

NATIONAL MARINE FISHERIES SERVICE  
ENDANGERED SPECIES ACT SECTION 7  
BIOLOGICAL AND CONFERENCE OPINION

**Title:** Reissuance of the Pesticide General Permit for Discharge of Pesticide Pollutants into Waters of the United States

**Consultation Conducted By:** Endangered Species Act Interagency Cooperation Division of the Office of Protected Resources, National Marine Fisheries Service

**Action Agency:** United States Environmental Protection Agency, Office of Water

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Director, Office of Protected Resources

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## 1 INTRODUCTION

The Endangered Species Act of 1973, as amended (ESA; 16 U.S.C. 1531 et seq.), jointly administered by the United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS, taken together, the Services), establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat they depend on. Section 7(a)(2) of the ESA requires Federal agencies to insure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their designated critical habitat. Federal agencies must do so in consultation with NMFS for threatened or endangered species (ESA-listed), or designated critical habitat under NMFS' jurisdiction that may be affected by the action (50 CFR §402.14(a)). If a Federal action agency determines that an action “may affect, but is not likely to adversely affect” endangered species, threatened species, or designated critical habitat (a not likely to adversely affect determination, NLAA) and NMFS concurs with that determination for species under NMFS' jurisdiction, consultation concludes informally (50 CFR §402.14(b)).

When consultation is not concluded informally, Section 7(b)(3) of the ESA requires that at the conclusion of consultation, NMFS provide an opinion stating whether the Federal agency's action is likely to *jeopardize the continued existence* of an ESA-listed species or result in *destruction or adverse modification* of designated critical habitat. If NMFS determines that the action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of designated critical habitat, NMFS provides a reasonable and prudent alternative (RPA) that allows the action to proceed in compliance with Section 7(a)(2) of the ESA. If incidental take is expected, ESA section 7(b)(4) requires NMFS to provide an incidental take statement that specifies the impact of any incidental taking and includes reasonable and prudent measures (RPMs) to minimize such impacts and terms and conditions to implement the RPMs.

Updates to the regulations governing interagency consultation became effective September 26, 2019 [84 FR 44976]. While discussions for this consultation preceded this date, formal consultation was initiated after the rule became effective and we are applying the updated regulations to this consultation. As the preamble to the final regulations noted:

*This final rule does not lower or raise the bar on section 7 consultations, and it does not alter what is required or analyzed during a consultation. Instead, it improves clarity and consistency, streamlines consultations, and codifies existing practice. For example, the change in the definition of “effects of the action” simplifies the definition while still retaining the scope of the assessment required to ensure a complete analysis of the effects of the proposed Federal action. The two-part test articulates the practice by which the Services identify effects of the proposed action. Likewise, the causation standard to analyze effects provides additional explanation on how we analyze activities that are reasonably certain to occur.*

The action agency for this consultation is the United States Environmental Protection Agency (EPA). The EPA proposes the reissuance of a National Pollutant Discharge Elimination System (NPDES) general permit to authorize pollutant discharges, specifically chemical pesticide residuals and biological pesticides, to the Waters of the United States from certain pesticide use patterns. The proposed Pesticide General Permit (PGP), as currently drafted, addresses the following four pesticide use patterns:

- Mosquito Control (Larvicide and Adulticide) and Other Flying Insect Pest Control;
- Weed and Algae Pest Control;
- Animal Pest Control; and
- Forest Canopy Pest Control.

EPA estimates that approximately 365,000 pesticide applicators will need to seek PGP coverage nationwide for discharges of pesticide residues to Waters of the United States, with about four percent (or 14,300) of these located in areas where EPA is the NPDES permitting authority for such discharges. It is these discharges that are the subject of the present consultation.

This document represents NMFS' opinion on the effects of EPA re-issuance of the 2021 PGP on the following ESA-listed species and designated critical habitat: Gulf of Mexico Bryde's whale (*Balaenoptera edeni*), North Atlantic right whale (*Eubalaena glacialis*), and Southern Resident Distinct Population Segment (DPS) of killer whale (*Orcinus orca*); salmonids, including Atlantic salmon Gulf of Maine DPS (*Salmo salar*), nine Evolutionarily Significant Units (ESUs) of steelhead trout (*Oncorhynchus mykiss*), nine ESUs of Chinook salmon (*Oncorhynchus tshawytscha*), three ESUs of coho salmon (*Oncorhynchus kisutch*), two ESUs of chum salmon (*Oncorhynchus keta*), and two ESUs of sockeye salmon (*Oncorhynchus nerka*); anadromous non-salmonids, including the shortnose sturgeon (*Acipenser brevirostrum*), three DPSs of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), green sturgeon Southern DPS (*Acipenser medirostris*), and eulachon Southern DPS (*Thaleichthys pacificus*); other fish, including Nassau Grouper (*Epinephelus striatus*), bocaccio Puget Sound/Georgia Basin DPS (*Sebastes paucispinis*), yelloweye rockfish Puget Sound/Georgia Basin DPS (*Sebastes ruberrimus*), giant manta ray (*Manta birostris*), oceanic whitetip shark (*Carcharhinus longimanus*), and two DPSs of scalloped hammerhead (*Sphyrna lewini*); marine turtle species, including hawksbill (*Eretmochelys imbricata*), Kemp's ridley (*Lepidochelys kempii*), leatherback (*Dermochelys coriacea*), olive ridley (*Lepidochelys olivacea*), two DPSs of green turtle (*Chelonia mydas*), and two DPSs of loggerhead turtle (*Caretta caretta*); Pacific coral species: *Acropora globiceps*, *Acropora jacquelineae*, *Acropora retusa*, *Acropora speciosa*, *Euphyllia paradivisa*, *Isopora crateriformis*, *Orbicella annularis*, and *Seriatopora aculeata*; the Caribbean coral species: boulder star coral (*Orbicella franksi*), elkhorn coral (*Acropora palmata*), lobed star coral (*Orbicella annularis*), mountainous star coral (*Orbicella faveolata*), pillar coral (*Dendrogyra cylindrus*), rough cactus coral (*Mycetophyllia ferox*), and staghorn coral (*Acropora cervicornis*); and designated critical habitat for Southern Resident killer whale, Chinook salmon, chum



salmon, coho salmon, sockeye salmon, steelhead trout (with the exception of the eulachon Southern DPS, green sturgeon Southern DPS, Atlantic sturgeon, bocaccio Puget Sound/Georgia Basin DPS, yelloweye rockfish Puget Sound/Georgia Basin DPS, green turtle North Atlantic DPS, leatherback turtle, and loggerhead turtle (Northwest Atlantic DPS)), and critical habitat proposed for ESA-listed Caribbean Indo-Pacific corals.

This consultation, biological opinion, and incidental take statement, was prepared by NMFS Office of Protected Resources Endangered Species Act Interagency Cooperation Division (“We”) in accordance with section 7(a)(2) of the statute (16 U.S.C. 1536(a)(2)), associated implementing regulations (50 CFR Part 402), and agency policy and guidance. A complete record of this consultation is on file at the NMFS Office of Protected Resources in Silver Spring, Maryland.

## **1.1 Background**

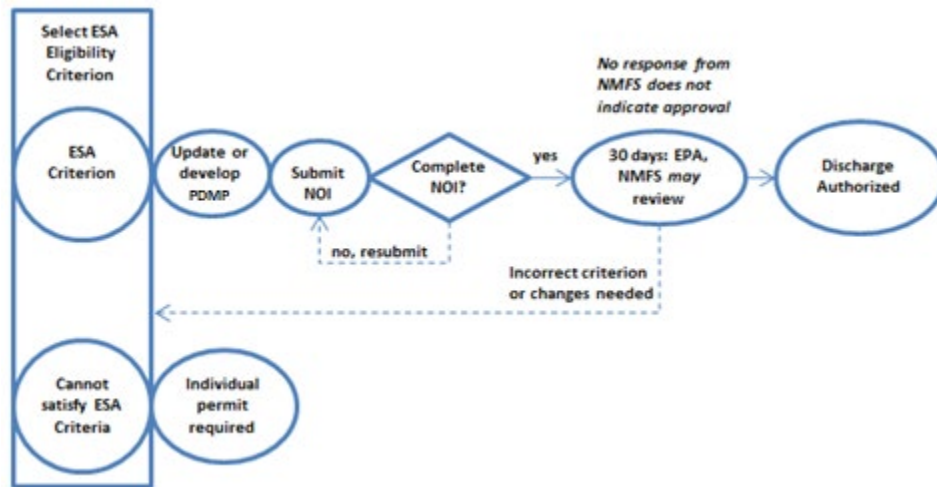
Under the Federal Insecticide Fungicide and Rodenticide Act (FIFRA), pesticides are registered for specific uses. Pesticide labels contain specific instructions for applicators to follow for those specific uses. The Administrator will register a pesticide if, after a review of the data submitted, it is determined that the pesticide will perform its intended function without unreasonable adverse effects on the environment. The PGP includes additional requirements, over and above those already required under FIFRA.

