PROPOSED ACTION:	Issuance of an Amendment to Scientific Research Permit No. 22156-04 for Cetacean Research
TYPE OF STATEMENT:	Final Environmental Assessment
LEAD AGENCY:	U.S. Department of Commerce National Oceanic and Atmospheric Administration National Marine Fisheries Service
RESPONSIBLE OFFICIAL:	Kimberly Damon-Randall Director, Office of Protected Resources National Marine Fisheries Service
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LOCATION:	U.S. and International Waters of the Northwest Atlantic Ocean
ABSTRACT:	This Environmental Assessment analyzes the environmental impacts of the National Marine Fisheries Service, Office of Protected Resources' proposal to issue an amendment to Scientific Research Permit No. 22156-04 to Douglas Nowacek, Ph.D., to paintball mark two cetacean species during research.
DATE:	October 13, 2023

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Chapter 1 Introduction and Purpose and Need

1.0 Introduction

The National Oceanic Atmospheric Administration's (NOAA's) National Marine Fisheries Service (NMFS), received a request from Douglas Nowacek, Ph.D., to amend his research permit, No. 22156-04, to allow an additional procedure be conducted, paintball marking, on two cetacean species, bottlenose dolphins (*Tursiops truncatus*) and short-finned pilot whales (*Globicephala macrorhynchus*), during authorized cetacean research. The current permit authorizes take of 30 cetacean species in U.S. and international waters of the North Atlantic Ocean to study variation in cetacean behavior, foraging ecology, body condition, health status, population structure, and use of and response to sounds.

Pursuant to the Endangered Species Act (ESA; 6 U.S.C. 1531 et seq.) and Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 et seq.), NMFS is responsible for the management of all cetaceans and pinnipeds (except walruses[1]) in the United States and its territorial waters. In addition, any person, including citizens of foreign countries, who wants to take, import, or export any species of cetacean or pinniped under the jurisdiction of NMFS or any parts or products thereof, must obtain a permit. This includes the intentional taking of ESA-listed or non-ESA listed marine mammals for scientific purposes or enhancing the propagation or survival of such species (50 Code of Federal Regulations [CFR] Parts 216 and 222-227).

In addition, the National Environmental Policy Act (NEPA; 42 United States Code (U.S.C.) 4321 et seq.), the Council on Environmental Quality (CEQ) Regulations (40 CFR Parts 1500 to 1508[2]), and NOAA policy and procedures[3] for implementing NEPA require NMFS to consider the potential environmental impacts of a proposed action before making a decision. NMFS' issuance of a permit amendment allowing intentional take of marine mammals under the ESA and MMPA is a major federal action. Therefore, NMFS analyzes the environmental effects associated with its decision of whether to authorize intentional take of marine mammals associated with the applicant's proposed scientific research, conducts an environmental review, and prepares the appropriate NEPA documentation.

In the present case, NMFS conducted an environmental review of Dr. Nowacek's current permit and amendment request and determined an Environmental Assessment (EA) is appropriate for the issuance of the amendment. Therefore, this EA discusses the environmental review and analysis associated with NMFS' decision making regarding Dr. Nowacek's permit amendment request.

This Chapter summarizes NMFS' authority to authorize directed take of two non-ESA-listed marine mammal species and the applicant's amendment request, and identifies NMFS' proposed

[1] The U.S. Fish and Wildlife Service (USFWS) has jurisdiction for walrus. In addition, take of walruses, polar bears, sea otters, and manatees is regulated under the MMPA and ESA, under the jurisdiction of the USFWS.

[2] This EA is being prepared using the 2020 CEQ NEPA Regulations as modified by the Phase I 2022 revisions. The effective date of the 2022 revisions was May 20, 2022, and reviews begun after this date are required to apply the 2020 regulations as modified by the Phase I revisions unless there is a clear and fundamental conflict with an applicable statute. This EA began on November 11, 2022, and accordingly proceeds under the 2020 regulations as modified by the Phase I revisions.

[3] NOAA Administrative Order [NAO] 216-6A and the Companion Manual for NAO 216-6A

action and purpose and need. This Chapter also explains the background and environmental review process associated with Dr. Nowacek's current permit and provides other information relevant to the analysis in this EA, such as the scope of the analysis. The remainder of this EA is organized as follows:

- Chapter 2: Description of the applicant's activities and the alternatives carried forward for analysis as well as alternatives not carried forward for analysis
- Chapter 3: Description of the baseline conditions of the affected environment
- Chapter 4: Direct, indirect, and cumulative impacts to the affected environment, specifically impacts to the subject two cetacean species associated with NMFS' proposed action and alternatives
- Chapter 5: Document preparers
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1.1 Marine Mammal Protection Act Overview

When the MMPA was enacted in 1972, Congress made several findings concerning the protection and preservation of marine mammals, including, but not limited to, that "certain species and population stocks of marine mammals are or may be in danger of extinction or depletion as a result of man's activities" (16 U.S.C. 1361(1)) [and] "such species and population stocks should not be permitted to diminish beyond the point at which they cease to be a significant functioning element in the ecosystem of which they are a part[…]" (16 U.S.C. 1361(2)) [and that] "marine mammals…[are] resources of great international significance… [that] should be protected and encouraged to develop to the greatest extent feasible commensurate with sound policies of resource management and the primary objective of their management should be to maintain the health and stability of the marine ecosystem[…]." (16 U.S.C. 1361(6)) These and other findings listed in Section 2 of the MMPA, clearly speak to the need to maintain a broad scope that considers species and ecosystem level impacts.

To serve these broader goals, the MMPA prohibits take of all marine mammals in the United States, including territorial seas. Take[4] means to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal. Harassment[5] is any act of pursuit, torment, or annoyance that has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment) or has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns (Level B harassment). Disruption of behavioral patterns includes, but is not limited to, migration, breathing, nursing, breeding, feeding or sheltering. However, there are exceptions to the prohibition on take in Section 104 of the MMPA, that gives NMFS the authority to issue permits for intentional take associated with *bona fide*[6] scientific research on marine mammals or to enhance the survival or recovery of a species or stock, provided certain determinations are made and statutory and regulatory procedures are met. This includes specifying the number and species of animals that can be

[4] As defined in the MMPA Section 3(13).

[5] As defined in the MMPA for non-military readiness activities (Section 3(18)(A)).

[6] *Bona fide* scientific research means research on marine mammals, conducted by qualified individuals, the results of which: 1) are likely to be accepted for publication in a refereed scientific journal; 2) are likely to contribute to the basic knowledge of the species biology or ecology; or 3) are likely to identify, evaluate, or resolve conservation problems.

taken and designating the manner (e.g., method, dates, locations) in which the takes may occur. Section 104 also allows *bona fide* scientific research that would result only in take by Level B harassment of marine mammals under a General Authorization (GA). NMFS has sole jurisdiction for issuance of such permits and authorizations for all cetaceans, and for all pinnipeds except walrus.

In addition, NMFS may issue a scientific research permit or GA pursuant to Section 104 of the MMPA to an applicant who submits information indicating that the taking is required to further a *bona fide* scientific purpose. An applicant must also demonstrate the taking will be consistent with the purposes of the MMPA and applicable regulations. If lethal taking of a marine mammal is requested, the applicant must demonstrate that a non-lethal method of conducting research is not feasible. In the case of proposed lethal taking of a marine mammal from a stock listed as "depleted," NMFS must also determine the results of the research will directly benefit the species or stock, or otherwise fulfill a critically important research need.

NMFS promulgated regulations to implement the permit provisions of the MMPA (50 CFR Part 216) and produced the Office of Management and Budget-approved application instructions that prescribe the procedures (including the form and manner) necessary to apply for permits. All applicants must comply with these regulations and application instructions in addition to the provisions of the MMPA. The implementing regulations are available for review at: https://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title50/50cfr216_main_02.tpl. The application information are available for review on NOAA Fisheries' website: https://media.fisheries.noaa.gov/2023-05/MMPA-ESA-research-enhance-instructions-0.docx.

1.2 Summary of Scientific Research Permit Amendment Request

1.2.1 Receipt of Application Overview

Permit No. 22156 was originally issued to Dr. Nowacek on May 8, 2020, authorizing take of 30 cetacean species in the Northwest Atlantic Ocean to study variation in cetacean behavior, foraging ecology, body condition, health status, population structure, and use of and response to sounds. Research may occur in the U.S. Exclusive Economic Zone (EEZ) and international waters from Maine to Florida and international waters offshore of Canada and the Caribbean. The permit was first amended (as Permit No. 22156-01) by NMFS on January 29, 2021, to update mitigation measures required for biopsy sampling bottlenose dolphins in coastal areas. NMFS amended the permit (No. 22156-02) on May 3, 2022, to allow researchers to conduct unmanned aircraft system (UAS) operations and associated sampling of exhaled air to all species, rather than a subset of species, authorized under the permit. The permit was amended a third time (as Permit No. 22156-03) on March 15, 2023, to add dart tagging to the suite of research methods authorized for juveniles and adults of 12 cetacean species and increase the number of fin whales (*Balaenoptera physalus*) authorized for dart tagging. The permit was amended a fourth time (as Permit No. 22156-04) on June 30, 2023, to allow blow sampling of authorized species by pole instead of by UAS when weather conditions are not conducive for UAS operations. Authorized take for activities under Permit No. 22156-04 include surveys by vessel and a UAS to approach, count, observe, photograph, remotely measure, and track cetaceans. During surveys, researchers may conduct acoustic playback trials in the presence of animals, collect biological samples (exhaled air, skin and blubber biopsies, and sloughed skin), and tag (by suction cup or dart/barb) animals, with some species receiving two tags at a time.

The current permit also authorizes unintentional harassment for non-target cetaceans that may be in the vicinity of research. Biological samples collected in international waters may be imported into the United States and cell lines may be developed from tissue samples. This EA analyzes a request from Dr. Nowacek to amend Permit No. 22156-04 to conduct an additional procedure, paintball marking, on bottlenose dolphins and short-finned pilot whales, during authorized take for cetacean research surveys. This amendment would allow researchers to temporarily mark short-finned pilot whales and bottlenose dolphins with paintballs, as a pilot study to investigate how social marine mammals coordinate dive patterns.

1.3 Purpose and Need

1.3.1 Description of Proposed Action

NMFS proposes to amend Permit No. 22156-04, held by Dr. Nowacek to authorize the described paintball marking of short-finned pilot whales and bottlenose dolphins, including additional mitigation and monitoring. Annual take numbers for these species would not increase. The amendment would be valid for the duration of the permit, until May 31, 2025. NMFS' proposed action is a direct outcome of the applicant's request to conduct this procedure on these two species in connection with Dr. Nowacek's currently authorized scientific research activities under Permit No. 22156-04.

