased risk of predation, failure to reproduce, reduced growth rates, and death.

Discuss the duration of these effects and responses as it relates to recovery to pre-research state. For example, describe the typical time for biopsy samples to heal, how long after a survey before animals return to pre-disturbance behaviors, how long after sedation before animals regain normal locomotor function.

Mitigation and Monitoring Measures

Discuss what measures you will take to avoid or minimize the potential for or adverse impacts of the side effects and reactions you described for each procedure.

For example, describe measures you will take to minimize the numbers of animals displaced or harassed by surveys or what you will do to avoid mortality associated with use of certain sedatives or immobilizing agents. Be sure to discuss how these measures would vary by species, sex, or age class.

Explain how you will monitor animals for signs of adverse reactions and side effects, including what behaviors or other factors you consider indicative. It is important to describe how effective your monitoring will be at detecting adverse effects as part of the discussion of how effective the actions you would take to avoid or minimize them will be.

For example, describe how often nets or in-water traps will be checked as it relates to the potential for drowning or serious injury. Or discuss how pinniped survey sights would be evaluated after a disturbance to determine whether dependent pups had been injured or abandoned. For cetaceans, describe resight protocols and photo-matching of tagged or biopsied animals.

If monitoring or mitigation is not feasible for specific procedures, species, situations, etc., explain why.