

**INSTRUCTIONS FOR SUBMITTING A “LETTER OF INTENT” UNDER THE
GENERAL AUTHORIZATION FOR SCIENTIFIC RESEARCH**

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Overview

Under the Marine Mammal Protection Act (MMPA), the General Authorization (GA) applies to *bona fide*¹ scientific research studies on marine mammals for activities involving only Level B harassment². Research on marine mammals listed as endangered or threatened under the Endangered Species Act (ESA), including research that would otherwise qualify for the GA, requires an ESA/MMPA scientific research permit.

The following types of research activities will likely qualify under the GA:

- photo-identification studies
- behavioral observations
- vessel population surveys
- aerial population surveys (except aerial surveys over pinniped rookeries at altitudes of less than 1,000 ft.)

The terminology associated with the GA is different from that of other research permits. The application is referred to as a Letter of Intent (LOI) and instead of a permit, a Letter of Confirmation (LOC) is issued.

When to Apply

Target species	Non-target species	When to apply
Non-ESA listed marine mammals. Research activities resulting in Level B harassment only	No ESA-listed species or designated critical habitat will be adversely affected by the research activities	At least 4 months prior to when you want to begin research activities

If an application does not contain sufficient information to complete analyses on the environmental impacts of the proposed activity, the application may be returned to the applicant or processing will be prolonged.

Unlike other permit types, LOCs do not require a 30-day public comment period.

¹ **Bona fide scientific research:** Scientific research conducted by qualified personnel, the results of which—

- likely would be accepted for publication in a refereed scientific journal;
- are likely to contribute to the basic knowledge of marine mammal biology; or
- are likely to identify, evaluate, or resolve conservation problems.

² **Harassment:** Under the 1994 Amendments to the MMPA, harassment is statutorily defined as, any act of pursuit, torment, or annoyance which—

(Level A harassment) has the potential to injure a marine mammal or marine mammal stock in the wild; or, **(Level B harassment)** has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering but which does not have the potential to injure a marine mammal or marine mammal stock in the wild.

Options for How to Apply

You can use these instructions to prepare a Letter of Intent which will be submitted via mail or email. An alternative is to use our online system, Authorizations and Permits for Protected Species (APPS). Go to <https://apps.nmfs.noaa.gov> and then click on Online Application Instructions in the left Features box for instructions.

If you have questions about these instructions or using APPS to submit a Letter of Intent, please call the Permits Division at 301-427-8401.

Application Layout

If you choose to use these instructions instead of applying via APPS, there is no strict format for how your LOI should look. However, the required information is divided into five basic sections. You should structure your LOI in a similar manner. The sections are:

- 1) **Project Information, Description, and Supplemental Information** – these sections require specific information about your project, such as the duration and timing of your work, hypothesis/justification, description of methods, and other information.
- 2) **Location and Take Information** – this section requires information about the places you are requesting to work, the numbers and types of protected species you expect to take and the methodologies you will use to conduct your research or enhancement activities.
- 3) **NEPA** – this section requires information about what impacts your activities might have on the environment, including the physical and biological aspects of the environment.
- 4) **Project Contacts** – this section requires information on the Applicant/Permit Holder, Principal Investigator, Co-investigators, or others that will be working under the LOC.
- 5) **Certification** – you will need to include the certification statement and sign your LOI before submitting it to the Permits Division.

Part 1: Project Information, Description, and Supplemental Information

Project Information

A. Project Title

Describe the project as concisely and descriptively as possible. Include the species (or taxa if multiple species), the study's geographic range, and purpose. For example:

- “*Characterizing the Population Structure and Movement Patterns of Bottlenose Dolphins in the Gulf of Mexico.*”

B. Previous Federal permit number

If applicable, please list your most recent NMFS permit or LOC number. If you have/had more than one permit, list the permit most closely related to this application.

C. Research Timeframe

List the proposed start and end dates of the entire project. Please review the “When to Apply” section above and provide realistic dates based on processing time.