1.3.2 Purpose

The purpose of NMFS' action is to authorize take for an additional research activity conducted on short-finned pilot whales and bottlenose dolphins during scientific research surveys, as proposed by Dr. Nowacek. Paintball marking has the potential to cause harassment and injury of the target marine mammals, and thus the activities warrant a permit amendment from NMFS. The permit amendment would provide an exception to Dr. Nowacek from the MMPA's take prohibition, by allowing paintball marking of short-finned pilot whales and bottlenose dolphins.

To authorize take of marine mammals, NMFS must make several findings regarding Dr. Nowacek's proposed research activities. NMFS evaluates the best available scientific information to determine if the proposed research activities and methods are "humane"[7] and would not result in unnecessary risks to the health or welfare of the animals. NMFS must determine whether the proposed research activities would be conducted for *bona fide* and necessary purposes. NMFS cannot issue permits or permit amendments under the MMPA if it cannot make these findings. Any proposed permitted activity must be consistent with the MMPA and its implementing regulations. In addition, permits must set forth, where applicable, the permissible methods of taking and requirements pertaining to the monitoring and reporting of such takings.

1.3.3 Need

Anyone seeking a permit under section 104 of the MMPA for take of marine mammals under NMFS' jurisdiction must submit an application. Because Dr. Nowacek submitted an application setting forth the rationale and potential eligibility for a permit amendment, NMFS has a corresponding duty to determine whether and how to authorize take of marine mammals.

[7] The MMPA defines humane in the context of the taking of a marine mammal, as "that method of taking which involves the least possible degree of pain and suffering practicable to the mammal involved."

Therefore, NMFS' responsibilities under Section 104 of the MMPA and its implementing regulations establish and frame the need for NMFS' proposed action.

1.4 Environmental Review Process and Background

The issuance of permits for research on marine mammals typically falls within NOAA's categories of actions that "…normally do not have a significant effect on the human environment, and therefore do not require preparation of an environmental assessment or environmental impact statement." (40 CFR 1501.4)

There are two categories associated with NMFS' issuance of permits for "take" of animals. The first, categorical exclusion (CE) B1, applies to issuance of permits under the ESA and is not applicable here. The second, CE B2, applies to "*Issuance of permits or permit amendments under Section 104 of the MMPA for take or import of marine mammals for scientific research, enhancement, commercial or educational photography or public display purposes; and issuance of Letters of Confirmation under the General Authorization for scientific research involving only Level B harassment*[8]."

When NMFS receives an application for a new permit or a permit amendment, NMFS reviews the application for adequacy (per the MMPA and its implementing regulations) and to determine what level of analysis under NEPA is required to support the decision whether to issue any given permit or permit amendment.

NMFS determined the initial issuance of Permit No. 22156 to Dr. Nowacek qualified for a CE. Since issuance on May 8, 2020, the permit was amended on four occasions. The first two were deemed minor amendments under the MMPA because NMFS determined the impacts associated with the amendment issuance would not have an effect to the species or stocks, or trigger extraordinary circumstances with the potential for significant environmental effects, in a manner not previously considered. The third amendment was deemed a major amendment under the MMPA because it increased the number of takes authorized for dart tagging for several authorized cetacean species under the permit. The most recent amendment, No. 22156-04, was also deemed a minor amendment because NMFS determined the impacts associated with the amendment issuance would not have an effect to the species or stocks, or trigger extraordinary circumstances with the potential for significant environmental effects, in a manner not previously considered.

To assist NMFS' decision making regarding this permit amendment request (File No. 22156-05), NMFS prepared this EA to analyze the potential for adverse impacts to short-finned pilot whales and bottlenose dolphins that may result from authorizing take for paintball marking of these species.

1.5 Public Involvement

In accordance with NEPA, CEQ Regulations, and NOAA policy and procedures, NMFS, to the fullest extent possible, integrates the requirements of NEPA with other regulatory processes required by law or by agency practice so that all procedures run concurrently, rather than

[8] NOAA's full list of approved CE categories is in Appendix E of the Companion Manual for NAO 216-6A.

consecutively. This includes coordination within NOAA, (e.g., the Office of the National Marine Sanctuaries) and with other regulatory agencies (e.g., the U.S. Fish and Wildlife Service [USFWS]), as appropriate, during NEPA reviews, prior to implementation of a proposed action to ensure that requirements are met. For issuance of a permit or permit amendment under Section 104 of the MMPA, we rely substantially on the public process required by these laws to develop and evaluate relevant environmental information as well as provide a meaningful opportunity for public participation when we prepare corresponding NEPA documents.

Although agency procedures do not require publication of the draft EA prior to finalizing an EA, NMFS is relying substantially on the public process pursuant to the MMPA, to develop and evaluate environmental information relevant to an analysis under NEPA. For this action, the *Federal Register* notice (FRN; 88 FR 2070, January 12, 2023) of the proposed permit amendment included a description of the proposed action, the potential effects of the project on marine mammals, their habitat and NMFS' preliminary determination that the action will not result in significant impacts to any portion of the human environment. The FRN of the proposed permit amendment, the draft EA, and the corresponding public comment period are instrumental in providing the public with information on relevant environmental issues and offering the public a meaningful opportunity to provide comments for NMFS' Office of Protected Resources' (OPR's) consideration in both the MMPA and NEPA processes.

NMFS alerted the public in the FRN that it intended to use the MMPA public review process for the proposed permit amendment to solicit relevant environmental information and provide the public an opportunity to submit comments. During the 30-day public comment period, no comments from the public were received. NMFS received a letter from the Marine Mammal Commission (Commission) on February 7, 2023, stating that the Commission believes that the proposed activities meet the MMPA's humaneness and *bona fide* criteria and recommends that NMFS issue the amendment as requested.

1.6 Other Environmental Laws or Consultations

NMFS must comply with all applicable federal environmental laws and regulations necessary to implement a proposed action. NMFS' evaluation of, and compliance with, environmental laws and regulations is based on the nature and location of the applicant's proposed activities and NMFS' proposed action. Therefore, this section summarizes only those environmental laws and consultations applicable to NMFS' issuance of the scientific research permit amendment to Dr. Nowacek.

1.6.1 Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA)

Under the MSFCMA, federal agencies are required to consult with the Secretary of Commerce with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency which may adversely affect essential fish habitat (EFH) identified under the MSFCMA.

For the original permit and amendments, the NMFS' OPR Permits and Conservation Division (hereinafter Permits Division) determined that the permitted activities would not affect designated EFH and did not initiate consultation with any of the NMFS Regional Offices of Habitat Conservation. The action is directed at marine mammals and would not affect fish

habitat. The activities do not involve alteration of substrate, or other interactions with physical features of ocean and coastal habitat. No other interactions with physical features of ocean and coastal habitat that could affect EFH would occur during research activities. It was determined that the activities are unlikely to affect the ability of the water column or substrate to provide necessary spawning, feeding, breeding or growth to maturity functions for managed fish. Likewise, authorizing the take of marine mammals is not likely to directly or indirectly reduce the quantity or quality of EFH by affecting the physical, biological or chemical parameters of EFH. Marine mammals have not been identified as a prey component of EFH for managed fish species, so authorizing the take of marine mammals is not expected to reduce the quantity and/or quality of EFH.

Authorizing take of marine mammals through the issuance of this permit amendment to Dr. Nowacek does not change the determinations made for EFH for the original permit or the prior permit amendments. There are no new activities proposed that would directly or indirectly affect the physical, biological, or chemical features of EFH. Therefore, pursuant to 2017 guidelines from the NOAA Office of Habitat Conservation on EFH, NMFS determined that the issuance of the permit amendment would not result in adverse impacts to EFH. Furthermore, NMFS determined that issuance of the permit amendment would not require separate consultation per Section 305(B)(2) of the MSFCMA as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267). For this reason, EFH is not discussed further in this EA.

1.6.2 Endangered Species Act

The ESA established various protections for conservation for threatened and endangered species and their habitat. An endangered species is a species in danger of extinction throughout all or a significant portion of its range, and a threatened species is one that is likely to become endangered within the near future throughout all or in a significant portion of its range.

The U.S. Fish and Wildlife Service (USFWS) and NMFS jointly administer the ESA and are responsible for listing and designating a species as either threatened or endangered as well as designating geographic areas as critical habitat for these species. The ESA generally prohibits the "take" of an ESA-listed species unless an exception or exemption applies. The term "take" as defined in Section 3 of the ESA means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Harm under the ESA is defined by regulation (50 CFR §222.102) as "an act which actually kills or injures fish or wildlife." Harass under the ESA is defined by NMFS guidance as to "create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering" (NMFS 2016a).

Section 7(a)(2) requires each federal agency to ensure that any action it authorizes, funds or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat of such species. When a federal agency's action may affect a listed species, that agency is required to consult with NMFS and/or the USFWS under procedures set out in 50 CFR Part 402.

Section 9 of the ESA and Federal regulations pursuant to Section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption such as by a permit. Permits to take ESA-listed species for scientific purposes or for the purpose of enhancing

the propagation or survival of the species, may be granted pursuant to Section 10(a)(1)(A) of the ESA. Specifically, Section 10(d) stipulates that, for NMFS to issue permits under Section 10(a)(1)(A), the Agency must find that the permit was applied for in good faith, if granted and exercised, will not operate to the disadvantage of the species and will be consistent with the purposes and policy set forth in Section 2 of the ESA.

NMFS promulgated regulations to implement the permit provisions of the ESA (50 CFR Part 222) and produced OMB-approved application instructions that prescribe the procedures (including the form and manner) necessary to apply for permits. All applicants must comply with these regulations and application instructions in addition to the provisions of the ESA. The implementing regulations are available for review on NOAA Fisheries' website: https://www.ecfr.gov/cgi-bin/text-idx?SID=92ff787ed81d57818af0ce3c1792e986&mc=true&node=pt50.10.222&rgn=div5.

Permit No. 22156-04 currently authorizes take for research on 31 cetacean species in U.S. and international waters of the North Atlantic Ocean. Species include endangered blue (*Balaenoptera musculus*), fin, sei (*B. borealis*), and sperm (*Physeter macrocephalus*) whales. Take for these species also includes unintentional harassment that could occur during research directed on other authorized cetacean species. To comply with Section 7 of the ESA, in 2019, the Permits and Conservation Division consulted programmatically on its cetacean permitting program with the NMFS ESA Interagency Cooperation Division. The resulting Programmatic Biological Opinion (BO; NMFS 2019) determined that issuance of permits for standard research methods on cetaceans is not likely to jeopardize the continued existence of NMFS ESA-listed species or to result in the destruction or adverse modification of designated critical habitat. Takes for the four endangered large whales species authorized in Permit No. 22156-04 fall within the scope of this programmatic BO. Therefore, authorizing take for paintball marking of two non-listed cetacean species for the proposed amendment to Dr. Nowacek does not change the determinations made for ESA-listed cetaceans for the current permit, Permit No. 22156-04. For this reason, impacts to ESA-listed species are not discussed further in this EA.