The EPA’s statutory authority for the PGP is the NPDES of the Clean Water Act (33 USC §§ 1342 et seq.). The Clean Water Act establishes the basic structure for regulating discharges of pollutants into and regulating quality standards for the Waters of the United States EPA’s NPDES permit program controls point source discharges. Point sources are discrete conveyances such as pipes or man-made ditches. The purpose of the PGP is to satisfy the goals and policies of the Clean Water Act (33 USC §1251). The Clean Water Act makes it unlawful to discharge any pollutant from a point source into navigable waters without a permit, Section 2.1.1 of the Biological Evaluation (BE) submitted by EPA to inform this consultation reviewed the Legal and Procedural background for the PGP establishing the requirement to obtain a permit for discharges of biological pesticides and chemical pesticides that leave a residue. In the case of the PGP, the point source subject to NPDES is the pesticide application device. The PGP is reissued every five years at which time permit holders are required to renew their coverage.

### **1.1.1 The ESA Eligibility Requirement for Coverage Under an EPA General Permit**

It is EPA’s policy that discharges that may result in adverse effects to ESA-listed species and/or designated critical habitat that are not accounted for in the incidental take statement of a biological opinion or incidental take permit are not eligible for coverage under its General Permits, including the PGP. The EPA’s General Permits use an ESA Eligibility Certification procedure that identifies discharges in need of the Services’ expertise in reviewing notices of intent to discharge (NOI) to ensure that discharges are not expected to result in unauthorized take of ESA-listed species and/or designated critical habitat. This is termed a “consistency review.” If

NMFS finds that discharges under an NOI may result in unauthorized take of ESA-listed species, we may either provide technical assistance, identifying changes to the Pesticide Discharge Management Plan or other aspects of the activity to avoid take, or inform EPA that the discharge is ineligible for coverage under the General Permit and will require an individual permit. Successful implementation of the NOI ESA Eligibility Certification process for the PGP is required for EPA to meet its obligations under the ESA. Figure 1 illustrates this process.



**Figure 1. Preparation, submittal, and approval sequence for documents required under the ESA Eligibility Certification process of the PGP**

### 1.1.2 Prior ESA Section 7 Consultations

NMFS conducted formal ESA section 7 consultations on both the 2011 and 2016 iterations of the PGP and produced programmatic biological opinions evaluating the expected effects of discharges, as authorized under the permit, and the planned implementation of each iteration of the permit. The analyses in NMFS' opinions determined that discharges authorized by EPA were likely to jeopardize ESA-listed species and destroy or adversely modify designated critical habitat. The Reasonable and Prudent Alternative for the 2016 PGP required EPA to update the definition of NMFS' species of concern, and improve tools for accurately identifying the presence of ESA-listed species under NMFS' jurisdiction and certifying ESA eligibility on NOI. Take that is incidental to the action was authorized as long as the Reasonable and Prudent Alternative was adopted by EPA. The Reasonable and Prudent Measures required EPA to: (1) monitor the direct, indirect, and cumulative impacts of the activities authorized by the issuance of the general permit; and (2) evaluate the direct, indirect, or aggregate impacts of the activities authorized by the issuance of the general permit and the consequences of those effects on ESA-listed species under NMFS' jurisdiction. The purpose of the monitoring is to provide data for the EPA to use to identify necessary modifications to the general permit in order to increase awareness among the regulated community of the need to recognize and address any risks to ESA-listed resources under NMFS' jurisdiction, thereby minimizing take.

EPA has also consulted with NMFS under section 7(a)(2) of the ESA on the registration of several pesticides for ESA-listed resources under NMFS' jurisdiction on the West Coast<sup>1</sup>. The outcomes of the pesticide consultations between 2008 and 2015 identifying risks to ESA-listed salmonids are summarized in Table 15 of NMFS' opinion on the 2016 PGP. The final biological opinion for these malathion, diazinon, and chlorpyrifos chemicals addressed all domestic ESA-listed species under NMFS' jurisdiction issued in December 2017. It concluded that EPA registration of chlorpyrifos is likely to jeopardize the continued existence of 38 species and to destroy or adversely modify the designated critical habitat of thirty-seven listed species, registration of diazinon is likely to jeopardize the continued existence of twenty-five listed species and to destroy or adversely modify the designated critical habitat of eighteen listed species, and registration of malathion is likely to jeopardize the continued existence of thirty-eight listed species and to destroy or adversely modify the designated critical habitat of thirty-seven species. Table 1 compares NMFS' determinations for pesticide reregistrations consulted upon with the frequency those pesticides occur in annual reports over the 2016-2021 PGP permit term.

**Table 1. NMFS' determinations for pesticide re-registrations consulted upon for West Coast species and the frequency those pesticides occurred in PGP annual reports over the 2016-2021 PGP permit term.**

Pesticide	2017	2018	2019	2020	Jeopardy	Adverse Modification
2,4-D	112	76	67	69	✓	✓
Carbaryl	15	11	9	4	✓	✓
Chlorothalonil	21	23	26	11		✓
Chlorpyrifos	2	3	1	1	✓	✓
Diazinon	13	11	14	15	✓	✓
Diuron	11	7	6	5		✓
Malathion	3	4	2	3	✓	✓
Naled	5	2	1	1	✓	✓
Oryzalin	1	1			✓	✓
Pendimethalin	7	2	6	4	✓	✓
Triclopyr BEE	30	43	38	54		

<sup>1</sup> See: <http://www.nmfs.noaa.gov/pr/consultation/pesticides.htm>

### 1.1.3 NPDES Compliance

Non-compliance under the NPDES permitting program is significant. According to EPA Office of Enforcement and Compliance Assurance (USEPA 2020), “*over 29 percent of NPDES permitted facilities were in significant noncompliance with their permits in FY 2018. Violations range from significant exceedances of effluent limits, which can cause harm to human health and the environment, to failure to submit reports, which can mask serious deficiencies.*” As a result, EPA’s National Compliance Initiative was established to cut significant non-compliance in half and to ensure that the most serious violations are addressed in a timely and appropriate manner.

The specific pollutants, locations, and timing of discharges to be authorized under the PGPs are unknown until an annual report is filed by a Decision-maker<sup>2</sup>. While any discharges made to waters where ESA-listed species occur require an NOI, the PGPs have had no mechanism to confirm compliance with that requirement. Compliance is demonstrated by valid submissions of notices of intent to discharge, maintaining written records, and submission of annual reports by those required to submit annual reports.

### 1.1.4 Consultation History

On October 7, 2019, NMFS provided EPA with an updated master list of contacts that should be receiving and reviewing Pesticide General Permit NOI.

On February 25, 2020, EPA met with NMFS and the USFWS for a pre-consultation kickoff meeting for the upcoming PGP.

On February 27, 2020, NMFS sent EPA an updated species list, text that would be useful in updating EPA’s BE, and the programmatic (implementation) analysis from NMFS’ opinion on the 2016 PGP as a refresher for how NMFS consults on such actions.

On April 13, 2020, EPA and NMFS held a follow up call to review general notes and questions regarding consultation. The EPA indicated that it planned to structure the 2021 BE the same as the 2016 BE, and make updates to the existing 2016 BE, as needed.

On April 20, 2020, NMFS shared an annotated species list suggesting strategies for EPA to address determinations for species that do not occur in the areas planned for assessment. EPA shared its notes from the April 13, 2020 meeting, including responses to NMFS’ questions.

On April 30, 2020, EPA shared the final annual report required by the terms and conditions of NMFS’ 2016 biological opinion.

On January 15, 2021, EPA published the Draft PGP in the Federal Register for public comment. The draft included the following statement:

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<sup>2</sup> A Decision-maker is any entity with control over the decision to perform pesticide applications, including the ability to modify those decisions that result in a discharge to Waters of the United States.

“[This permit specifies procedures to protect federally-listed endangered and threatened species and federally designated critical habitats. Below are procedures included in EPA’s final 2016 PGP. EPA is currently conducting consultations under the Endangered Species Act (ESA) with the United States Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) (together, the “Services”) for the reissuance of the PGP. Based on the results of consultation with the Services, EPA may include additional or altered conditions to the final permit.]”

On January 19, 2020, NMFS reminded EPA to direct the PGP operators to NMFS’ mappers to determine if discharges will affect ESA-listed species under NMFS jurisdiction.

On March 2, 2020, EPA sent an initiation package to request formal consultation on the 2021 PGP pursuant to the requirements of section 7 of the ESA.

Between March 5 and March 16 2021 a series of e-mails between NMFS and EPA considered the proposed critical habitats for ESA-listed Caribbean and Indo-Pacific corals and arrived at a decision to include these in the opinion.

On March 19, 2021, NMFS sent EPA a letter initiating formal consultation.

From April through June 2021, using the ongoing PGP consultation as a model, e-mails and conference calls between NMFS and representatives from each of EPA’s general permits addressed strategies worked to harmonize the PGP, Construction General Permit, and Multisector General Permit with the intent of increasing the consistency and quality of the information provided by permit applicants. This effort also arrived at language to avoid the appearance of general permit applicants making ESA “not likely to adversely affect” determinations in the place of EPA.

From June 7 to June 11, 2021, EPA and NMFS collaborated on edits to the PGP and pesticide permitting webpage to satisfy the mutually agreed upon RPA and RPMs.

## **2 THE ASSESSMENT FRAMEWORK**

Section 7(a)(2) of the ESA requires Federal agencies, in consultation with NMFS, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species; or adversely modify or destroy their designated critical habitat.