- The start date must not be prior to the date you successfully submit your LOI.
- The end date must be within five years of the start date.
- You may enter more specifics on your project dates/field seasons under “Sampling Season/Project Duration” (see below).

D. Sampling Season/Project Duration

Describe the annual sampling season(s) and the duration of the project. Include the months of the year and frequency of fieldwork (e.g., how many times per year and how frequently will you conduct research?).

If your research extends beyond five years, or is a continuation of previously authorized research, include information here about when the research began and when you expect it to end.

E. Abstract

Provide a brief summary (approximately 200 words) of the proposed research project. The summary should include **concise** statements of the following information:

- Purpose of the research activity;
- Target species (common and scientific names);
- Type of take activities (e.g., photo-id, aerial surveys);
- Species that may be taken incidentally;
- Specific geographic location(s); and
- Requested duration of the LOC (e.g., five years).

Project Description

F. Project Purpose: Hypothesis/Objectives and Justification

Explain the purpose of the research, including a description of how the proposed research qualifies as “*bona fide* scientific research.”

This includes, but is not limited to, the following information:

- Hypothesis and objectives;
- How the results of the research are likely to contribute to the basic knowledge of marine mammal biology or are likely to identify, evaluate, or resolve conservation problems;
- How the research relates to the current body of knowledge on the subject species or past NMFS permitted research conducted by the applicant (if applicable).

G. Project Description

This section should clearly describe the methods you will use, the number of animals you expect to encounter, and the locations in which you will take them. This section should provide the reader with a clear picture of what will systematically happen during a typical day/field season of research activities.

Provide **detailed methods** for each take activity, including but **not limited to** descriptions of the following:

- Platform types (vessel or aircraft description)
- Aerial and vessel survey type and routes (attach figure if possible)
- Approach distances (by aerial, vessel, or ground)
- Approach techniques (speed, direction in relation to animals)
- Photo-identification techniques.

Please make sure your methods are detailed enough for us to evaluate potential effects. Refer to Appendix A for guidance on what level of detail is required.

Cite **references** for the methods where applicable, but do not substitute a literature citation in lieu of a complete description of the methods.

Include the **purpose of each take activity**. How do these take activities relate to meeting your objectives?

Describe **the steps you will take to coordinate** or collaborate with other researchers in your action area. Also, mention if you will be contributing to a regional photo-id catalog.

Describe **the location** where you will conduct your research. Indicate whether the location you will work in has been given special status (e.g., National Marine Sanctuary, State Reserve).

Indicate the **species and estimated number of non-target species** that you may affect each year, and the manner in which you may affect them during your research.

If you may encounter non-target species in your study area but do **not** expect to affect them in any way, please describe why and any actions you will take to prevent impact. For example, the GA does not authorize you to take threatened or endangered species. If ESA-listed species occur in your study area, please explain how you will avoid them (e.g., not in area during time of study; would not approach closer than 100 meters; would halt operations until non-target species moved out of study area).

Describe how your proposed activities coincide with or avoid sensitive biological periods such as reproductive seasons and maternal care of both target and non-target species.

Project Supplemental Information

You are encouraged to provide additional files that help supplement your LOI.

H. Supplemental Information

You may attach files if you wish to provide additional information that may help explain your proposed research. Examples include: figures or photographs to illustrate your methods, maps of your study area, etc.

I. References File

If your LOI contains citations to published work, you must include a list of references. References contain bibliographic information that would allow a reader to obtain a copy of the referenced work.

Note: Referenced materials must be made available to the Permits Division upon request, as needed for evaluation of your LOI, or preparation of any necessary NEPA analyses. Note that all documents referenced in support of your LOI must be available to the public upon request. Do not reference confidential documents, or other information you are not willing to provide to the public at the time your application is submitted.

Part 2: Location and Take Information

J. Location Information

First, you'll need to describe the location(s) where you plan on conducting research.

Please note that NMFS does not have jurisdiction in the **territorial** waters of another country and therefore cannot authorize the take of protected species in those waters. For U.S. citizens, activities beyond territorial waters are considered to occur on the high seas and need coverage by a NMFS permit.