1.6.2.1 Designated Critical Habitat for ESA Listed Species

Dr. Nowacek's authorized area for the entire permit overlaps with designated critical habitat for North Atlantic right whales (*Eubalaena glacialis*), loggerhead sea turtles (*Caretta caretta*), and green sea turtles (*Chelonia mydas*). Only the critical habitat for loggerhead sea turtles (79 FR 39855) overlaps with the smaller areas of the Cape Hatteras Special Research Area (CHSRA) or 2) U.S. Navy's Jacksonville Shallow Water Training Range (JSWTR) where this pilot study would mainly occur. Specifically the area overlaps with migratory corridors and Sargassum habitat for loggerhead sea turtles. The temporary operation of a vessel when marking cetaceans is not expected to alter the identified essential features of these habitats, which include access to habitat, water chemistry, oceanographic conditions and structures, water circulation and temperature, live bottom habitat, and prey species. Further, because the vessel and use of any gear at the water surface is only temporary (i.e., not a permanent structure), the research activities would not prevent sea turtles from accessing marine habitat and nesting beaches. Dr. Nowacek's research methods are not expected to affect North Atlantic right whale or sea turtle prey species and no collection of these species is likely to occur. Therefore, impacts to critical habitat will not be discussed further in this document.

1.6.3 Animal Welfare Act

The Animal Welfare Act (AWA; 7 U.S.C. 2131 – 2156) sets forth standards and certification requirements for the humane handling, care, treatment, and transportation of mammals. Enforcement of these requirements for non-federal facilities is under jurisdiction of the U.S. Department of Agriculture's Animal and Plant Health Inspection Service. Each research facility is required to establish an Institutional Animal Care and Use Committee (IACUC) which reviews study areas and animal facilities for compliance with the AWA standards. The IACUC also reviews research protocols and provides written approvals for those that comply with AWA requirements. For federal research facilities, the head of the federal agency is responsible for ensuring compliance with the AWA requirements. It is the responsibility of the researcher to seek and secure IACUC reviews and approvals for their research.

1.7 Document Scope

NMFS prepared this EA in accordance with NEPA (42 USC 4321, et seq.) and CEQ Regulations (40 CFR 1500-1508). The analysis in this EA addresses potential direct, indirect, and cumulative impacts to short-finned pilot whales and bottlenose dolphins, resulting from NMFS' proposed action to authorize take associated with paintball marking these species. However, the scope of our analysis is limited to the decision for which we are responsible (i.e., whether or not to issue the scientific research permit amendment). Therefore, this EA provides focused information on primary impacts of environmental concern related to issuance of the scientific research permit amendment authorizing directed take of these two species for paintball marking and the mitigation and monitoring measures to minimize the effects of that take. For this reason, and by incorporating certain material by reference[9], NMFS does not provide a detailed evaluation of other marine mammals of which the Permit Holder is currently authorized directed take under his existing permit, or the evaluations of all the effects to the elements of the human environment listed in Table 1 because impacts to these elements are not anticipated from paintball marking.

Table 1. Components of the Human Environment Not Evaluated in this EA.

Biological	Physical	Socioeconomic/Cultural
● Amphibians ● Protected birds ● Humans ● Other authorized species under Permit No. 22156-04 within the North Atlantic Ocean ● Non-Indigenous Species	● Air Quality ● Critical Habitat ● Ecologically Critical Areas ● EFH ● Federal Marine Protected Areas ● Geography ● Land Use	● Commercial Fishing ● Historic and Cultural Resources ● Indigenous Cultural Resources ● Low Income Populations ● Military Activities ● Minority Populations ● National Historic Preservation Sites

[9] See 40 CFR 1501.12.

Table 1. Components of the Human Environment Not Evaluated in this EA.		
Biological	**Physical**	**Socioeconomic/Cultural**
	● National Estuarine Research Reserves ● National Marine Sanctuaries ● Oceanography ● Park Land ● Prime Farmlands ● State Marine Protected Areas ● Water Quality ● Wetlands ● Wild and Scenic Rivers	● National Trails and Nationwide Inventory of Rivers ● Recreational Fishing ● Shipping and Boating ● Public Health and Safety ● Equity and Environmental Justice

Chapter 2 Alternatives

2.0 Introduction

As indicated in Chapter 1, NMFS' proposed action is to issue a scientific research permit amendment to authorize directed take for the paintball marking of short-finned pilot whales and bottlenose dolphins associated with the applicants' proposed scientific research activities with additional mitigation and monitoring. NMFS' proposed action is triggered by Dr. Nowacek's request for a permit amendment per the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 et seq.). In addition to the proposed action, NMFS has included a No Action Alternative. While the No Action Alternative does not meet the purpose and need, it provides a baseline to which the proposed action is compared.

The evaluation of alternatives under NEPA assists NMFS with assessing alternative ways to achieve the purpose and need for its proposed action that may result in less environmental harm. To warrant detailed evaluation under NEPA, an alternative must be reasonable along with meeting the stated purpose and need for the proposed action. For the purposes of this EA, an alternative would only meet the purpose and need if it satisfies the requirements under Section 104 of the MMPA for marine mammals. Therefore, NMFS applied the following screening criteria to identify which alternatives to carry forward for analysis. Accordingly, an alternative must meet this criteria to be considered "reasonable."

- The action is consistent with the goals and requirements of the MMPA, including that the proposed research activities:
    - Are humane and will not result in unnecessary risks to the health or welfare of the animals;
    - Will be conducted for *bona fide* and necessary purposes; and

    - Will not likely have significant adverse effects on the affected species or stock or on any other component of the marine ecosystem of which the affected species or stock is a part.
- The action must not violate any federal laws or regulations.

2.1 Description of Proposed Research Activities

Permit No. 22156-04 authorizes researchers to take cetaceans when conducting acoustic playback trials in the presence of animals and vessel and aerial-based surveys for counts; passive acoustic recordings; observations; photo-identification and photography; collecting biological samples (exhaled air, skin and blubber biopsies, and sloughed skin); tagging (by suction-cup or invasive dart/barb) animals, with some species receiving two tags at a time; and tracking. The current permit also authorizes unintentional harassment of non-target non ESA-listed cetaceans in the vicinity of research. Biological samples collected in international waters may be imported into the United States and cell lines may be developed from tissue samples. This amendment would allow researchers to temporarily mark short-finned pilot whales and bottlenose dolphins with paintballs, as a pilot study to investigate how social marine mammals coordinate dive patterns by identifying individuals within the group in real time at the surface and underwater. This method has the potential to 1) answer previously unanswered questions about cetacean behavior, foraging ecology, and social structure; 2) supplement data processing of existing methods; and 3) provide an alternative method to track and monitor animals that is less invasive than existing dart tagging methods. Specifically, paintball marking would be conducted in conjunction with other methods such that a group of animals would be approached by vessel, counted, observed, photo-identified, biopsy sampled, have sloughed skin collected from the water, suction-cup tagged or marked by paintball, and then followed by UAS for observations and data collection. Researchers would not suction-cup tag and paintball mark the same animal on the same day.

Take for paintball marking as a research methodology has been previously authorized and conducted for pinniped species. However, for cetacean research, it is a relatively uncommon method that has only been authorized for cetaceans for two NMFS Permit Holders: 1) NMFS Marine Mammal Health and Stranding Response Program (MMHSRP) under Permit Nos. 18786-06 and subsequently Permit No. 24359, to identify individuals as part of stranding response, monitoring, and research and 2) Peter Tyack, Ph.D., under Permit No. 14241-03 to visually track animals. In each case, only non-toxic paints were proposed and authorized for take. Although the paintball marking method has been authorized for taking cetaceans, NMFS is not aware of any cases where the holders have performed this procedure on cetaceans (i.e., to date, permit holders have not reported using this method on cetaceans). No other research activities are proposed to be added to the permit as part of this amendment. Pending the results of this work, Dr. Nowacek may seek a future amendment to the permit to expand the use of this method to other cetacean species authorized by the permit.

2.1.1 Research Activity and Methods

The following section describes the proposed paintball marking method in detail. Activities that would occur in conjunction with the paintball marking include the following procedures:

- Vessel and UAS surveys for counts, passive acoustic recordings, photo-identification, observations, and collection of sloughed skin;

- Exhaled air sampling by UAS; and
- Biopsy sampling.

Each of these associated methods are described in full detail within the original permit application, File No. 22156, within the administrative record. This record, including subsequent amendments to the permit, is publicly available via NMFS' online database at: https://apps.nmfs.noaa.gov. These methods would occur in the same manner as currently described in the application and authorized under Dr. Nowacek's permit.

Paintball Marking

Researchers would conduct vessel surveys as currently authorized under Permit No. 22156-04. Once a group of target bottlenose dolphins or short-finned pilot whales is sighted, researchers would observe the group as candidates for tagging, sampling, and marking activities. They would deploy a suction-cup digital archival tag (DTAG) to an individual within the focal group either prior to or after marking others within the group by paintball. During this initial encounter for marking, no other activities with the focal group would occur except suction-cup tagging, which would occur only on animals not paintball marked. Animals of interest, identified by observation of behavior, would be marked by paintball. A biopsy sample may be obtained from animals that are marked to determine sex, evaluate metabolism and endocrinology, or conduct genetic analyses to inform population structure. Then researchers would conduct UAS flights to observe tagged and marked animals within the group at the currently authorized minimum altitudes of 30 meters (m) for species identification and 15 m for photogrammetry on the same day. The vessel would conduct a focal follow during the flights at a distance greater than 50 m from the target animals to minimize any further disturbance to the group. The encounter time with a group to mark animals is expected to be similar to that of encounters for biopsy sampling, approximately 30-60 minutes. If researchers are also biopsy sampling animals within the group, the encounter time could be slightly longer (within minutes) overall.