The PGP applies to pesticide residue discharges with unknown timing, frequencies, and intensities from multiple pest treatment events over a large geographic area occurring over a five-year permit term. The EPA estimates that approximately 365,000 pesticide applicators will need to seek NPDES permit coverage nationwide, with about four percent (or 14,300) of these located in areas where EPA is the NPDES permitting authority for such discharges. Operator is defined in Appendix A of the draft 2021 PGP to mean any entity associated with the application of pesticides which results in a discharge to Waters of the United States that meets either of the following two criteria: (1) any entity who performs the application of a pesticide or who has day-to-day control of the application (i.e., they are authorized to direct workers to carry out those

activities); or (2) any entity with control over the decision to perform pesticide applications including the ability to modify those decisions. Operators identified in (1) above are referred to in the PGP as Applicators while Operators identified in (2) are referred to in the permit as Decision-makers.

The PGP applies to discharges with unknown constituents, timing, frequencies, and intensities at unknown locations over a large geographic area occurring over a five-year permit term. Traditional approaches to section 7 consultations, which analyzes the effects of a specific action, are not designed to address the number, spatial, and temporal scales of pesticide discharges under the PGP. The opinions for the 2011 and 2016 iterations of the PGP applied a programmatic approach that evaluates the structure and decision-making processes of the PGP to determine whether they are likely to insure that the authorized discharges collectively comply with the requirements of section 7(a)(2) given the number, spatial, and temporal scales of discharges authorized under the PGP.

Programmatic consultations are consultations addressing an agency's multiple actions on a program, region, or other basis. Programmatic consultations allow NMFS to consult on the effects of programmatic actions such as a proposed program, plan, policy, or regulation providing a framework for future proposed actions (50 CFR 402.02). Framework programmatic action means, for purposes of an incidental take statement, a Federal action that approves a framework for the development of future action(s) that are authorized, funded, or carried out at a later time, and any take of a listed species would not occur unless and until those future action(s) are authorized, funded, or carried out and subject to further section 7 consultation. A mixed programmatic action, such as EPA's PGP, is a Federal action that approves action(s) that will not be subject to further section 7 consultation, and also approves a framework for the development of future action(s) that are authorized, funded, or carried out at a later time and any take of a listed species would not occur unless and until those future action(s) are authorized, funded, or carried out and subject to further section 7 consultation.

The EPA framework for the PGP requires that authorized discharges do not result in short or long term adverse effects to ESA-listed species or designated critical habitat that any take resulting from discharges is exempted by an incidental take statement or an ESA section 10 permit. NMFS conducts consistency reviews of the NOI to evaluate whether proposed discharges are consistent with this requirement. This opinion addresses the framework of the PGP, including implementation of eligibility certification, monitoring requirements, inspection and reporting requirements, and best management practices. An ESA section 7 assessment for this opinion involves the following steps:

*Description of the Action* (Section 3): In this framework programmatic consultation, the description of the action describes the PGP elements that have been added to or changed for the 2021-2026 permit term.

*Action Area* (Section 4): We determine the degree of overlap between the discharges that would be authorized by the PGP, as proposed for the 2021-2026 permit term, with the ranges of

endangered and threatened species and designated critical habitat under NMFS' jurisdiction to describe the action area within the spatial extent of stressors caused by the discharges.

*Species and Critical Habitat Considered in this Opinion (Section 5):* We identify ESA-listed species and designated critical habitat that are likely to co-occur with the stressors from the action in space and time and evaluate the status of those species and habitat. We first identify the new species or listing changes that have occurred since NMFS' consultation on the 2016 PGP in Section 5.1.

The 2021 PGP's action area overlaps with the range and designated critical habitat for Atlantic sturgeon which now includes spawning habitat in portions of the Mattaponi and Pamunkey Rivers flowing through Indian Lands belonging to the two respective Tribes. In 2018, EPA approved Idaho's application to administer and enforce its own NPDES permitting program. As a result EPA is only the permitting authority for Indian Country Lands in Idaho. While most of the state of Idaho is no longer part of the action area for the PGP, ESA-listed Snake River salmonids would still be exposed to PGP discharges because they must migrate through the Washington state to reach Idaho waters. EPA will not, however, authorize discharges to the spawning and rearing waters for these species that are not within tribal lands.

*Recent Listings and Listing Updates, Designated and Proposed Critical Habitat.* Section 5.1 describes additional species considered due to the change in the action area for the 2021 PGP. This is followed by Section 5.2. Updates to the 2016 PGP Status of Species.

*Updates to the Environmental Baseline (Section 6):* We describe changes since NMFS' consultation on the 2016 PGP in the environmental baseline as the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline.

*Updates to the Effects of the Action (Section 7.1):* We describe any changes to the *Effects of the Action* analyzed in NMFS' opinion on the 2016 PGP resulting from the changes in the action area and recently published toxicity data. The effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action. NMFS' opinion for the 2016 PGP determined that ESA-listed species and designated critical habitats were likely to be adversely affected, so the opinion proceeded with a programmatic analysis to examine the general permit's structure and decision-

making processes to ensure that the authorized actions under the permit collectively complies with the requirements of section 7(a)(2).

*Changes affecting Permit Implementation* (Section 7.1.4) updates the programmatic analysis in NMFS' 2016 opinion on the PGP. This section evaluates the changes made in implementation of the PGP for the 2022-2027 permit term. As stated in NMFS' opinion on the 2016 PGP, general permits authorized by Federal agencies apply to activities over large geographic areas occurring over long periods of time, with substantial uncertainty about the number, location, timing, frequency, and intensity of specific activities those programs authorize, fund, or carry out. Traditional approaches to section 7 consultations are not designed to address the spatial and temporal scales and level of uncertainty that is typical of consultations on general permits. This opinion updates the programmatic analysis of the 2016 PGP based on changes made to the 2021 PGP and information from the annual reports using the following seven elements:

- **Scope:** Is the general permit structured to reliably estimate the probable number, location and timing of the discharges that would be authorized by the program?
- **Stressors:** Is the general permit structured to reliably estimate the physical, chemical, or biotic stressors that are likely to be produced as a result of the discharges that would be authorized (that is, the stressors produced by the actual discharges to Waters of the United States)?
- **Overlap:** Is the general permit structured to reliably estimate whether or to what degree specific endangered or threatened species or designated critical habitat are likely to be exposed to potentially harmful effects that the proposed permit would authorize?
- **Monitoring/Feedback:** Is the general permit structured to identify, collect, and analyze information about authorized actions that may have exposed endangered or threatened species or designated critical habitat to stressors at concentrations, intensities, durations, or frequencies that are known or suspected to produce physical, physiological, behavioral, or ecological responses that have potential individual or cumulative adverse consequences for individual organisms or the physical and biological features (PBFs) of designated critical habitat?
- **Responses of Listed Resources:** Does the general permit incorporate an analytical methodology that considers:
  - Status and trends of endangered or threatened species or designated critical habitat;
  - Demographic and ecological status of populations and individuals of those species given their exposure to pre-existing stressors in different drainages and watersheds;
  - Pathways by which endangered or threatened species or designated critical habitat might be exposed to the discharges to Waters of the United States; and



- Physical, physiological, behavioral, sociobiological, and ecological consequences of exposing endangered or threatened species or designated critical habitat to stressors from discharges at concentrations, intensities, durations, or frequencies that could produce physical, physiological, behavioral, or ecological responses, given their pre-existing demographic and ecological condition?
- Compliance: Does the general permit have a mechanism to reliably determine whether or to what degree operators have complied with the conditions, restrictions or mitigation measures the proposed permit requires when they discharge to Waters of the United States?
- Adequacy of Controls: Does the general permit have a mechanism to change the action to prevent or minimize endangered or threatened species or designated critical habitat from being exposed to stressors from discharges at concentration, durations or frequencies that may have adverse effects to individual listed organisms, populations or species or PBFs of designated critical habitat?

*Updates to Cumulative Effects* (Section 8): Cumulative effects are the effects to ESA-listed species and designated critical habitat of future state or private activities that are reasonably certain to occur within the action area (50 CFR §402.02). Effects from future Federal actions that are unrelated to the action are not considered because they require separate ESA section 7 compliance.

*Integration and Synthesis* (Section 9): We evaluate the updates to the species' status (Section 5.2) and the Environmental Baseline (Section 6) and formulate risk hypotheses based on the anticipated exposure of listed species and critical habitat to stressors and the likely response of species and habitats to this exposure. We consider the effects of the action within the action area on populations or subpopulations and on PBFs when added to the environmental baseline and the cumulative effects to determine whether the action could reasonably be expected to:

- Reduce appreciably the likelihood of survival and recovery of ESA-listed species in the wild by reducing its numbers, reproduction, or distribution, and state our conclusion as to whether the action is likely to jeopardize the continued existence of such species; or
- Appreciably diminish the value of designated critical habitat for the conservation of an ESA-listed species, and state our conclusion as to whether the action is likely to destroy or adversely modify designated critical habitat.

The results of our jeopardy and adverse modification analyses are summarized in the *Conclusion* (Section 10). If, in completing the last step in the analysis, we determine that the action under consultation is likely to jeopardize the continued existence of ESA-listed species or destroy or adversely modify designated critical habitat, then we must identify a reasonable and prudent alternative(s) to the action, if any, or indicate that to the best of our knowledge there are no reasonable and prudent alternatives (see 50 CFR §402.14(h)(2)).