For each location, please provide a description that includes the following, as applicable:

- State(s)
- Names of rivers, estuaries, bays, etc.
- Latitude and longitude of your study area
- River miles (“Begin Mile” and “End Mile”)
- Limits of your study area (e.g., to the U.S. EEZ, to the edge of the continental shelf, to 50m depth)
- Names of land masses where research will occur (e.g., islands, rookeries)

K. Take Information

For each location, you’ll need to provide information on which species you expect to harass, how many animals you expect to harass (“take”) annually, and what activities you plan to conduct. The take table represents **estimated annual** takes of animals during your research. You should fill out a separate table for each location where you plan to work. Please fill out the following take table, with one species per row, using the directions below the table:

Table 1. Example take table.

SPECIES	LISTING UNIT/ STOCK	LIFE STAGE	SEX	EXPECTED TAKE	TAKES PER ANIMAL	OBSERVE/ COLLECT METHOD	PROCEDURES	DETAILS
Cetaceans						Survey, aerial; survey, ground; survey, vessel; survey, aerial/vessel; other	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photogrammetry; Photo-id; Photograph/video; Sample, fecal; Underwater photo/videography	
Pinnipeds						Survey, aerial; survey, ground; survey, vessel; other	Acoustic, passive recording; Collect, molt; Collect, scat; Collect, spew; Collect, urine; Count/survey; Incidental disturbance; Observation, monitoring; Observations, behavioral; Other; Photogrammetry; Photo-id; Remote video monitoring	

The columns in your take table should include:

- 1) **Species:** Enter one species per row. Remember, the GA is for non-listed species only. Do not include Endangered/Threatened species in your table.

Note: For a complete list of species and stocks, visit <http://www.nmfs.noaa.gov/pr/species/mammals/>.

- 2) **Listing Unit/Stock:** Enter the marine mammal stock you will be researching. Choose “Range-wide” if, for example, your location has multiple stocks of the same species and you cannot distinguish between them while in the field.

Note: For a complete list of species and stocks, visit <http://www.nmfs.noaa.gov/pr/species/mammals/>.

- 3) **Life Stage:** Enter the applicable life stage. You may enter take information for more than one life stage (e.g., adult versus juvenile) on separate rows or select a combination of life stages for one take category. If the same activities will be directed towards all life stages, say “All.”
- 4) **Sex:** Enter a sex. If your activity targets only one sex, indicate which. If it targets both and they can be targeted separately, enter separate rows for male and female; otherwise select “Male and Female.”
- 5) **Expected Take:** This represents a reasonable estimate of the number of animals you will encounter, annually. You will not be limited to this number or penalized if you exceed this number.
- 6) **Takes Per Animal:** Estimate the number of times an individual will be encountered, annually.
- 7) **Observe/Collect Method:** Enter one observe/collect method from Table 1 per row. If various methods will be used, you must provide take information in separate rows for each observe method.
- 8) **Procedures:** Provide specific information on the research activities that will be conducted, using the options in Table 1 above. Choose “Other” if your proposed activity is not listed. In the “Details” box (see below), briefly describe what the “Other” means.

Note: The procedures list in Table 1 above includes only activities that would qualify as Level B harassment.

- 9) **Details:** You may use this column to provide details on each take table row.

Part 3: National Environmental Policy Act (NEPA)

L. NEPA Information

To assist us in our required NEPA analysis, please provide information on the following five environmental impact consideration criteria. If you believe any of the criteria are “not applicable” to your project, please explain why.