Only highly trained and experienced personnel who have extensive experience biopsy sampling and tagging cetaceans would be authorized take to mark animals. Both toxic and non-toxic paints are considered for this action. The example paints proposed by the applicant are 1) Nelson Pellet-Mark Oil-Base Marking Pellets™ (Nelson Paint Company, Kingsford, MI) housed in gelatin capsules, and 2) all-weather Paintstik Livestock Marker™ (LA-CO Industries, Inc. Elk Grove Village, IL) silicon dioxide housed in plastic shells to mark animals. For the purposes of this analysis, toxic paints are considered those that include substances classified as toxic on its safety data sheet. The scope of toxic paints considered for use for the proposed action is limited to paints determined for marine mammals to be comparable or less toxic than the Nelson paint analyzed in this EA. Markings would be applied using standard 0.68 caliber (17.3 mm diameter) paintballs and discharged within 4-30 m of the animal at a maximum velocity of 86.9 m/s. This is a similar velocity to other established cetacean biopsy sampling methods. When marking animals, researchers would target the lateral surfaces of adults below the dorsal fin. Researchers would avoid marking sensitive groups and age classes. Juveniles, calves, and females with calves would not be marked. Nor would researchers mark individuals exhibiting abnormal behavior or that are obviously injured or have open cuts, wounds or sores. Only apparently healthy adult individuals would be marked. When using the Paintstik paintballs, researchers would collect the plastic pellet shells with a plankton net from the water upon marking animals.

Up to 50 animals would be marked annually per species. No more than five individuals would be marked per group. Although researchers expect to apply only one to two marks per individual per encounter, up to five marks could be applied to a single individual animal per day, to ensure the paint adheres for the 4-5 hour duration of the day's experiment; this could occur if the first one or two paintballs do not properly burst or if the paint adheres for less time than expected and researchers need to approach the group a second time for additional markings. Multiple marks per individual helps to increase visibility of marking by increasing surface area, making it easier to re-sight from a safe following distance while meeting project objectives. In addition, available colors for paintballs are limited, and color choices are limited further by what is pragmatic for visibility in the field (blues and purples are less visible in the open ocean environment), essentially leaving orange and red as applicable paintball colors. Therefore, researchers may use multiple marks – a mix and match of both number of marks and color – to readily distinguish multiple marked individuals within the same group.

2.2 Alternative 1 – Issuance of Scientific Research Permit Amendment Authorizing Both Toxic and Non-toxic Paints As Requested

Under this alternative, NMFS would issue a permit amendment to Dr. Nowacek as requested, to temporarily paintball mark two cetacean species using either or both of the requested toxic (i.e., Nelson oil-based) or non-toxic (i.e., Paintstik) paints. The permit amendment would authorize paintball marking as another manner of take by Level A harassment for short-finned pilot whales and bottlenose dolphins, with additional mitigation requirements and restrictions.

Mitigation measures for methods that may result in Level A harassment, such as biopsy sampling and tagging, would be updated in the permit to include additional requirements for paintball marking. All permits, including Permit No. 22156-04, have mandatory requirements for the Permit Holders to achieve the MMPA standard of affecting the least practicable impact on the species. This includes a condition requiring Permit Holders to coordinate their activities with the NMFS Regional Offices and other Permit Holders conducting research on the same species in the same areas to avoid unnecessary duplication of research and disturbance of animals.

The annual number of authorized takes for these species would not change; rather, the take table in the permit would specify that only a subset of 50 adults of each species would be authorized for marking and the associated research methods described above in Section 2.1.1. Takes and mitigation measures for other species and activities covered in Dr. Nowacek's permit would remain unchanged and in effect.

2.2.1 Proposed Mitigation Measures for Alternative 1

Under Alternative 1, the amended permit would continue to require the standard mitigation in the research permit, which includes the following measures relevant to the proposed marking:

- Only allowing qualified personnel with experience to conduct the activities;
- Discontinuing activities if they interfere with vital functions or mom-calf pair bonding;
- Using protocols to minimize disturbance (e.g., approaching gradually from behind or alongside, rather than head on; approaching at slow speeds; minimizing amount of time spent in close proximity to animals; modifying vessel parameters such as distance or speed to minimize disturbance); and

- Using sterile biopsy sampling tips and invasive tagging equipment.

In addition, the following mitigation measures would be added specifically for paintball marking:

- Limiting attempts to mark an animal to no more than five attempts per day with individual animals marked up to three times (on different days) per year.
- Discontinuing an attempt to mark if an animal exhibits repetitive, strong, adverse reactions to the activity or vessel;
- Prohibiting marking of animals that appear in poor health, compromised, or that have open wounds, sores, cuts, etc.;
- Prohibiting attempts to mark animals in sensitive areas (anywhere forward [cranial] of the pectoral fin);
- Prohibiting marking of calves, juveniles, and mom-calf pairs; and
- Requiring follow-up monitoring of marked animals.

2.2.2. Proposed Monitoring and Reporting for Alternative 1

As required in Permit No. 22156-04, Dr. Nowacek must submit an annual report at the end of each permit year describing the activities conducted under the permit. These reports allow NMFS to assess beneficial and adverse impacts of authorized take associated with the research activities and to develop or further refine best management practices. All current monitoring and reporting requirements for this permit would remain in effect. For this amendment, NMFS would include an additional requirement for Dr. Nowacek to temporarily cease marking activities and report on his progress and the efficacy of the marking method after marking 10 animals per species with either paint type, and discuss any observed effects and problems he encountered. Review after marking 10 animals would be required when applying either paint type and researchers must know which paint type is used to mark each animal. Based on review of that information, the Permits Division would determine whether marking activities may resume and whether any additional mitigation or monitoring measures are required. Further, Dr. Nowacek would be required to monitor animals opportunistically over time and provide information on any subsequent resightings of marked animals in his annual reports. Researchers are also required to notify the appropriate NMFS Regional Office of planned activities so these offices can coordinate field activities and monitor take for species among all Permit Holders working in their respective region.

2.3 Alternative 2 – Issuance of Scientific Research Permit Amendment with Limited Authorization of Nelson Paintballs (*Preferred Alternative*)

Under this alternative, NMFS would issue a permit amendment to Dr. Nowacek, with a temporary authorization to paintball mark two cetacean species using the Nelson paintballs in a limited manner, and a non-toxic paintball if a new delivery mechanism is approved (see adaptive management further below). In contrast to Alternative 1, this alternative would require Dr. Nowacek to 1) initially test the requested Nelson Pellet-Mark Oil-Base Marking Pellets on no more than 10 animals in the wild and provide documentation that the Nelson paintballs are effective in meeting the objectives and do not cause severe, adverse behavioral or skin reactions. If photographic or video documentation is not sufficient to assess the impacts to the cetaceans' skin after 10 successful deployments on cetaceans in the wild, then Dr. Nowacek would be required to either a) work with inshore cetacean researchers with local, well-studied

populations (e.g., in Charleston, South Carolina; or Sarasota, Florida.) that allow for multiple-day follow-up sightings of a few individuals after pellet deployment; b) work with local or regional stranding networks to use the paint on live, stranded cetaceans prior to euthanasia to evaluate skin for any acute contact dermatitis (up to an hour); or c) work with captive facilities to test the paint on animals for longer follow-up periods (up to a few days). Dr. Nowacek would be required to report on their progress on the first deployment on 10 animals to the Permits Division before this paint or any other paints would be authorized to mark additional animals of the target species in the wild (see the monitoring section below for more details). As in Alternative 1, if additional marking is authorized, a subset of 50 animals each of bottlenose dolphins and short-finned pilot whales may be authorized for marking takes and the above-described associated research activities.

2.3.1 Proposed Mitigation Measures for Alternative 2

This alternative would add the following requirements for paintball marking to the permit:

- Only allowing the Nelson paint option at the time of issuance but providing a framework for future authorization of a non-toxic or other paint;
- Limiting attempts to mark an animal to no more than five attempts per day;
- Marking 10 individual animals only once each during the initial marking period before reporting to the Permits Division;
- Discontinuing an attempt to mark if an animal exhibits repetitive, strong, adverse reactions to the activity or vessel or if marks break the skin or cause a severe, adverse skin reaction;
- Prohibiting marking of animals that appear in poor health, compromised, or that have open wounds, sores, cuts, etc.;
- Prohibiting marking of animals in sensitive areas of the body (anywhere forward [cranial] of the pectoral fin) or in the vicinity of a biopsy wound;
- Prohibiting marking of calves, juveniles, and mom-calf pairs;
- Stopping marking activities after 10 wild animals are marked and reporting on their progress to the Permits Division;
- Conducting additional deployments on inshore cetaceans, live stranded cetaceans, or captive animals that can be more closely monitored if sufficient information on the impacts of the Nelson paint is not obtained for NMFS to evaluate the impacts after initially marking 10 animals in the wild; and
- Requiring follow-up monitoring of marked animals over the course of each year.

2.3.2. Proposed Monitoring, Reporting, and Adaptive Management for Alternative 2

Proposed monitoring and reporting for this alternative would be similar to that described in Alternative 1. Briefly, all existing permit requirements would remain in effect and new requirements would be added to monitor the efficacy and potential impacts of the marking method through the researchers' field efforts; if additional data is needed, the results of testing the paint on inshore cetaceans or live captive or stranded cetaceans. This includes temporarily halting marking activities after 10 animals have been marked and reporting on those efforts to the Permits Division. The Permits Division would implement an adaptive management plan to provide a framework to determine whether to authorize further marking of animals with the Nelson paint and/or other paint options to mark animals should the applicant request to use

another type of paint. These options may include non-toxic paint, such as commercially available non-toxic paintballs used for human sport, or other toxic paints. As described earlier in this chapter, the scope of toxic paints that could be considered for future use is limited to paints determined for marine mammals to be comparable or less toxic than the Nelson paint analyzed in this EA. The adaptive management framework may involve an evaluation of the efficacy of the proposed paint to successfully mark animals and its potential impacts to marine mammals. This evaluation may include:

- Approval of the proposed paint for marking from the applicant's IACUC;
- Review and calculation of the potential toxicity of the proposed paint based on its safety data sheet;
- Testing of the proposed paint using the proposed marking method (e.g., paintball gun) on a small cetacean carcass or section of skin and blubber tissue held in seawater;
- Testing of the proposed marking method and paint on inshore cetaceans, testing on live stranded cetaceans after a determination has been made that euthanasia is warranted, or testing on captive cetaceans held in a facility;
- Review by NMFS' marine mammal veterinary officer for animal welfare and humaneness; and
- Review of any additional mitigation and reporting measures (e.g., requiring the holder to report on efficacy after marking animals with toxic paint) needed to minimize impacts to animals.

The Permits Division would consider the above types of information and the efficacy of the testing on carcasses and/or live animals, including any observed physical or behavioral responses of live animals, in determining whether the paint would be approved for use.