The *Incidental Take Statement* (ITS, section 11) sets limits or boundaries on the total amount of incidental take expected as a result of the programmatic action as a whole. The ITS specifies the impact of the take, reasonable and prudent measures to minimize the impact of the take, and terms and conditions to implement the reasonable and prudent measures (ESA section 7 (b)(4); 50 CFR §402.14(i)). Step-down consultations and project-specific ITS are not part of this consultation because the PGP only authorizes discharges that are consistent with an NLAA determination, or for which take has already been authorized. EPA expects that NMFS' review of NOI will identify and prevent discharges that are not consistent with an NLAA determination, or for which take has not been authorized.

We provide discretionary *Conservation Recommendations* (section 12) that may be implemented by the action agency (50 CFR §402.14(j)). Finally, we identify the circumstances in which *Reinitiation of Consultation* (section 13) is required (50 CFR §402.16).

## 2.1 Information Used in this Assessment

To comply with our obligation to use the best scientific and commercial data available, we collected information identified through searches of Web of Science, scientific publisher databases (e.g., Elsevier), government databases (e.g., EPA's National Service Center for Environmental Publications), and literature cited sections of peer reviewed articles, species listing documentation, and reports published by government and private entities. This opinion is based on our review and analysis of various information sources, including:

- EPA's BE
- PGP 2020 report, data and analysis
- The draft 2021 PGP Permit and fact sheet
- data from the following databases:
  - The National Water Quality Monitoring Councils' Water Quality Portal (WQP)
  - EPA's Enforcement Compliance and History Online (ECHO)
  - EPA's NOI database for the 2016 PGP
  - EPA's Ecotoxicology Knowledgebase (ECOTOX)
- government scientific publications, including status reviews, recovery plans, and listing notices for ESA-listed species and designated critical habitat
- reports on the status and trends of water quality
- NMFS' opinion for the 2016 PGP and opinions reviewed from prior pesticide reregistrations, and
- the best available commercial and scientific information, including peer reviewed research.

These information sources provided information relevant to the potential stressors and responses of ESA-listed species and designated critical habitat under NMFS' jurisdiction that may be affected by the proposed action. This information was used to evaluate the action's framework in order to draw conclusions on risks the action may pose to the continued existence of these species and the value of designated critical habitat for the conservation of ESA-listed species.

In 2019, NMFS and the USFWS revised regulations for implementing section 7 of the ESA to clarify, interpret, and implement portions of the Act concerning the interagency cooperation procedures. Among these revisions was § 402.14(h)(3) that allows the Services to adopt all or part of a Federal agency's initiation package. Rather than repeat the content of these resources in this opinion, they are adopted and referenced where needed. Similarly, rather than repeat information and analyses used in the NMFS' opinion for the 2021 PGP, the opinion is referenced where appropriate and the text in this opinion explains why the information or analyses are still valid.

### **3 DESCRIPTION OF THE ACTION**

Once issued, the final 2021 PGP will replace the 2016 PGP , which was issued for a five-year term on October 31, 2016 (81 FR 75816) and expires October 31, 2021, at midnight. Many of the permit requirements of the 2016 PGP remain unchanged in the proposed 2021 PGP. The EPA's BE for the 2021 PGP is thus largely unchanged from the BE for the 2016 PGP. Not all 2021 PGP changes are substantive, so they are not considered in this consultation. For example, Appendix B was modified to reflect language of 40 CFR §122.41 and omits conditions specified in the PGP itself. This opinion adopts the BE submitted with EPA's request for consultation as a detailed description of the action and relies on the analyses in NMFS' opinion on the 2016 PGP for those aspects of the permit that have not been changed for the 2021-2026 permit term. The draft 2021 PGP includes the following changes from the 2016 PGP:

- Removes the out-of-date NOI provision that provided automatic coverage for all Operators until January 12, 2017 (nonsubstantive).
- Replaces the requirement to use the EPA's eNOI system with EPA's NPDES eReporting Tool (NeT) when preparing and submitting NOI, notices of termination, and annual reports (affects consistency and quality of information from applicants).
- Updates Appendix A, *Definitions, Abbreviations, and Acronyms* to include the term "Pesticide discharges to Waters of the United States from pesticide application" as defined in 40 CFR §122.2 (nonsubstantive).
- Modifies Appendix B, Standard Permit Conditions, to ensure consistency with 40 CFR §122.41 (the 2016 PGP Appendix B included PGP-specific elements and language; nonsubstantive).
- Updates Appendix C, Areas Covered, to add Indian Country within Virginia and Indian Country within Indiana, and to remove the State of Idaho, which has attained delegated

authority to implement the Clean Water Act (restricts designated critical habitat for Snake River Salmonids to Indian Country Lands and adds the Pamunkey and Mattaponi Rivers portions of Atlantic sturgeon designated critical habitat).

Only substantive changes are addressed in this opinion. The change identified in the second above is addressed in this opinion because this provides the opportunity to increase the consistency and quality of information applicants provide to substantiate that their discharges will not likely result in any short or long term adverse effects. The change identified in the fifth bullet is addressed in this opinion because this affects the action area overlap with designated critical habitat.

### **3.1 Anticipated Number of Dischargers**

EPA estimates that approximately 365,000 pesticide applicators will need to seek PGP coverage nationwide for discharges of pesticide residues to Waters of the United States, with about four percent (or 14,300) of these located in areas where EPA is the NPDES permitting authority for such discharges. It is these discharges that are the subject of the present consultation. Among dischargers in states where ESA-listed species under NMFS' jurisdiction occur, 275 were required to file NOI for the 2016 PGP and 108 were required to file annual reports.

### **3.2 Conservation Measures to Avoid Exposure**

Conservation measures other than those already required by the 2016 PGP have not been developed.

## **4 ACTION AREA**

The action area is defined by regulation as “all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action” (50 CFR §402.02). Section 5 of NMFS' opinion for the 2016 PGP includes an inventory and maps of the distribution of HUC 12 watersheds that are subject to PGP. With the exception of watersheds within Idaho noted in Figure 2 of NMFS' opinion on the 2016 PGP, the action area for the 2021 PGP includes waters that may be directly affected where EPA has NPDES permitting authority and other waters affected by discharges to those waters. For example, the Connecticut River flows through Massachusetts into Connecticut. While EPA does not have permitting authority in Connecticut, authorized discharges to the Connecticut River at the state border potentially expose the ESA-listed sturgeon in Connecticut if the discharges are highly toxic or of great volume.

Those areas where EPA is the NPDES permitting authority for the 2021-2026 PGP permit term include:

- Washington D.C., Massachusetts, New Hampshire, New Mexico, and Puerto Rico;
- The Pacific Territories of American Samoa, Guam, Northern Marianas Islands, Johnson's Atoll, Midway Island, and Wake Island;

- Indian Country in Alabama, Arizona, California, Colorado, Connecticut, Florida, Iowa, Kansas, Louisiana, Michigan, Minnesota, Mississippi, Montana, Nebraska, New York, North Carolina, North Dakota, Oregon, Rhode Island, South Carolina, South Dakota, Utah, Virginia, Washington, Wisconsin, and Wyoming;
- Federal Operators in Colorado, Delaware, Vermont, and Washington; and
- Designated Areas in Oklahoma and Texas. The EPA has retained authorization to issue permits for activities associated with the exploration, development, or production of oil or gas or geothermal resources, including transportation of crude oil or natural gas by pipeline.

The action area specified in EPA’s BE includes “Waters of the United States,” as defined in 40 CFR §122.2. That provision defines “Waters of the United States” as certain inland waters (i.e. streams, rivers, lakes, ponds) and the territorial sea, which generally extends three miles (4.8 kilometers) from shore<sup>3</sup>. NMFS expects that PGP-authorized discharges would be indistinguishable from other sources at the outer boundary of the territorial seas.

## **5 SPECIES AND DESIGNATED AND PROPOSED CRITICAL HABITAT CONSIDERED IN THIS OPINION**

Section 6.1 of our opinion on the 2016 PGP determined that exposures to pesticide discharges authorized under the permit would be extremely unlikely for those species that do not frequent coastal waters where EPA has permitting authority. We concluded that, because exposures were extremely unlikely, discharges authorized by the 2016 PGP are not likely to adversely affect the following species:

- blue whale (*Balaenoptera musculus*, endangered)
- fin whale (*Balaenoptera physalus*, endangered)
- sei whale (*Balaenoptera borealis*, endangered)
- sperm whale (*Physeter macrocephalus*, endangered)
- humpback whale<sup>4</sup> (*Megaptera novaeangliae*, endangered at time of 2016 consultation)
- North Atlantic right whale (*Eubalaena glacialis*, endangered) and designated critical habitat

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<sup>3</sup> Permitting under NPDES applies to waters beyond the territorial sea. Section 402 authorizes permits which “apply, and insure compliance with, any applicable requirements of sections 301, 302, 306, 307, and 403.” Section 403 of the Clean Water Act addresses ocean discharges, including the territorial sea, the contiguous zone, and the ocean. The term “contiguous zone” means the entire zone established or to be established by the United States under article 24 of the Convention of the Territorial Sea and the Contiguous Zone. The term “ocean” means any portion of the high seas beyond the contiguous zone.

<sup>4</sup> Since issuing the 2016 opinion, NMFS reevaluated the status of the humpback whale populations in the Atlantic and Pacific Oceans. As a result, there are no ESA-listed DPS of humpback whale in the action area.

- scalloped hammerhead (*Sphyrna lewini*, endangered) Eastern Pacific DPS and Central and Southwest Atlantic DPS.