1. If your activities will involve equipment (e.g., scientific instruments) or techniques that are new, untested, or otherwise have unknown or uncertain impacts on the biological or physical environment, please discuss the degree to which they are likely to be adopted by others for similar activities or applied more broadly.
2. If your activities involve collecting, handling, or transporting potentially infectious agents or pathogens (e.g., biological specimens such as live animals or blood), or using or transporting hazardous substances (e.g., toxic chemicals), provide a description of the protocols you will use to ensure public health and human safety are not adversely affected, such as by spread of zoonotic diseases or contamination of food or water supplies.
3. Describe the physical characteristics of your project location, including whether you will be working in or near unique geographic areas such as state or National Marine Sanctuaries, Marine Protected Areas, Parks or Wilderness Areas, Wildlife Refuges, Wild and Scenic Rivers, designated Critical Habitat for endangered or threatened species, Essential Fish Habitat, etc. Discuss how your activities could impact the physical environment, such as by direct alteration of substrate during use of anchoring vessels or buoys, erecting blinds or other structures, or ingress and egress of researchers, and measures you will take to minimize these impacts.
4. Briefly describe important scientific, cultural, or historic resources (e.g., archeological resources, animals used for subsistence, sites listed in or eligible for listing in the National Register of Historic Places) in your project area and discuss measures you will take to ensure your work does not cause loss or destruction of such resources. If your activity will target marine mammals in Alaska or Washington, discuss measures you will take to ensure your project does not adversely affect the availability (e.g., distribution, abundance) or suitability (e.g., food safety) of these animals for subsistence uses.
5. Discuss whether your project involves activities known or suspected of introducing or spreading invasive species, intentionally or not, (e.g., transporting animals or tissues, discharging ballast water, use of equipment at multiple sites). Describe measures you would take to prevent the possible introduction or spread of non-indigenous or invasive species, including plants, animals, microbes, or other biological agents.

Part 4: Project Contacts

M. Personnel Information

In this section you will list information about the people who will be responsible for overseeing the project and others who will be working under the LOC. The key roles are: **Applicant/Permit Holder, Principal Investigator, and Primary Contact**. See the directions below for how to decide who is assigned to these roles. The following table and the definitions that follow explain the differences between the personnel roles. The Applicant, Principal Investigator, and Primary Contact can be the same person.

	Able to make changes to application	Must be named in the LOI	CV, resume, or list of qualifications required	Receive automatic emails from APPS	Can request modifications and submit annual reports
Applicant/Holder	Yes	Yes	Yes	Yes	Yes
Responsible Party	Yes	Yes (only if Holder is an entity)	No (If they are participating in the research they should also be listed as a Co-investigator)	Yes	Yes
Principal Investigator	Yes	Yes	Yes	Yes	Yes
Primary Contact	Yes	Yes	No	Yes	Yes
Co-Investigator	No	Yes	Yes	No	No
Other personnel (e.g., Research Assistants)	No	No	No	No	No

Applicant/Permit Holder – The person, institution, or agency that is ultimately responsible for all activities of any individual who is operating under the authority of the LOC. Where the Permit Holder is an institution or agency, the **Responsible Party** is the official who has the legal authority to bind the organization (see definition below).

Note: The Applicant becomes the Permit Holder once an LOC is issued. There can be only one Applicant/Permit Holder. LOCs are not transferable from one Permit Holder to another and the Applicant/Permit Holder cannot be changed. In many cases, the Applicant/Permit Holder may be the same as the Principal Investigator (PI) and/or Primary Contact. All requests related to the LOC must be submitted in writing (email accepted) by the Permit Holder or Principal Investigator. The request may come from the PI if the PI has signed the LOI.

Responsible Party – This role is only used if the **Applicant/Permit Holder** is designated as an agency or organization. The Responsible Party is an official who has the legal authority to bind the organization, institution, or agency that is ultimately responsible for all activities of any individual who is operating under the authority of the LOC.

Note: Where an applicant is an organization, institution, or agency rather than an individual, the LOI must be signed by the Responsible Party. An example is that

the Responsible Party for a National Marine Fisheries Service (NMFS) Science Center is the Center Director. The Responsible Party can change with approval from the agency issuing the LOC.

Principal Investigator (PI) - The individual primarily responsible for the taking, and any related activities conducted under an LOC. The PI must have qualifications, knowledge and experience relevant to the type of research activities authorized by the LOC.

Note: The PI must be on site during any activities conducted under the LOC unless a **Co-Investigator** is present to act in place of the PI. There can be only one PI on a permit. The PI may also be the Applicant/Permit Holder and Primary Contact. Because the PI supervises the research, NMFS requires that the PI submit a CV/resume.