2.4 Alternative 3 – No Action

For NMFS, denial of the permit amendment request constitutes the NMFS No Action Alternative, which is consistent with its statutory obligation under the MMPA to grant or deny permit requests and to prescribe mitigation, monitoring, reporting and other conditions, as applicable with any permits. In this case, the applicant's existing permit would remain in effect but the permit would not authorize take for paintball marking.

Although the No Action Alternative would not meet NMFS' purpose and need to allow takes of these species and would result in a loss of valuable data for these species, CEQ's regulations require consideration and analysis of a No Action Alternative for the purposes of presenting a comparative analysis to the action alternatives.

Chapter 3 Affected Environment

3.0 Introduction

NMFS reviewed all possible affected environmental, cultural, historical, social, and economic resources based on the geographic location associated with NMFS' proposed action and alternatives, and the applicant's request to amend his existing permit to authorize take for marking of short-finned pilot whales and bottlenose dolphins during scientific research activities. Based on this review, this Chapter describes the affected environment and existing (baseline)

conditions for select resource categories (e.g., marine environment). As explained in Chapter 1, certain resource categories were not carried forward for further consideration or evaluation in this EA (See Section 1.7) and where appropriate, the analysis in relevant EAs related to baseline conditions and select resource categories is incorporated by reference. Other biological resources that are herein incorporated by reference include descriptions of other cetacean species that are the subject of Dr. Nowacek's current permit; descriptions of each species can be found in NMFS' marine mammal stock assessments available at: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-species-stock and for ESA species, the programmatic BO prepared for the cetacean permitting program (NMFS 2019). These documents summarize the life history of each species. Chapter 4 provides an analysis and description of environmental impacts associated with the affected environment.

3.1 Physical Environment

The physical environment in which permitted scientific research activities occur is the marine environment and the surrounding airspace (when aerial surveys are conducted). Dr. Nowacek's studies encompass the U.S. EEZ and international waters from Maine to Florida in the Northwest Atlantic Ocean, as well as international waters offshore of the Caribbean and Canada. For this amendment, paintball marking of short-finned pilot whales and bottlenose dolphins is expected to occur mainly as a pilot study in the CHSRA offshore of North Carolina or the JSWTR offshore of Florida. The CHSRA is a relatively small area approximately 50 miles offshore of Cape Hatteras, North Carolina along the Atlantic's continental shelf break. JSWTR is a 1,700 kilometer^2 naval training area that overlaps the continental shelf break offshore of Jacksonville, Florida. It would not take place within or near a National Marine Sanctuary or Marine Monument, wildlife refuge, National Park, or other conservation area and would not involve other interactions with physical features of ocean and coastal habitat. Future marking efforts on other cetacean species could occur in the rest of Dr. Nowacek's permitted study area pending the results of this work.

3.2 Biological Environment

Thirty cetacean species under NMFS' jurisdiction are authorized for take in Dr. Nowacek's permit, with confirmed or possible occurrence in the entire research area of the Northwest Atlantic. A complete description of each species and its status under the MMPA and ESA can be found in NMFS' marine mammal stock assessments. This EA focuses on the two target species that are the subject of the amendment: bottlenose dolphins and short-finned pilot whales.

3.2.1 Target Species

The primary components of the biological environment that would be impacted by the permit amendment are short-finned pilot whales and bottlenose dolphins that would be directly impacted by the authorization of takes for paintball marking.

Bottlenose dolphin

Common bottlenose dolphins have a gray body with a light gray or white belly and short, thick rostrum. They may travel alone or in groups, and the groups often break apart and reform. They are social animals and feed on a variety of prey. The bottlenose dolphin is a cosmopolitan

species found in temperate and tropical coastal and offshore waters around the world. NMFS' stock assessment report (SAR) recognizes 17 stocks within Dr. Nowacek's authorized study area and all but one are considered strategic[10] under the MMPA (Hayes et al. 2023). For this amendment, marked dolphins would most likely be part of the Western North Atlantic Offshore stock which is not strategic. Due to some seasonal spatial overlap of stocks, target animals also could be from the Northern or Southern Migratory Coastal stocks or the Western North Atlantic Northern Florida Coastal stock, all of which are considered strategic. Based on the most recent SAR data available, the Western North Atlantic Offshore stock has approximately 62,000 dolphins with a potential biological removal (PBR) of 519 animals; no population trend has been estimated for this stock. The Northern Migratory Coastal stock is estimated to have 6,000 dolphins with a PBR of 48 animals. The Southern Migratory Coastal stock is estimated to include over 3,000 dolphins with a PBR of 24 dolphins. The Western North Atlantic Northern Florida Coastal stock is estimated to have 877 dolphins with a PBR of 6 dolphins. Population trends are not available for these stocks.

Short-finned pilot whale

The short-finned pilot whale is a small whale species with a bulbous melon head with no obvious rostrum. It has a black or dark brown body, with a large gray saddle behind the dorsal fin. Short-finned pilot whales are highly social, living in groups of 30 to 50 animals and tend to live in localized, resident populations. They are deep divers that forage on squid, fish, and octopus. This species is found throughout the world in tropical and temperate regions with three stocks recognized in U.S. Atlantic waters. The Western North Atlantic stock, the subject of Dr. Nowacek's amendment request, is found along the U.S. East Coast mainly over the continental shelf. The population is estimated to have over 28,000 whales but no population trend is available (Hayes et al., 2023). It has a PBR of 236 whales and is not considered strategic or depleted under the MMPA.

Chapter 4 Environmental Consequences

4.0 Introduction

NMFS reviewed all possible direct, indirect, cumulative, short-term, and long-term impacts to protected species and their environment associated with NMFS' proposed action and alternatives. Based on this review, this section describes the potential environmental consequences for the affected resources described in Chapter 3. In the following impacts assessment, all effects described in this chapter are direct and adverse unless specified as indirect or beneficial.

[10] Under the MMPA, the term "strategic stock" means a marine mammal stock (A) for which the level of direct human-caused mortality exceeds the potential biological removal level; (B) which, based on the best available scientific information, is declining and is likely to be listed as a threatened species under the Endangered Species Act (ESA) within the foreseeable future; or (C) which is listed as a threatened or endangered species under the ESA, or is designated as depleted under the MMPA.

4.1 Approach for Assessing Impacts

NMFS assessed the potential of Dr. Nowacek's research methods to result in "take," and whether collectively, the take from conducting the research could result in population or species level effects. To characterize the nature and severity of impacts resulting from "take" as evaluated in this EA:

- NMFS considers minor impacts as those that result in no more than disturbance or very low risk of injury
- Moderate impacts are those that may result in minor injury or superficial harm to the target animal with animals recovering and healing
- Major impacts are those that could pose a risk of serious injury or death to the animal

NMFS evaluates the duration of impacts in this EA as follows:

- Short-term impacts are those from which animals can recover in the course of the day (minutes to hours) or within days to weeks of the event. All impacts described below in this section are expected to be short term.
- Long-term impacts are those lasting more than several months to approximately a year or permanently

As described in Chapter 2, research activities involving the target animals include vessel surveys and manual tracking, UAS operation, passive acoustic recordings, photo-identification, behavioral observations, biological sampling (skin and blubber biopsy, sloughed skin, and exhaled air) and paintball marking. However, only impacts to short-finned pilot whales and bottlenose dolphins resulting from the proposed paintball marking is included in this analysis. Paintball marking would only occur during vessel surveys as part of research activities already analyzed for the current permit. All of the remaining activities have been identified in the CE for Dr. Nowacek's current permit, No. 22156-04. These other activities have also been analyzed in previous EAs[11] for numerous cetacean species; these include the MMHSRP EA and Programmatic Environmental Impact Statement (PEIS) prepared for Permit No. 18786 (NMFS 2015) and Permit No. 24359 (NMFS 2022). Specifically, these previous analyses presented the baseline environmental conditions, potential impacts to marine mammals, and addressed the following key concerns related to marine mammal impacts from conducting research:

- Impacts of vessel and aerial surveys on cetaceans indicating these research activities may result in short-term minor disruptions in behavioral patterns and that these disruptions are not life threatening or otherwise biologically significant to the individual, stock, population, or species.

[11] Since 2005, NMFS has prepared over 100 EAs for issuance of permits for direct take under the MMPA and ESA. In every case, the EA supported a finding of no significant impact regardless of the nature of the permitted take or the status of the species that were the subject of the permit. The Biological Opinions associated with these EAs and permits further support the finding that issuance of research permits are not likely to adversely affect listed species. Furthermore, based on the review of monitoring reports submitted by permit holders, there is no evidence to date that the effects of permit issuance for take of marine mammals listed under the ESA results in adverse effects on stocks or species. All permits for research on marine mammals require submission of annual reports, which include information on responses of animals from the various research activities and methods that result in intentional take.

- Impacts of biopsy sampling cetaceans indicating these research activities may result in short-term minor disruptions in behavioral patterns and that these disruptions are not life threatening or otherwise biologically significant to the individual, stock, population, or species.

For the proposed action to have an adverse effect on a species, the exposure of individual animals to the research activities would have to 1) cause death or a serious injury that would lead to death or 2) disrupt essential behaviors (feeding, mating or nursing) to a degree that the individual's likelihood of successful reproduction or survival was substantially reduced.

4.2 Effects of Alternative 1 – Issuance of Scientific Research Permit Amendment for Both Toxic and Non-toxic Paint as Requested

4.2.1 Impacts to Target Species from Alternative 1

OPR expects that Dr. Nowacek's research activities have the potential to take short-finned pilot whales and bottlenose dolphins as defined by the MMPA. The issue not already analyzed is the potential for adverse impacts on these target species from paintball marking.

It is important to recognize that an adverse effect on a single individual or a small group of animals does not translate into an adverse effect on the population or species unless it results in reduced reproduction or survival of the individual(s) that causes an appreciable reduction in the likelihood of survival or recovery for the species.

Impacts from Paintball Marking

Physical Impacts

The application of paintballs in terrestrial mark-recapture studies has had marked success, particularly with Nelson oil-based paintballs (e.g. Pauley and Crenshaw 2006), but to OPR's knowledge, has not been applied to cetacean research. While considered safe for human recreational use, paintballs may cause contusions (bruising) in humans. Similarly, marking could result in bruising which may take days to heal of targeted animals. The maximum velocity of marking animals proposed by Dr. Nowacek is a typical and standardized safe operating velocity for human recreational use of paintballs (Conn et al. 2007). Other established cetacean biopsy sampling methods use similar velocities. For example, many popular crossbows used for biopsy collection of cetacean species have similar safe firing velocities (e.g., Barnett Panzer ~84m/s; Sinclair et al. 2015). Because paintball marks do not break human skin at these specifications, we do not expect marks to break the skin of targeted bottlenose dolphins and short-finned pilot whales, given that the adults of the target species have substantially thicker skin and blubber layers (approximately 2 centimeters or greater) than humans (Bagge et al. 2012; Noren and Wells 2009; Struntz et al. 2004). Any bruising would be expected to heal within days. Further, paintball marking is expected to be less invasive than biopsy sampling and dart tagging, which are authorized in Dr. Nowacek's permit and commonly employed in cetacean research. Researchers can further limit the impulse, or impact force, to target animals by decreasing muzzle velocity and increasing distance to the target individual.