NMFS' opinion on the 2016 PGP also concluded that, while EPA has permitting authority for Indian Country Lands in California and states along the Gulf of Mexico, these lands are far inland so exposures of marine ESA-listed species to pesticide discharges authorized under the PGP are extremely unlikely (i.e., effects would be discountable), therefore PGP-authorized discharges are not likely to adversely affect the following species:

- smalltooth sawfish (*Pristis pectinata*, endangered)
- Gulf sturgeon (*Acipenser oxyrinchus desotoi*, threatened)
- white abalone (*Haliotis sorenseni*, endangered)
- black abalone (*Haliotis cracherodii*, endangered)

With the exception of the North Atlantic right whale, this opinion does not re-consider not likely to adversely affect determinations made in NMFS opinion for the 2016 PGP.

Section 5.1 evaluates ESA-listings, listing updates, and critical habitat that have been designated or proposed since the opinion on the 2016 PGP was issued. In this section we also reconsider the NLAA determination in the 2016 PGP biological opinion for North Atlantic right whale due to increased mortality rates and decreased reproduction between 2017 and 2020.

Section 5.2 updates the status of the species and designated critical habitat with recent information for those species NMFS determined likely to be adversely affected by discharges authorized under the 2016 PGP. Table 2 below identifies the ESA-listed species and designated and proposed critical habitat, including DPSs and ESUs, under NMFS' jurisdiction that are considered in Sections 5.1 and 5.2.

**Table 2. Endangered and threatened species evaluated in this opinion**

Species	ESA Status	Critical Habitat	Recovery Plan
<b>Marine Mammals – Cetaceans</b>			
Killer Whale ( <i>Orcinus orca</i> ) – Southern Resident DPS	<u>E – 70 FR 69903</u> <u>Amendment 80 FR 7380</u>	<u>71 FR 69054</u> <u>84 FR 49214</u> (proposed)	<u>73 FR 4176</u> <u>01/2008</u>
North Atlantic Right Whale – ( <i>Eubalaena glacialis</i> )	<u>E – 73 FR 12024</u>	<u>81 FR 4837</u>	<u>70 FR 32293</u> <u>08/2004</u>
Bryde's Whale ( <i>Balaenoptera edeni</i> ) – Gulf of Mexico subspecies	<u>E – 84 FR 15446</u>	-- --	-- --
<b>Marine Reptiles</b>			
Green Turtle ( <i>Chelonia mydas</i> )	<u>81 FR 20057</u>	-- --	<u>63 FR 28359</u>
– East Pacific DPS	T		<u>01/1998</u>
– Central North Pacific DPS	T		
– Central West Pacific DPS	E		
– North Atlantic DPS	T	<u>63 FR 46693</u>	<u>10/1991 – United States Atlantic</u>

Species	ESA Status	Critical Habitat	Recovery Plan
Hawksbill Turtle ( <i>Eretmochelys imbricata</i> )	<u>E – 35 FR 8491</u>	<u>63 FR 46693</u>	<u>57 FR 38818</u> 08/1992 – United States Caribbean, Atlantic, and Gulf of Mexico <u>63 FR 28359</u> 05/1998 – United States Pacific
Kemp’s Ridley Turtle ( <i>Lepidochelys kempii</i> )	<u>E – 35 FR 18319</u>	-- --	<u>03/2010</u> – United States Caribbean, Atlantic, and Gulf of Mexico <u>09/2011</u>
Leatherback Turtle ( <i>Dermochelys coriacea</i> )	<u>E – 35 FR 8491</u>	<u>44 FR 17710 and 77 FR 4170</u>	<u>10/1991</u> – United States Caribbean, Atlantic, and Gulf of Mexico <u>63 FR 28359</u> 05/1998 – United States Pacific
Loggerhead Turtle ( <i>Caretta caretta</i> )	<u>76 FR 58868</u>	-- --	<u>63 FR 28359</u>
– North Pacific Ocean DPS	E		
– Northwest Atlantic Ocean DPS	T	<u>79 FR 39855</u>	<u>74 FR 2995</u> <u>10/1991</u> – United States Caribbean, Atlantic, and Gulf of Mexico 05/1998 – United States Pacific <u>01/2009</u> – Northwest Atlantic
South Atlantic Ocean DPS	T	-- --	-- --
Olive Ridley Turtle ( <i>Lepidochelys olivacea</i> ) All Other Areas/Not Mexico’s Pacific Coast Breeding Colonies	<u>T – 43 FR 32800</u>	-- --	-- --
<b>Salmonids</b>			
Atlantic Salmon ( <i>Salmo salar</i> ) – Gulf of Maine DPS	<u>E – 74 FR 29344 and 65 FR 69459</u>	<u>74 FR 39903</u>	<u>70 FR 75473 and 81 FR 18639 (Draft)</u> <u>11/2005</u> <u>03/2016</u> – Draft <u>2/2019- Final</u>
Chinook Salmon ( <i>Oncorhynchus tshawytscha</i> )	<u>70 FR 37160</u>		
– California Coastal ESU	T	<u>70 FR 52488</u>	<u>81 FR 70666</u>
– Central Valley Spring-Run ESU	T	“	<u>79 FR 42504</u>
– Lower Columbia River ESU	T	<u>70 FR 52629</u>	<u>78 FR 41911</u>
– Upper Columbia River Spring-Run ESU	E	“	<u>72 FR 57303</u>
– Upper Willamette River ESU	T	“	<u>76 FR 52317</u>
– Puget Sound ESU	T	“	<u>72 FR 2493</u>
– Sacramento River Winter-Run ESU	E	<u>58 FR 33212</u>	<u>79 FR 42504</u>
– Snake River Fall-Run ESU	T	Not in action area	<u>11-2017</u>
– Snake River Spring/Summer Run ESU	T	Not in action area	<u>11-2017</u>

Species	ESA Status	Critical Habitat	Recovery Plan
Chum Salmon ( <i>Oncorhynchus keta</i> )	<u>70 FR 37160</u>		
– Columbia River ESU	T	<u>70 FR 52629</u>	<u>78 FR 41911</u>
– Hood Canal Summer-Run ESU	T	“	<u>72 FR 29121</u>
Coho Salmon ( <i>Oncorhynchus kisutch</i> )	<u>70 FR 37160</u>		
– Central California Coast ESU	<u>E</u>	<u>64 FR 24049</u>	<u>77 FR 54565</u>
– Southern Oregon and Northern California Coasts ESU	T	“	<u>79 FR 58750</u>
– Lower Columbia River ESU	<u>T</u>	<u>81 FR 9251</u>	<u>78 FR 41911</u>
– Oregon Coast ESU	<u>T – 73 FR 7816</u>	<u>73 FR 7816</u>	<u>81 FR 90780</u>
Sockeye Salmon ( <i>Oncorhynchus nerka</i> )	<u>70 FR 37160</u>		
– Ozette Lake ESU	T	<u>70 FR 52630</u>	<u>74 FR 25706</u>
– Snake River ESU	E	Not in action area	<u>80 FR 32365</u>
Steelhead Trout ( <i>Oncorhynchus mykiss</i> )	<u>71 FR 834</u>		
– California Central Valley DPS	T	<u>70 FR 52487</u>	<u>79 FR 42504</u>
– Central California Coast DPS	T	“	<u>81 FR 70666</u>
– Northern California DPS	T	“	“
– South-Central California Coast DPS	T	“	<u>78 FR 77430</u>
– Southern California DPS	E	“	<u>77 FR 1669</u>
– Upper Columbia River DPS	T	<u>70 FR 52629</u>	<u>72 FR 57303</u>
– Upper Willamette River DPS	T	“	<u>76 FR 52317</u>
– Lower Columbia River DPS	T	“	<u>78 FR 41911</u>
– Middle Columbia River DPS	T	“	<u>74 FR 50165</u>
– Snake River Basin DPS	T	Not in action area	<u>11-2017</u>
– Puget Sound DPS	<u>T – 72 FR 26722</u>	<u>81 FR 9251</u>	<u>12-2019</u>
<b>Anadromous non-Salmonid Fish</b>			
Atlantic Sturgeon ( <i>Acipenser oxyrinchus oxyrinchus</i> )	<u>77 FR 5879</u>	<u>82 FR 39160</u>	-- --
– Gulf of Maine DPS	T		
– New York Bight DPS	E		-- --
– Chesapeake DPS	E		
– All DPS	T/E		
Eulachon ( <i>Thaleichthys pacificus</i> )			
–Southern DPS	<u>T – 75 FR 13012</u>	<u>76 FR 65323</u>	<u>9/2017</u>
Green Sturgeon ( <i>Acipenser medirostris</i> )			<u>8/2018</u>
– Southern DPS	<u>T – 71 FR 17757</u>	<u>74 FR 52300</u>	
Shortnose Sturgeon ( <i>Acipenser brevirostrum</i> )	<u>E – 32 FR 4001</u>	-- --	<u>63 FR 69613</u> <u>12/1998</u>
<b>Other Fish</b>			
Bocaccio ( <i>Sebastes paucispinis</i> )	<u>E – 75 FR 22276 and</u>	<u>79 FR 68041</u>	
– Puget Sound/Georgia Basin DPS	<u>82 FR 7711</u>		<u>10/2017</u>
Giant Manta Ray ( <i>Manta birostris</i> )	<u>T – 83 FR 2916</u>	Not prudent	-- --
Nassau Grouper ( <i>Epinephelus striatus</i> )	<u>T – 81 FR 42268</u>	-- --	<u>8/2018- Outline</u>
Oceanic Whitetip Shark ( <i>Carcharhinus longimanus</i> )	<u>T – 83 FR 4153</u>	Not prudent	<u>9/2018- Outline</u>
Scalloped Hammerhead Shark ( <i>Sphyrna lewini</i> )	<u>79 FR 38213</u>	-- --	-- --
– Central and Southwest Atlantic DPS	T		
– Eastern Pacific DPS	E		
Yelloweye Rockfish ( <i>Sebastes ruberimus</i> )	<u>T – 75 FR 22276 and</u>	<u>79 FR 68041</u>	<u>10/2017</u>
– Puget Sound/Georgia Basin DPS	<u>82 FR 7711</u>		
<b>Marine Invertebrates</b>			
<b>Indo-Pacific Corals</b>			