Co-investigator (CI) – Individuals who are qualified and authorized to conduct or directly supervise activities conducted under an LOC without the on-site supervision of the **PI**.

Note: CIs assume the role and responsibility of the PI in the PI's absence. There can be numerous CIs designated under a single LOC. The CI is authorized to work independently in the field or lead a field crew. For example, there could be separate CIs in charge of distinct activities/projects under an LOC, or responsible for distinct geographic areas under a permit. Because a CI can supervise research, NMFS requires that a CV/resume be provided for each CI. There can be only one PI per application. If a project has multiple principals, one person must be assigned the PI role and the others assigned CI roles.

Primary Contact – The person primarily responsible for correspondence during the LOI review process and after an LOC is issued.

Note: The Primary Contact may be separate from or hold any other role on the LOC (Applicant/Permit Holder, PI, etc.). While the Primary Contact will have access to an Applicant/Permit Holder's Portfolio and may engage in correspondence on behalf of the Applicant/Permit Holder (such as providing minor clarifications for information in the application, making inquiries as to the status of an application and the application process, and submitting reports on behalf of the Applicant/Permit Holder), any substantive changes or requests for modifications must be submitted by the Applicant/Permit Holder or PI.

N. Qualifications and Experience

You are required to submit the following information about the qualifications and experience of the Principal Investigator and all Co-investigators. If the information below is already contained in a person's CV/resume, you may simply attach the CV to your LOI. However, if the CV does not illustrate that the person has field experience

relevant to your proposed research (e.g., a sea turtle biologist with no background in cetacean research listed in their CV), you will need to provide an additional statement that provides evidence of such experience.

Note: All documentation submitted will be publicly available. **DO NOT include personal information**³ in your documentation.

Contact Information

- Full Name (as it appears on driver's license, passport, etc.)
- Email address
- Business mailing address, phone, and fax

Education & Training

- Degree, year, major, name of institution
- Certificates or Licenses, relevant dates (year received, expiration date)
- Other training or certification relevant to the permitted activity, date (e.g., dive certification, animal handling course)

*Experience*⁴

- Current position title, name of employer
- List of duties to be performed under the permit
- Brief description of when and how you obtained expertise in the proposed methods you will be conducting and supervising, whether you have performed them without supervision and when you supervised others' performance

*Annotated Publication History*⁵

- Authors, Date, Title, Journal (or book, etc.), applicable permit number

You may also include personnel who perform other roles (e.g., Research Assistants) to your LOI.

Part 5: Certification

O. Certification Statement

You must include the following certification statement in your LOI and it must be signed and dated by the applicant:

³ **DO NOT** include social security number, date of birth, nationality, marital status, home phone or address (unless it is also the business address), salaries, or other personal information.

⁴ Address how you are qualified to perform the proposed activities and to supervise the performance of others acting under the permit (e.g., research assistants, vessel operators).

⁵ This does not need to be exhaustive. The intent is to show that the individual has or is reasonably likely to publish in peer reviewed journals or otherwise make results of permitted research available.

“In accordance with section 104(c)(3)(C) of the Marine Mammal Protection Act of 1972, as amended (16 U.S.C. 1361 et seq.) and implementing regulations (50 CFR part 216) I hereby notify the National Marine Fisheries Service of my intent to conduct research involving only Level B harassment on marine mammals in the wild, and request confirmation that the General Authorization for Level B Harassment for Scientific Research applies to the proposed research as described herein. I certify that the information in this letter of intent is complete, true, and correct to the best of my knowledge and belief, and I understand that any false statement may subject me to the criminal penalties of 18 U.S.C. 1001, or penalties under the MMPA and implementing regulations. I acknowledge and accept that authority to conduct scientific research on marine mammals in the wild under the General Authorization is a limited conditional authority restricted to Level B harassment only, and that any other take of marine mammals, including the conduct of any activity that has the potential to injure marine mammals (i.e., Level A harassment), may subject me to penalties under the MMPA and implementing regulations.”