Based on laboratory-based testing by Dr. Nowacek's research team, using tissue from a dolphin carcass, paintball marks using either source of paint are expected to remain on animals for a

minimum of 2 hours and up to 2 weeks. Marks are expected to wear off over time due to wave and water movement over the skin, and would likely depend on environmental conditions (e.g., temperature, sea state, etc.). Further, Dr. Nowacek's team observed that the marks were removed or worn off often within 24 hours. This demonstrates that the proposed marking has the potential to provide substantial utility to meet research objectives while remaining temporary.

OPR does not expect that markings would increase an animal's risk of predation or interfere with vital functions. Red and orange light, which are also preferred paintball colors due to their high visibility, attenuate rapidly with depth. This means these colors are not visible at depth, preventing any interference with foraging or increased predation risk. In addition, red- and orange-colored marks would not hinder predator avoidance strategies that entail diving below the photic zone. Repeated exposure of paint marks to increased depth and low temperatures may reduce the integrity of the paint over time, assisting in the removal of these temporary marks.

Toxicity

One consideration for the use of paint as a marking method is toxicity to animals, either target or non-target conspecifics. After reviewing the literature, to OPR's knowledge, the application of paintballs to cetaceans in the wild has not been attempted. However, the MMHSRP commonly marks stranded cetaceans and pinnipeds with non-toxic paint sticks; in its final PEIS, the MMHSRP noted this method would have "minimal and temporary impacts to marine mammals" (NMFS 2022). In addition, temporary markings using commercial hair bleach, dyes, and paints have been routinely applied to other marine mammals, namely pinnipeds, for example the endangered Steller Sea Lion (*Eumetopias jubatus*), under NMFS research permits. Paint has not been identified as affecting survival of pups or adult pinnipeds and is considered by NOAA to be a "relatively low-risk procedure" (York 2005; NMFS 2007).

As described in Section 2.1.1, researchers may use two types of paintballs: 1) pre-manufactured oil-based Nelson marking paintballs, or 2) custom made paintballs filled with reconstituted all-weather non-toxic Paintstik paint in a plastic shell or pre-manufactured biodegradable gelatin shell. Paintstik's safety data sheets (LA-CO Industries Inc & Markal Co 2013) note the potential for skin irritation as well, but that the paint is non-toxic; this paint is routinely applied to commercial livestock and used in other marine research, including to mark stranded cetaceans (via the MMHSRP) and to mark the carapace of hard-shelled sea turtles authorized in NMFS ESA Section 10(a)(1)(A) research permits. Because the Paintstik Livestock Marker paint does not contain toxic ingredients, its potential for toxicity to animals is not evaluated further in this EA.

Safety data sheets for Nelson paintballs note the paint is considered a skin irritant; such irritation may result in skin color change (e.g.,redness), sloughing of skin, blistering, or, if severe, ulceration. However, acute toxicity parameters indicate it is only considered harmful when in contact with the skin in excess of 1,662.32 milligrams (mg)/kilogram (kg) body weight (The Nelson Paint Company 2015). At <2.81 grams (g) paint per paintball, researchers would have to apply more than 1,180 paintball marks at one time to a short-finned pilot whale (average mass ~1,996 kg [https://www.fisheries.noaa.gov/species/short-finned-pilot-whale, accessed November 18, 2022]), to induce an acute toxicological response via dermal exposure. Similarly, researchers would have to apply over 177 paintball marks to a bottlenose dolphin (average mass ~300 kg [https://www.acsonline.org/index.php?option=com_content&view=article&id=51:bottlenose-

dolphin&catid=20:site-content, accessed December 8, 2022]) to induce an acute toxicological response. Researchers anticipate applying 1-2 marks, but no more than five, per animal in 1 day. If all five marks are applied to an animal, that is 236 times and 35 times lower than the acute toxic dose for individual short-finned pilot whales and bottlenose dolphins, respectively.

OPR also considered the potential risks for animals exposed to the Nelson oil-based paint by inhalation, ingestion, or entry into the skin or eyes, and have determined these risks to be negligible. Ingestion and inhalation risk is expected to be minimal by the inherent nature of marking an animal's flank, well behind the blowhole. In addition, as a mitigation measure of the proposed permit amendment, researchers would be required to avoid marking animals in sensitive areas and limit the number of marks per animal in a given day. Dr. Nowacek's laboratory tests using preserved dolphin skin specimens indicated that non-target splatter of paint on the tissue marked was minimal. Thus, ingestion and exposure to eyes via seawater by target or non-target animals seems highly unlikely. Oral acute toxicity of Nelson paintballs is ~570 mg/kg. Even if curious conspecific animals were able to remove paint from marked individuals and ingest the paint, an adult pilot whale and bottlenose dolphin would have to ingest over 400 and 60 paintball's worth of paint, respectively, to elicit a toxicological response. NMFS expects this is highly unlikely to occur. Therefore, NMFS has determined that the proposed Nelson oil-based paint does not pose an acute toxicity risk to cetaceans as prescribed. Similarly, NMFS expects it is highly unlikely that animals would ingest plastic pieces from the shattered paintballs when marked. Moreover, the applicant's proposed paintball marking protocol has been approved for use by his IACUC; this supports NMFS' determination under the MMPA that the activities are humane.

Behavioral Impacts

In terms of behavioral responses, while this marking method has not yet been used for cetaceans, NMFS can draw from information where it has been used in pinniped research. NMFS has authorized take by paintball marking of pinnipeds since 2009 for the NMFS Alaska Fisheries Science Center (AKFSC). The AKFSC has marked California sea lions (*Zalophus californianus*) and noted in their annual reports for Permit No. 782-1812-01 that the mark may cause temporary pain and that the animals either do not react or slightly flinch when the paintball hits, but they immediately return to the prior behavior they were engaged in before marking (NMFS 2009; 2010). In addition, the MMHSRP described this as a temporary marking method with the potential to stun a pinniped and cause momentary stress and a startle reaction in its final PEIS (NMFS 2022). The draft EA (NMFS 2020) prepared for the proposed guidelines for deterring marine mammals also evaluated the use of paintballs to serve as projectile deterrents for pinnipeds. That EA noted that all types of projectiles proposed have the potential to result in contusions (e.g., bruises) upon impact with localized trauma to the underlying surrounding tissues. Overall, NMFS expects the responses of target dolphins and pilot whales to the proposed marking method to be comparable to these assessments, while recognizing that reactions may vary among animals, including those receiving up to five marks. Further, given that the velocity setting of the paintball gun (and thus of the paintballs) used to mark animals would be comparable to the velocity used for Dr. Nowacek's biopsy sampling of cetaceans, NMFS expects animals' reactions to paintball marking to be less than or comparable to the behavioral responses observed from biopsy sampling. As described in prior EAs analyzing the impacts of biopsy sampling cetaceans for research, responses can include no reaction, a startle or flinch movement, tail flicks, submerging below the water surface, or some combination of these

responses (NMFS 2004; 2005a, b). Animals would be expected to resume their previous behaviors as soon as the marking event ends. These EAs also have demonstrated that when conducted properly, biopsy sampling has no lasting effect on cetacean populations. In addition, conspecific animals within the group targeted for marking or other cetacean species that could be in the vicinity of research may be indirectly impacted by being unintentionally harassed from the presence of the vessel. Signs of harassment are expected to be similar to or less than the reactions identified above for target animals; responses may include but are not limited to no reaction, a startle or flinch movement, submerging below the water surface, or some combination of these responses. Dr. Nowacek's permit currently covers take for such harassment should it occur.

Conclusion

As previously analyzed for Dr. Nowacek's current permit, the impacts of his research methods to individual animals may include brief disturbance or injury (mainly from invasive biopsy sampling and dart tagging procedures). Paintball marking would occur in conjunction with a subset of these activities as described in Section 2.1 during vessel-based surveys. NMFS does not expect paintball marking when combined with other permitted research activities, including biopsy sampling, to result in significant adverse impacts to individual animals or the populations or species that are the subject of this permit amendment.

Based on this information, NMFS concludes that paintball markings may result in minor to moderate, impacts, mainly disturbance and possible bruising, which are not significant to target short-finned pilot whales and bottlenose dolphins. Therefore, NMFS also does not expect paintball marking to result in mortality or serious injury of any cetaceans.

NMFS also does not expect this methodology to result in long-term impacts or reduction in fecundity or impacts to populations, stocks, or the species as a whole, for bottlenose dolphins or short-finned pilot whales because neither death nor reduction of an individual's likelihood of reproduction or survival would occur. For this reason, paintball marking as proposed is not expected to lead to population or species level effects.

4.2.2 Proposed Marine Mammal Take for Alternative 1

Under Alternative 1, Dr. Nowacek's permit would be amended to add paintball marking to a portion of the current number of short-finned pilot whales and bottlenose dolphins that he is authorized to take annually. Dr. Nowacek's permit authorizes the annual take of 400 bottlenose dolphins and 200 short-finned pilot whales. The proposed amendment would allow him to paintball mark up to 50 animals of each species annually for this pilot study.

The prescribed measures to protect and minimize impacts on marine mammals from directed take through the proposed permit amendment, are expected to lessen the impacts of these activities on these species. NMFS does not expect population or species level impacts because the animals would recover quickly within days of the encounter. In addition, standard research coordination measures that will remain in the permit will prevent multiple Permit Holders from targeting the same individuals on the same day. In addition, the standard research coordination measures to notify the NMFS Regional Office in advance of the field season and coordinate with other Permit Holders individually would apply.

4.3 Effects of Alternative 2 – Issuance of Scientific Research Permit Amendment with Limited Authorization of Nelson Paintballs (*Preferred Alternative*)

4.3.1 Impacts to Target Species from Alternative 2

The impacts of the Preferred Alternative to the target species are expected to be comparable to or less than those described in Alternative 1. Animals may exhibit a short-term disturbance and the marking may result in bruising and/or skin irritation. Because the applicant would only be allowed to use paints considered in Section 2.1.1, the impacts of this alternative are expected to be comparable to or less than those identified in Alternative 1.