Species	ESA Status	Critical Habitat	Recovery Plan
<i>Acropora globiceps</i> Coral	<u>T – 79 FR 53851</u>	85 FR 76262 (proposed)	-- --
<i>Acropora jacquelineae</i> Coral	“	“	-- --
<i>Acropora retusa</i> Coral	“	“	-- --
<i>Acropora speciosa</i> Coral	“	“	-- --
<i>Acropora tenella</i> Coral	“	“	-- --
<i>Euphyllia paradivisa</i> Coral	“	“	-- --
<i>Isopora crateriformis</i> Coral	“	“	-- --
<i>Seriatopora aculeata</i> Coral	“	“	-- --
<b>Caribbean Corals</b>			
Boulder Star Coral	<u>T – 79 FR 53851</u>	85 FR 76302 (proposed)	
Lobed Star Coral ( <i>Orbicella annularis</i> )	“	“	-- --
Mountainous Star Coral ( <i>Orbicella faveolata</i> )	“	“	-- --
Rough Cactus Coral ( <i>Mycetophyllia ferox</i> )	“	“	-- --
Pillar Coral ( <i>Dendrogyra cylindrus</i> )	“	“	-- --
Elkhorn Coral ( <i>Acropora palmata</i> )	“	<u>73 FR 72210</u>	<u>80 FR 12146</u>
Staghorn Coral ( <i>Acropora cervicornis</i> )	“	”	””
<b>Other Marine Invertebrate</b>			
Chambered Nautilus ( <i>Nautilus pompilius</i> )	<u>T – 83 FR 48976</u>	Not prudent	-- --

The 2021 PGP’s action area overlaps with the range and designated critical habitat for Atlantic sturgeon now includes spawning habitat in portions of the Mattaponi and Pamunkey Rivers flowing through Indian Country Lands belonging to the two respective tribes. While the state of Idaho is no longer part of the action area, ESA-listed Snake River salmonids would still be exposed to PGP discharges because they must migrate through the state of Washington to reach Idaho waters. EPA will not, however, authorize discharges to the spawning and rearing waters for these species that are not within Indian Country Lands.

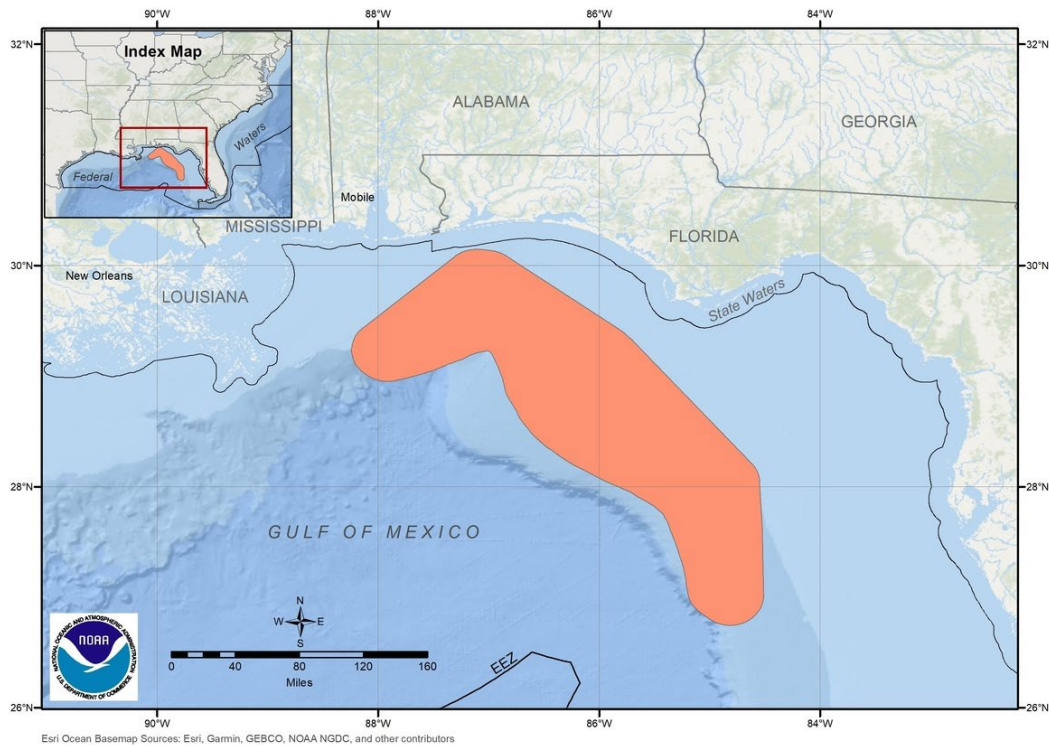
## 5.1 Recent Listings and Listing Updates, Designated and Proposed Critical Habitat

NMFS has listed additional species and designated and proposed critical habitat for protection under the ESA since issuance of the 2016 PGP. Those that have ranges overlapping with the action area include the Gulf of Mexico subspecies of the Bryde’s whale, the chambered nautilus, the oceanic whitetip shark, the giant manta ray and proposed critical habitat for the Southern resident killer whale and Caribbean and Indo-Pacific corals. NMFS also issued a rule specifying 11 DPS for green turtle in 2016.

### 5.1.1 Gulf of Mexico Bryde’s Whale

The range for the endangered Gulf of Mexico Bryde’s whale is throughout the Gulf. The species is consistently located in the northeastern Gulf of Mexico along the continental shelf break between 100 and 400 meters deep. The EPA has permitting authority over certain fossil fuel operations in Texas (see Figure 3 of NMFS’ opinion on the 2016 PGP). While many of these are along the Texas coast, the Gulf of Mexico Bryde’s whale is not expected to frequent these areas. For the past 25 years, Bryde’s whales in U.S. waters of the Gulf of Mexico have been

consistently located only in the northeastern Gulf of Mexico along the continental shelf between 100 meters and about 400 meters depth. See Figure 2. Any exposures of the Gulf of Mexico Bryde's whale to PGP-permitted discharges from these facilities are expected to be substantially diluted, microbially metabolized, or incorporated into sediments before reaching waters where the species is found. The exposures to pesticide pollutants are expected to be extremely unlikely to occur and therefore the proposed action may affect, but is not likely to adversely affect the Gulf of Mexico Bryde's whale.



**Figure 2. Map of Gulf of Mexico Bryde's whale core distribution area as of June 2019.**

### 5.1.2 Chambered Nautilus

The threatened chambered nautilus is an extreme habitat specialist that lives in close association with steep-sloped forereefs in the western Pacific Ocean (Jereb 2005, Saunders 2010). While EPA is the permitting authority for the Pacific Territories, no NOI have been submitted for PGP discharges and any discharges automatically covered under the PGP are not expected to reach habitat where this species occurs. Any exposures of the chambered nautilus to PGP discharges are expected to be extremely unlikely to occur and are therefore NLAA. The chambered nautilus is not discussed further in this opinion.

### 5.1.3 Oceanic Whitetip Shark

The oceanic whitetip shark is a truly pelagic species, generally remaining offshore in the open ocean. It is usually found offshore in the open ocean, on the outer continental shelf, or around oceanic islands in deep water greater than 184 meters (Backus et al. 1956, Strasburg 1958, Compagno 1984, Bonfil et al. 2008). Considering the distance between shore and waters where this species occurs (for example, the North West Atlantic see Figure 3) exposures to PGP discharges are expected to be diluted and degraded to the point where exposures would be insignificant and therefore the proposed action may affect, but is not likely to adversely affect oceanic white tip shark.