Submit your LOI

You can submit your LOI in one of the following ways:

- Via email. Call the Permits Division at 301-427-8401 to find out who you should email it to.
- Via fax to 301-713-0376
- Via postal mail to:

Chief, Permits and Conservation Division
Office of Protected Resources, F/PR1
NOAA/National Marine Fisheries Service
1315 East-West Highway, Room 13705
Silver Spring, MD 20910

What happens after I submit?

Your LOI will be assigned to two permit analysts who will review your application and assign it a file number. They will contact you with any questions or concerns.

After review and processing, the Chief, Permits Division will issue a letter which either:

1. Confirms that the GA applies to the proposed scientific research as described in the LOI (i.e., a Letter of Confirmation);

2. Notifies you that all or part of the research described in the LOI cannot be conducted under the GA because it is likely to result in a taking of a marine mammal in the wild by other than Level B harassment and, as a result, a scientific research permit is required to conduct all or part of the research; or
3. Notifies you that the LOI fails to provide sufficient information and providing a description of the deficiencies, or notifies you that the proposed research as described in the letter of intent is not *bona fide* research as defined above.

Requesting a Modification

The Director, Office of Protected Resources, may amend or modify an LOC in response to or independent of a request from the Permit Holder. Amendments and modifications are subject to additional analyses under NEPA.

If you wish to modify your LOC, please describe your request using the instructions for submitting an LOI. For sections where nothing will change, please state this. You may also submit a modification request using the APPS system (<https://apps.nmfs.noaa.gov>).

Modifications to the following may require the same amount of time to process as a new Letter of Intent:

- the species to be taken;
- expansion or addition of new locations;
- change in methods; and
- extension of the expiration date.

Other requests such as changing personnel or allowing a film crew to accompany the researchers may be authorized relatively quickly.

Additional Information

Under section 104(c)(3)(C) of the MMPA, as amended, persons may be authorized to take marine mammals in the wild by Level B harassment, as defined in 50 CFR 216.3, for purposes of *bona fide* scientific research. Interested persons are required to submit a letter of intent in accordance with the interim final rule published on October 3, 1994 and submit certain information outlined at 50 CFR 216.45(b) under the General Authorization and provided in these instructions. Regulations implementing the GA may be found at 50 CFR 216.45 [59 FR 50376, Oct. 3, 1994] and are available at the following web site: <http://www.gpo.gov/>. MMPA section 104 is available at the following web site: <http://www.nmfs.noaa.gov/pr/pdfs/laws/mmpa104.pdf>.

Paperwork Reduction Act Statement:

The information requested in this application is required and is used to determine whether the research described in the letter of intent is likely to exceed Level B harassment of a marine mammal in the wild, whether a scientific research permit is required to conduct all or part of the subject research, and whether the research as described in the letter of intent is *bona fide*.

Public reporting burden for this collection of information is estimated to average 10 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Chief, Permits and Conservation Division, Office of Protected Resources, F/PR1, NOAA/National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910.

The letter of intent and any associated documents, including any reports required under the GA, are considered public information and as such, are subject to the Freedom of Information Act.

Notwithstanding any other provision of the law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork Reduction Act, unless that collection of information displays a currently valid OMB Control Number.

Appendix A. 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:

- *Cetaceans*
- *Pinnipeds*

Procedures for Surveys

This table describes the type of information to include in an LOI 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.

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.

In general, you should always indicate

- how long a procedure will take, including average and maximum times
- how close you will get to the animals during the activity (average and minimum)
- 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	APPS menu selection	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
Behavioral observations	Behavioral observations	Behavioral observations
Photo-identification	Photo-id	Approach method (aerial, ground, vessel) Closest approach distance Approaches per animal (e.g., per day) Duration per animal/group

Procedure	APPS menu selection	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

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.

Discuss the duration of these effects and responses as it relates to recovery to pre-research state. For example, describe the typical time after a survey before animals return to pre-disturbance behaviors.

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. 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.

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