NMFS concludes that paintball markings may result in minor to moderate, direct adverse impacts, mainly disturbance and possible bruising or skin irritation, which are not significant to target short-finned pilot whales and bottlenose dolphins. Therefore, NMFS also does not expect paintball marking to result in mortality or serious injury of any cetaceans.

NMFS also does not expect this methodology to result in long-term impacts or reduction in fecundity or impacts to populations, stocks, or the species as a whole, for bottlenose dolphins or short-finned pilot whales because neither death nor reduction of an individual's likelihood of reproduction or survival would occur. For this reason, paintball marking as proposed is not expected to lead to population or species level effects.

4.3.2 Proposed Marine Mammal Take under the MMPA for Alternative 2

Under the Preferred Alternative, the proposed take numbers for paintball marking of short-finned pilot whales and bottlenose dolphins would be identical to those described for Alternative 1 in Section 4.2.2. All existing permit measures in Permit No. 22156-04 would remain in effect as described in Section 2.2.2. This alternative would include additional mitigation measures for paintball marking beyond those described in Alternative 1 to minimize impacts and closely monitor marked animals, including an initial requirement that Dr. Nowacek could only use the Nelson oil-based paint option to mark animals. Dr. Nowacek would be required to seek approval to use any other paint to mark animals after having marked 10 animals. If another type of paintball is authorized for use, NMFS would accordingly update the permit requirement on the paint type that is authorized for use. The adaptive management framework also would require Dr. Nowacek to conduct further testing of the paint on other sources of cetaceans as described in Section 2.3.2 if the initial results of marking 10 animals in the wild are inconclusive or the paint marking is ineffective. NMFS may also require additional mitigation and/or monitoring measures deemed necessary to minimize impacts to the target species or other portions of the environment pending the evaluation of the paint described as part of the adaptive management plan.

4.4 Effects of Alternative 3 - No Action Alternative

Under the No Action Alternative, NMFS would not issue the proposed permit amendment to paintball mark short-finned pilot whales and bottlenose dolphins. Researchers would continue to be authorized to take these animals as authorized in Dr. Nowacek's current permit. However, the

opportunity would be lost to better understand cetacean behavior, foraging ecology, and social structure in a non-invasive manner.

4.4.1 Impacts to Target Species from Alternative 3

The proposed marking method for short-finned pilot whales and bottlenose dolphins could not legally proceed without the permit amendment; therefore, there would be no additional direct or indirect effects to these species of not issuing the permit amendment. It is unlikely Dr. Nowacek would conduct the marking in the absence of a permit, because to do so would risk sanctions and enforcement actions. However, he would continue to conduct other research methods, including invasive biopsy sampling, authorized for take in the permit.

Not issuing the permit amendment would prevent Dr. Nowacek from achieving his research objectives that would aid conservation and management and further NMFS' understanding of these species. Dr. Nowacek could continue to conduct other authorized research activities that could serve as a means to track and monitor animals that may result in adverse impacts to the target animals. For instance, Permit No. 22156-04 authorizes take for suction-cup tagging and invasive dart tagging of both species. If Dr. Nowacek chose to dart tag animals as an alternative means to track animals, this would result in a greater impact than the proposed paintball marking method to the target animals. Dart tagging, therefore, would result in a moderate, short-term impact to bottlenose dolphins and short-finned pilot whales.

Not conducting the proposed marking would result in lost opportunities to gain valuable data on these species and this method's potential as a tool to inform NMFS' understanding of cetacean behavior. As described in Dr. Nowacek's amendment request, this method has the potential to 1) answer previously unanswered questions about cetacean behavior, foraging ecology, and social structure; 2) supplement data processing of existing methods; and 3) provide an alternative method to track and monitor animals that is less invasive than existing dart tagging methods. More specifically, Dr. Nowacek is interested in how social marine mammals coordinate dive patterns. This method also has the potential for researchers to gain insight into group stability across time and identify the individuals that initiate foraging dives.

4.5 Cumulative Effects

NEPA defines cumulative effects as "effects on the environment that result from the incremental effects of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions that take place over time." (40 CFR Part 1508.1(g)(3)7)

As discussed below, NMFS believes that the proposed action would not have a significant cumulative effect on either the physical, biological, or socioeconomic environments when combined with other past, present, and reasonably foreseeable future actions. The proposed action is directed at specific cetaceans and would not have a significant cumulative effect on non-target species or the physical environment in the proposed study area when combined with other past, present, and reasonably foreseeable future actions. Therefore, the following analysis of cumulative effects focuses solely on the target species where directed takes are requested in the proposed action. The following analysis provides a brief summary of the past, present, and

reasonably foreseeable future human-related activities affecting these specific target species in the study area.

4.5.1 Past, Present, or Future Research Activities

Marine mammals have been the subject of field studies for decades. Over time NMFS has issued numerous permits for the take of marine mammals, including short-finned pilot whales and bottlenose dolphins, by harassment from a variety of activities. These activities include aerial and vessel surveys, photo-identification, remote biopsy sampling, and tagging along the U.S. East Coast.

Currently, 26 active permits and Letters of Confirmation (LOCs) authorize take for directed research of the two target species along the U.S. East Coast (Appendix A, Table A2) in addition to the applicant's current permit. Only nine active permits authorize take for research methods, mainly biopsy sampling or tagging, which have the potential to result in injury and thus Level A harassment. The remaining 17 actions authorize take for activities that may only result in no more than Level B harassment. Ten of the 26 permits and LOCs have the potential to overlap with Dr. Nowacek's proposed work in the CHSRA offshore of North Carolina or JSWTR offshore of Florida. Six of these 10 actions authorize take for activities that have the potential to result in Level B harassment and Level A harassment. Given the number of permits, the associated takes, research vessels, and personnel present in the environment, repeated disturbance of individual whales and dolphins may occur in some instances. However, under the Preferred Alternative, as described in Section 2.2.1 and 2.2.2, disturbance would be limited through research coordination to avoid and minimize the potential for population-level effects through repeated harassment of individual animals from permitted research. NMFS would continue to monitor the effectiveness of these conditions and the management approach in avoiding unnecessary repeated disturbances.

NMFS expects that most researchers will request new permits, or renewals, to continue their work once the current permit expires, as illustrated in Table A2.

Dr. Nowacek's amendment would not increase the number of takes authorized for short-finned pilot whales or bottlenose dolphins in his permit. Beyond this, NMFS cannot predict with certainty, the level of take of each species that may be requested in the future by other applicants but, at a minimum, expects the amount of future research on these species to remain comparable to current levels as new avenues of study in marine conservation, biology, and management needs are identified.

Under the Preferred Alternative, as discussed in Section 4.2.1, NMFS does not expect serious injury or mortality to occur from the proposed paintball marking method, and serious injury or mortality would not be authorized. Further, Dr. Nowacek has reported no such incidents of mortality or serious injury from any of his permitted research methods under Permit No. 22156-04. Therefore, we do not expect the proposed paintball marking method, when performed in conjunction with Dr. Nowacek's other authorized research activities or any other permits and associated activities that could affect the same individuals and groups, to result in a significant adverse impact on short-finned pilot whales or bottlenose dolphins. In addition, because we cannot predict the efficacy of paintball marking as a research method, the cumulative impact of

the proposed paintball marking to the greater body of research occurring on cetaceans cannot be quantified or qualified at this time.

As described in Section 2.2, all permits issued by NMFS for research on protected species, including the issuance of this permit amendment to Dr. Nowacek, contain conditions requiring the Permit Holders to coordinate their activities with the NMFS Regional Offices and other Permit Holders conducting research on the same species in the same areas to avoid unnecessary duplication of research and disturbance of animals. NMFS acknowledges that repeated disturbance of some individual animals could occur. However, as described above in Section 4.2.1, NMFS expects that the effects of temporary Level B harassment of individuals would dissipate once the encounter ends, and therefore animals would recover before being targeted for research by another Permit Holder. NMFS would continue to monitor the effectiveness of the coordination requirements in its scientific research permits to avoid unnecessary repeated takes.

4.5.2 Climate Change

Global climate change could significantly affect marine resources in the Atlantic. Broadly, possible impacts include temperature and rainfall changes, rising sea levels, and changes to ocean conditions, such as ocean circulation patterns and storm frequency. These changes may affect marine ecosystems in the study area by increasing the vertical stratification of the water column, shifting prey distribution, impacting competition, and generally impacting species' ranges (Richardson and Schoeman 2004; Learmonth et al. 2006). Such modifications could cause ecosystem regime shifts as the productivity of the regional ecosystem undergoes various changes related to nutrients input and coastal ocean process (Doney et al. 2012).

However, the precise effects of global climate change on the study area cannot be predicted at this time because the marine ecosystem is highly variable in its spatial and temporal scales.

4.5.3 Marine Pollution

Marine mammals are exposed to contaminants via prey consumption, surrounding water quality, and air quality. Point and non-point source pollutants from coastal runoff, offshore mineral and gravel mining, at-sea disposal of dredged materials and sewage effluent, marine debris, and organic compounds from aquaculture are all threats to marine mammals in the study area. The long-term impacts of these pollutants, however, are difficult to measure. Persistent organic pollutants tend to bioaccumulate through the food chain; therefore, the chronic exposure of persistent organic pollutants in the environment is perhaps of the most concern to high trophic level predators.

4.5.4 Disease

Disease is common in many marine mammal populations and has been responsible for major die-offs worldwide, but such events are usually relatively short-lived. Morbillivirus can lead to death secondary infections, like skin lesions, pneumonia, brain infections, and other impacts and was responsible for an Unusual Mortality Event (UME) for bottlenose dolphins in the Atlantic Ocean in 2013. This UME is now over, but cetaceans are at risk and the virus can spread to cetaceans through the eye, mouth, stomach, skin wounds, or sexual contact (https://media.fisheries.noaa.gov/dam-migration/morbillivirus_cetaceans_(1).pdf). There are no

other known diseases threatening marine mammals in the study area at this time that could potentially affect short-finned pilot whales or bottlenose dolphins.

4.5.5 Increased Vessel Traffic

Any vessel transiting waters inhabited by marine mammals, has a risk of striking a marine mammal. Responses to a ship strike can range from death and serious injury to non-lethal injuries. For this proposed research permit amendment, short-finned pilot whales and bottlenose dolphins are likely to exhibit a variety of behavioral responses to vessel surveys, ranging from no response to short-term avoidance including diving, or a change in swimming speed or direction, and active surface behaviors including lobtailing and breaching.