**Figure 3. Distance from shore where ocean depths are greater than 150 meters (Bathymetry - TNC raster derived 50 meter contours medium resolution NAD83).**

### 5.1.4 Giant Manta Ray

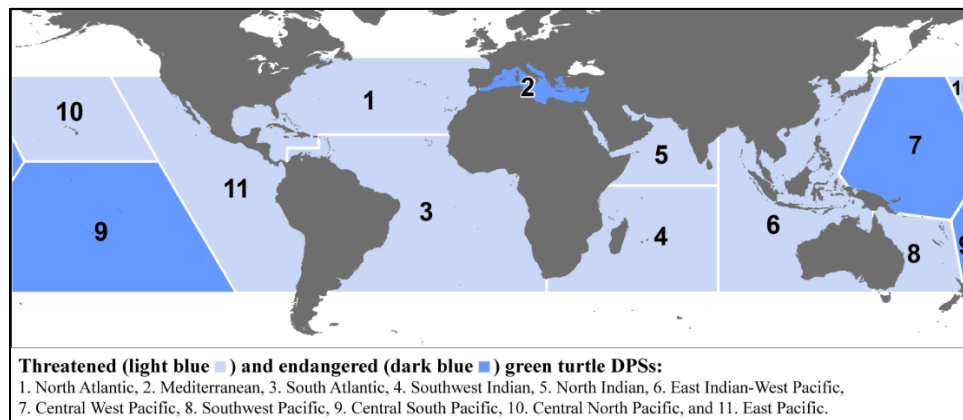
Giant manta rays are typically found offshore in the open ocean, though these animals are sometimes found around cleaning stations in nearshore reefs and estuarine waters. Biologists

from NMFS have observed giant manta ray infrequently near the entrance to San Juan Bay in Puerto Rico, particularly near channel marker buoys in San Juan Harbor. Overall, the species is not frequently reported in waters of Puerto Rico. The rarity of giant manta rays in Puerto Rico waters and their preference for deeper, offshore areas means any exposure to PGP-authorized discharges would rarely occur near Puerto Rico. Manta species were observed in Tumon Bay Marine Preserve of Guam. The coastline of Tumon Bay is populated by hotels and other resort facilities, but no marinas. Based on past permitting, it is unlikely that a PGP NOI would be submitted for discharges to Tumon Bay. Observation of manta rays during aerial surveys of Guam were infrequent, but increased slightly from 1963 to 2012 (Martin 2016). These reports are not specifically of the giant manta ray and could actually represent observations of the reef manta, which are more likely to occur close to land. Manta species were not observed in surveys of these areas conducted between 2008 and 2012 (Martin 2016). Considering that the giant manta ray is a pelagic species of manta ray and manta species have not been observed in or near waters receiving PGP-authorized discharges, exposures of giant manta ray are expected to be extremely unlikely to occur and therefore the proposed action may affect, but is not likely to adversely affect giant manta ray.

### 5.1.5 Updated Green Turtle Listing

The green turtle was initially listed under the ESA on July 28, 1978 (43 FR 32800) as endangered for breeding populations in Florida and the Pacific coast of Mexico, and threatened in all other areas throughout its range. On April 6, 2016, NMFS listed 11 DPSs of green turtles as threatened or endangered under the ESA (81 FR 20057). Eight DPSs are listed as threatened:

Central North Pacific, East Indian-West Pacific, East Pacific, North Atlantic, North Indian, South Atlantic, Southwest Indian, and Southwest Pacific. Three DPSs are listed as endangered: Central South Pacific, Central West Pacific, and Mediterranean.



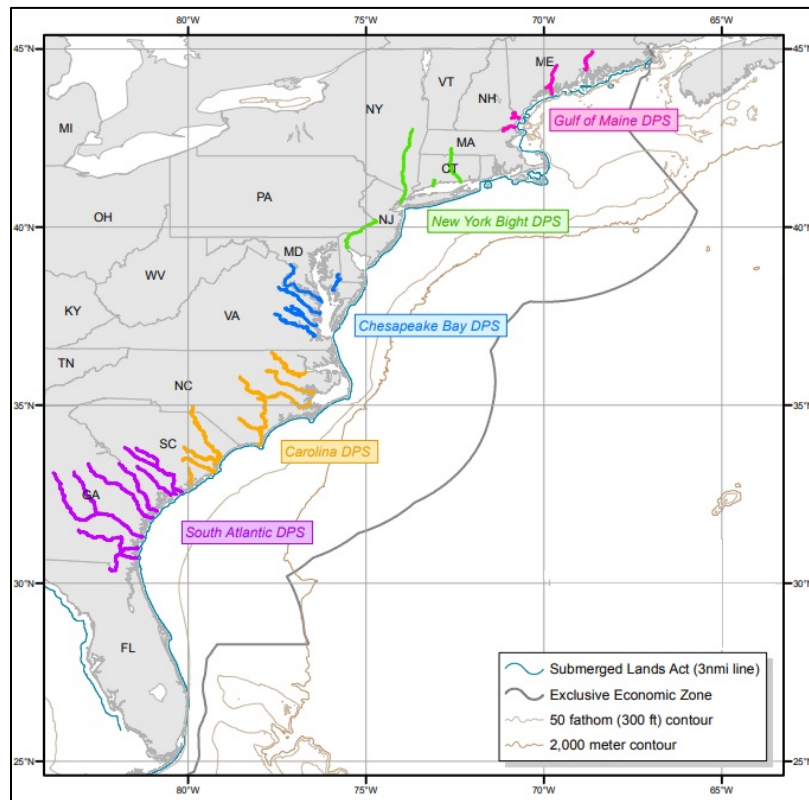
**Figure 4. Map depicting DPS boundaries for green turtles**

PGP discharges occur to habitats used by the North Atlantic, South Atlantic, East Pacific, and Central North Pacific DPS of green turtle, which are threatened, and the Central West Pacific DPS of green turtle, which is endangered. The listing change did not affect existing designated critical habitat in Puerto Rico and does not reassess the status of these populations, so the

*Integration and Synthesis* section of this opinion will therefore consider the status of the green turtle and its designated critical habitat as described in NMFS' opinion on the 2016 PGP.

### 5.1.6 Critical Habitat Designated for the Atlantic Sturgeon

NMFS finalized the proposed critical habitat for each ESA-listed DPS of Atlantic sturgeon in August of 2017 (Figure 5; 82 FR 39160). This species is highly mobile and any DPS could occur along any segment of the Atlantic coastline.



**Figure 5. General map of designated critical habitat for each DPS of Atlantic sturgeon**

The PGP authorizes discharges to waters designated as critical habitat for the threatened Gulf of Maine DPS and the endangered New York Bight and Chesapeake Bay DPSs. The following specific critical habitat designations overlap with areas where EPA has permitting authority:

- The Potomac River below Little Falls Dam in Virginia (Chesapeake DPS),
- The Connecticut River below the Holyoke Dam in Massachusetts (New York Bight DPS),
- The Merrimack River below the Essex Dam in Massachusetts (Gulf of Maine DPS),
- The Piscataqua River from its confluence with the Salmon Falls and Cocheco Rivers downstream to where the main stem river discharges at its mouth into the Atlantic Ocean, as well as the Waters of the Cocheco River from its confluence with the Piscataqua River

and upstream to the Cocheco Falls Dam, and Waters of the Salmon Falls River from its confluence with the Piscataqua River and upstream to the Route 4 Dam (Gulf of Maine DPS), and

- Mattaponi or Pamunkey river areas affected by PGP-authorized discharges associated with lands belonging to the Mattaponi or Pamunkey Tribes.

The key conservation objective for the Gulf of Maine, New York Bight, and Chesapeake Bay DPSs is to increase abundance by facilitating successful reproduction in the limited number of rivers available for spawning and, ultimately, recruitment to the marine environment. For the Carolina and South Atlantic DPSs of Atlantic sturgeon, the key conservation objective is to increase abundance by facilitating increased survival of all life stages and facilitating adult reproduction and juvenile and subadult recruitment into the adult population. The PBFs determined to be essential for Atlantic sturgeon reproduction and recruitment include (1) suitable hard bottom substrate in low salinity waters for settlement of fertilized eggs, refuge, growth, and development of early life stages; (2) transitional salinity zones for juvenile foraging and physiological development; (3) water of appropriate depth and absent physical barriers to passage; (4) unimpeded movement of adults to and from spawning sites; and (5) water quality conditions that support spawning, survival, growth, development, and recruitment. While the critical habitat designation does not identify biological features that may respond to pesticides or identify water pollution among features that may require special management considerations, the analyses in NMFS' opinion on the 2016 PGP established that pesticide discharges affecting spawning, survival, growth, development, and recruitment are of particular concern and will therefore also be addressed as impacts to critical habitat the *Integration and Synthesis* section of this opinion.

### **5.1.7 Critical Habitat Proposed for Indo-Pacific and Caribbean ESA-Listed Corals**

Critical habitat recently proposed for the Indo-Pacific ESA-listed coral species (85 FR 76262) and Caribbean coral species (85 FR 76302) includes the PBF of “marine water with levels of anthropogenically-introduced (from humans) chemical contaminants that do not preclude or inhibit any demographic function.” The spatial extent of critical habitat essentially surrounds the coast line of the United States territories in both the Caribbean and Pacific region. The implications of PGP-authorized discharges on proposed coral critical habitat are addressed in later sections of this opinion. The analyses in NMFS' opinion on the 2016 PGP established that pesticide discharges affecting spawning, survival, growth, development, and recruitment are of particular concern and will therefore also be considered impacts to critical habitat the *Integration and Synthesis* section of this opinion.

### **5.1.8 Revision to Critical Habitat Proposed for Southern Resident Killer Whale**

In September of 2019, NMFS proposed to revise the designated critical habitat for Southern Resident Killer Whale to include foraging areas along the Pacific Coast of Washington, Oregon, and California. EPA's permitting authority for these states is limited to Indian Country Lands

and, in Washington, Federal facilities and Indian Country Lands. Evaluation of pesticide applications to these waters over the 2011 and 2016 PGP permit terms identified very few herbicide applications to coastal waters and those applications that were conducted involved small areas (e.g., 0.25 acres) such that exposures would be extremely unlikely to occur. Considering that there is no reason to expect pesticide application behavior to differ over the 2021 PGP permit term, pesticide exposures in along the proposed Pacific Coast critical habitat are expected to be extremely unlikely to occur and therefore the proposed action may affect, but is not likely to adversely affect proposed designated critical habitat for the Southern resident killer whale.