The research vessel would also produce noise; however, given the small number of research vessels authorized across all research permits in comparison to the large volume of commercial vessels, the added effects of the research vessel are minimal. Further, vessel surveys are currently authorized for Dr. Nowacek's permit; this amendment is not expected to increase the number of surveys conducted or vessels used as a result of authorizing paintball marking as a research method. In addition, the experienced researchers would be searching for marine mammals and would follow the mitigation measures described in the application (and Sections 2.2.1 and 2.2.2) and required in the permits to reduce the effects of close approach by the research vessel. Given the rarity of ship strikes of cetaceans during research activities, the small size of the vessels, the experience of applicants in spotting cetaceans during research activities, and the required mitigation measures, the likelihood of a ship strike from research vessel operations is extremely unlikely and discountable.

4.5.6 Entrapment and Entanglement in Commercial Fishing Gear.

Entrapment and entanglement in commercial fishing gear is one of the most frequently documented sources of human-caused mortality in large whales and small cetaceans. The pelagic longline fishery is estimated to have resulted in the serious injury or mortality of 136 short-finned pilot whales from 2015 to 2019 (Hayes et al. 2022). At least seven fisheries (trawl, gillnet, and longline) interact with bottlenose dolphins in offshore waters of the Atlantic resulting in the serious injury or death of at least 28 dolphins from 2013 to 2017 (Hayes et al. 2022).

Aside from the potential of entrapment and entanglement, there is also concern that many marine mammals that die from entanglement in commercial fishing gear tend to sink rather than strand ashore, thus making it difficult to accurately determine the frequency of such mortalities. Entanglement may also make whales more vulnerable to additional dangers, such as predation and ship strikes, by restricting agility and swimming speed.

4.6 Conclusions and Comparison of Alternatives

By selecting the Preferred Alternative, NMFS expects the impacts from paintball marking to short-finned pilot whales and bottlenose dolphins would be minor to moderate direct and adverse to individual animals from minor injuries (e.g., bruising) that are recoverable (as described in Section 4.3.1). This method is not invasive and thus NMFS does not expect use of paintballs to result in serious injury or mortality of individual animals. As a result, NMFS does not expect the potential for these impacts to translate to population or species level effects and does not expect long-term impacts or reduction in fecundity from these activities, given that mitigation measures

outlined in Section 2.3.2 and the proposed permit amendment are designed to minimize the potential risk of injury from these activities. Therefore, NMFS has determined that the proposed permit amendment to Permit No. 22156-04 would not have a significant cumulative effect on these species.

Under Alternative 3 (No Action), the permit amendment would not be issued and thus no paintball marking would occur under Dr. Nowacek's existing permit. However, as discussed in Section 4.4, without authorizing this scientific research permit amendment, important research questions cannot be answered and OPR would not be able to evaluate the potential for this marking method as a less impactful alternative to invasive tagging methods to answer research questions that can inform the management and conservation of these species.

Chapter 5 List of Preparers and Agencies Consulted

Prepared By: Permits and Conservation Division
Office of Protected Resources
NOAA National Marine Fisheries Service

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Appendix A

Table A2. Permits, LOCs, and pending applications for take of short-finned pilot whales (SPW) and bottlenose dolphins (BND) along the U.S. East Coast.

Permit	Holder/ Applicant	Status	Expiration Date	Species	Location	Take Activities on Live Animals
21482	Daniel Engelhaupt	Active	7/31/2024	BND, SPW	All U.S. Atlantic waters	Level B: Vessel and aerial surveys, UAS, passive acoustic recordings, behavioral observation, photo-identification, video recording, underwater photos and video, tracking, and collecting sloughed skin and fecal samples. Level A: Biopsy sampling and tagging (suction-cup and dart).
21485	Jooke Robbins	Active	12/31/2023	BND, SPW	U.S. East Coast waters and off Puerto Rico	Level B: Unintentional harassment.
21932	Jessica Taylor	Active	4/30/2023	BND	Waters of northern North Carolina, up to 5 miles offshore	Level B: Vessel surveys, behavioral observation, photo-identification, and focal follows.
21938	NMFS Southeast Fisheries Science Center	Active	5/31/2025	BND, SPW	U.S. waters from New Jersey to Texas and international waters of the North Atlantic Ocean	Level B: Vessel and aerial surveys, UAS, passive acoustic recordings, behavioral observation, and photo-identification. Level A: Biopsy sampling and tagging (suction-cup and dart).
22291	Barbara Brunnick	Active	6/30/2025	BND	Coastal waters of Palm Beach and Martin Counties, Florida	Level B: Vessel, behavioral observation, photo-identification, photography, and video.

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Permit	**Holder/ Applicant**	**Status**	**Expiration Date**	**Species**	**Location**	**Take Activities on Live Animals**
22807	Tara Cox	Active	5/31/2024	BND, SPW	Georgia waters	Level B: Vessel surveys, behavioral observation, and photo-identification.
22820	Danielle Brown	Active	5/31/2024	BND	New Jersey waters	Level B: Unintentional harassment.
22856	Patricia Fair	Active	8/31/2024	BND	South Carolina waters	Level B: Vessel surveys, behavioral observation, photogrammetry, and photo-identification.
23069	Florida Atlantic University, Harbor Branch Oceanographic Institute	Active	3/31/2026	BND, SPW	Florida intracoastal and coastal waters	Level B: Vessel surveys, observations, counts, photography, and photo-identification.
23078	Marilyn Mazzoil	Active	2/15/2026	BND	Florida and Georgia waters	Level B: Vessel and aerial surveys, passive acoustic recordings, observations, counts, photogrammetry, photography/video, photo-identification, UAS, and unintentional harassment. Level A: Biopsy and exhaled air sampling.
23310	Patricia Fair	Active	9/15/2025	BND	South Carolina waters	Level B: Vessel surveys, counts, observations, photogrammetry, photography/video, and photo-identification. Level A: Biopsy sampling.

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Permit	**Holder/ Applicant**	**Status**	**Expiration Date**	**Species**	**Location**	**Take Activities on Live Animals**
23644-02	Iain Kerr	Active	10/31/2025	BND, SPW	U.S. and international waters of North Atlantic Ocean	Level B: Vessel and aerial surveys, observations, counts, fecal and exhaled air sampling, passive acoustic recordings, photo-identification, photography/video, photogrammetry, thermal imaging, UAS, and unintentional harassment. Level A: Biopsy sampling, suction-cup tagging by UAS
23673	Wild Dolphin Project	Active	5/31/2025	BND, SPW	Southeast Florida waters	Level B: Vessel surveys, counts, behavioral observation, and photo-identification.
24033	Eric Montie	Active	3/31/2026	BND	South Carolina coastal waters	Level B: Vessel surveys, passive acoustic recordings, behavioral observations, photography, photo-identification and video.
24045	Jeremy Kiszka	Active	2/10/2024	BND	Biscayne Bay and coastal waters of Broward and Miami Dade counties, Florida	Level B: Vessel surveys, behavioral observations, photography, photo-identification, and video.

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Permit	**Holder/ Applicant**	**Status**	**Expiration Date**	**Species**	**Location**	**Take Activities on Live Animals**
24359	NMFS MMHSRP	Active	12/31/2027	BND, SPW	All U.S. waters within the EEZ and international waters.	Emergency response and research including: Level B: Vessel and aerial surveys, UAS, active acoustic playbacks and sonar for prey mapping, passive acoustic recordings, auditory testing, behavioral observation, photo-identification, photogrammetry, photography, underwater photos and video, thermal imaging, tracking, and collect exhaled air, sloughed skin, and fecal samples. Level A: Captures; skin and muscle biopsies; milk, sperm, tooth and urine sampling; ingestible telemetry pill; lavage; markings; measurements, metabolic studies; swabbing; tagging; transport; ultrasound; and weights. Unintentional mortality.
25471	Andrew Read	Active	4/30/2026	BND, SPW	Coastal waters from Georgia to Virginia	Level B: Vessel surveys, behavioral observations, focal follows, and photo-identification.
25740	Center for Coastal Studies	Active	10/31/2026	BND, SPW	Atlantic Ocean shelf and near-shelf waters off the U.S. northeast	Level B: Vessel and aerial surveys, counts, photography, UAS, and unintentional harassment.
26226	Robert DiGiovanni, Jr.	Active	10/31/2027	BND, SPW	Atlantic waters from Maine to Virginia	Level B: Vessel and aerial surveys, counts, behavioral observations, photo-identification, and UAS.

Table A2. Permits, LOCs, and pending applications for take of short-finned pilot whales (SPW) and bottlenose dolphins (BND) along the U.S. East Coast.						
Permit	**Holder/ Applicant**	**Status**	**Expiration Date**	**Species**	**Location**	**Take Activities on Live Animals**
26260	Lesley Thorne	Active	6/30/2027	BND, SPW	New York Bight and adjacent waters of New Jersey and Rhode Island	Level B: Vessel and aerial surveys, counts, behavioral observations, photo-identification, photogrammetry, photography/video, and UAS.
26562	Jim Hain	Active	11/30/2027	BND	Florida coastal waters	Level B: Unintentional harassment.
26594	Anne Zoidis	Active	10/31/2027	BND, SPW	Gulf of Maine and New York Bight	Level B: Vessel and aerial surveys, passive acoustic recording, sloughed skin collection, counts, behavioral observations, photo-identification, photogrammetry, photography/video, UAS, fecal sampling, and underwater photography/video. Level A: Biopsy sampling.
26919	Georgia Department of Natural Resources	Active	4/30/2028	BND	U.S. waters from Florida to Virginia	Level B: Unintentional harassment.
27057	Howard Rosenbaum	Active	7/30/2028	BND, SPW	New York Bight	Level B: Vessel and aerial surveys, behavioral observations, photo-identification, photogrammetry, photography/video, and UAS. Level A: Biopsy sampling and suction-cup tagging.

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Permit	**Holder/ Applicant**	**Status**	**Expiration Date**	**Species**	**Location**	**Take Activities on Live Animals**
27066	NMFS Northeast Fisheries Science Center	Active	7/30/2028	BND, SPW	U.S. EEZ and international waters from Florida to Puerto Rico	Level B: Vessel and aerial surveys, counts, passive acoustic recordings, observations, sloughed skin collection, fecal sampling, photo-identification, photogrammetry, photography/video, tracking, UAS, and unintentional harassment. Level A: Biopsy sampling, exhaled air sampling, and suction-cup tagging.
27241	John Schacke	Active	5/15/2028	BND	Coastal waters of Georgia	Level B: Vessel surveys, counts, observations, photo-identification, photography, and video.