## 5.2 Updates to the 2016 PGP Status of Species

This section updates Section 6.2 *Species and Designated Critical Habitat Considered in this Opinion* of NMFS' opinion on the 2016 PGP, where new information is available.

The 2016 consultation for the PGP applied the status reports and other data that were the most recent information available at the time the opinion was written. NMFS' opinion on the 2016 PGP reviewed the reasons for listing, physical description, life history, and critical habitat, where designated, for each species assessed. Those summaries are not repeated here. Further, the following species have not had status reviews since the 2016 PGP was issued:

- Pacific salmonids: nine Evolutionarily Significant Units (ESUs) of steelhead trout, nine ESUs of Chinook salmon, three ESUs of coho salmon, two ESUs of chum salmon, and two ESUs of sockeye salmon
- Atlantic sturgeon (all DPS)
- shortnose sturgeon
- Southern DPS North American green sturgeon
- Southern Pacific eulachon
- bocaccio
- yellow eye rockfish
- Nassau grouper
- leatherback turtle
- hawksbill turtle
- Kemp's ridley turtle
- Olive ridley turtle
- Green turtle (North Atlantic, South Atlantic, East Pacific, Central North Pacific DPS and Central West Pacific DPSs), and
- Indo-Pacific coral species (*Acropora globiceps*, *Acropora jacquelineae*, *Acropora retusa*, *Acropora speciosa*, *Euphyllia paradivisa*, *Isopora crateriformis*, *Orbicella annularis*, and *Seriatopora aculeata*)

For the species above, the *Integration and Synthesis* section of this opinion incorporates the status of the species and designated critical habitat as described in NMFS' opinion on the 2016 PGP. The following sections discuss those species with recent status reviews and species that have experienced new threats since the 2016 PGP opinion was issued.

### **5.2.1 The 2017–2020 North Atlantic Right Whale Unusual Mortality Event**

An unusually high number of vessel-strike and entanglement mortalities, starting in 2017 and continuing into 2020, has claimed approximately ten percent of the North Atlantic right whale population. There are fewer than 100 breeding females left. Only 22 births have been observed in the four calving seasons since 2017, less than one-third the previous average annual birth rate for the species. The best current abundance estimate available for the North Atlantic right whale stock is 428 individuals (95 percent credible interval 406-447 (NMFS 2020b)).

NMFS' opinion on the 2016 PGP concluded that the North Atlantic right whale would have insignificant exposures to PGP-authorized discharges because the species would generally not occur near enough to shore where pesticides would be applied. Given the recent unusual mortality event and potential for long range drift under the right conditions, it is necessary to reevaluate this conclusion. About 16 of the 350 2016 PGP NOI apply pesticides at or near marine waters. Annual reports submitted over the 2016 permit term indicate that the overwhelming majority of PGP applications are biological pesticides such as methoprene, bacillus, and spinosad or pyrethrins, such as sumithrin and deltamethrin. These pesticides are minimally toxic to mammals and do not accumulate in the food chain. It is reasonable to expect that dietary exposure to PGP pesticides in copepod prey would be extremely unlikely. Although whales do not have gills or drink seawater, exposures could also occur through inhalation of pesticide residue drift from the target area. Since whales swim continuously, it is extremely unlikely that they would surface nearby and become exposed to pesticide residue drift at the time or shortly after pesticide applications occur. As such, exposures to PGP discharges are expected to be extremely unlikely and therefore the proposed action may affect, but is not likely to adversely affect the survival and fitness of the North Atlantic Right Whale.

### **5.2.2 Southern Resident Killer Whale**

Despite conservation efforts prior to the 2016 status review for southern resident killer whales, the population has not grown. The overall status of the population is not consistent with a healthy, recovered population and the DPS remains in danger of extinction. The total abundance for the Southern Resident killer whale population has declined by 1 percent each year since 1999 and now includes only 74 whales (NMFS 2020a).

Since prior opinions on the PGP did not identify recovery criteria, they are provided here. The criteria for recovery and delisting require a sustained average population growth of 2.3 percent per year for 28 years, population parameters that are consistent with a healthy growing population, and actions to address threats completed. Interim downlisting criteria require an average population growth rate of 2.3 percent per year for 14 years and progress toward



addressing threats. These metrics represent sustained growth such that the species could be downlisted from endangered to threatened. Of particular importance for PGP discharges, the recovery plan for this species calls for clean-up of contaminated sites and monitoring and minimizing inputs of toxic chemicals into the whales' habitat and food chain (NMFS 2008b).

The *Integration and Synthesis* section of this opinion will consider the declining status of the Southern Resident killer whale.

### **5.2.3 Pre-spawn Mortality of Coho Salmon**

Recent work has identified the cause of pre-spawn mortality in coho salmon. The toxicity of urban stormwater is well documented (Deering et al. 2004, McCarthy 2008, Boehler et al. 2017, Young et al. 2018). Coho salmon are uniquely sensitive to urban runoff. Urban runoff has resulted in acute mortality syndrome in coho salmon of the Pacific Northwest for decades (Scholz et al. 2011, McIntyre et al. 2018, Chow et al. 2019). The syndrome is a pattern of rapid mortality occurring concurrent with stormwater events in adult fish returning to freshwaters to spawn. In the most highly urbanized areas, the syndrome results in the loss of 40 to 90 percent of returning fish. Leachates from tire tread wear particulates were identified as an important source of the toxicants causing mortality in fish. Recent monitoring identified occurrence of toxic concentrations of a transformation product of an antioxidant chemical used in the production of tires (Tian et al. 2020).

The *Integration and Synthesis* section of this opinion will consider this additional stressor impact on ESA-listed coho salmon.

### **5.2.4 Atlantic Salmon, Gulf of Maine DPS**

In 2019, the USFWS and NMFS jointly released a recovery plan with the goal of enabling the species to maintain self-sustaining, wild populations with access to sufficient suitable habitat in three freshwater recovery units and ensure that necessary management options for marine survival of the species are in place (NMFS and USFWS 2019). This was integrated into the five-year status review released by NMFS and FWS in November of 2020 (NMFS and USFWS 2020a). Ultimately the Services seek to reduce or eliminate all threats that, either individually or in combination, pose a risk of endangerment to the DPS. The major threats to Atlantic salmon survival and recovery are low marine survival, the direct and indirect effects of dams and road stream crossings, the West Greenland harvest, and climate change.

The 10-year average abundance within each of the three salmon habitat recovery units is less than 100 natural spawners. Of the eight locally adapted populations that remain in the Gulf of Mexico DPS, seven are supported by conservation hatcheries that act to buffer extinction risk. The eighth, the Ducktrap River, is at very high risk of extirpation. With naturally reared populations being very low, the geometric mean population growth rates have been, as can be expected, highly variable. Given the high degree of variability in the population growth rates and the very low population abundances of naturally reared fish, population trajectories will need to be monitored very carefully.

Recovery criteria for downlisting the Gulf of Maine DPS of Atlantic salmon from endangered to threatened requires total annual returns of at least 1,500 adults originating from wild origin, or hatchery stocked eggs, fry or parr spawning in the wild, with at least two of the three freshwater recovery units having a minimum annual escapement of 500 naturally reared adults. Among those recovery units that have met or exceeded the abundance criterion, the population has a positive mean growth rate greater than 1.0 in the preceding 10-year period and the habitat includes a minimum of 7,500 units of accessible and suitable spawning and rearing habitats capable of supporting the offspring of 1,500 naturally reared adults. Delisting of the Gulf of Maine DPS will require both habitat protection and restoration at significant levels. Delisting criteria require a self-sustaining annual escapement of at least 2,000 wild origin adults in each recovery unit, for a DPS-wide total of at least 6,000 wild adults. Delisting would require that each recovery unit have a positive mean population growth rate of greater than 1.0 in the preceding 10-year period and self-sustaining population, whereby the total wild population in each Salmon Habitat Recovery Unit has less than a 50-percent probability of falling below 500 adult wild spawners in the next 15 years based on population viability analysis projections. Delisting of the DPS also requires that sufficient suitable spawning and rearing habitat for the offspring of the 6,000 wild adults is accessible and distributed throughout the designated Atlantic salmon critical habitat, with at least 30,000 accessible and suitable Habitat Units in each recovery unit, located according to the known migratory patterns of returning wild adult salmon (NMFS and USFWS 2019).

The *Integration and Synthesis* section of this opinion will consider the declining status of Gulf of Maine DPS of Atlantic salmon.

### **5.2.5 Loggerhead Turtle, North Pacific DPS**

According to the 2020 status review, the North Pacific Ocean loggerhead turtle DPS continues to meet the definition of an endangered species because it is in danger of extinction throughout its range as a result of numerous factors. The greatest threats are caused by fisheries bycatch, which reduces abundance, and climate change, which reduces productivity. Other threats include loss and modification of habitat, overutilization, and predation. These threats are reflected in the low abundance of nesting females. Nesting appears to be increasing; however, relatively few females return to nest on a regular basis, raising concern regarding the impact of threats on the survival of mature females and thus the resilience and recovery of the DPS (NMFS and USFWS 2020b).

The *Integration and Synthesis* section of this opinion will consider the potentially declining status of North Pacific Ocean DPS of loggerhead turtles.

### **5.2.6 Disease and Hurricane Impacts on Caribbean Corals**

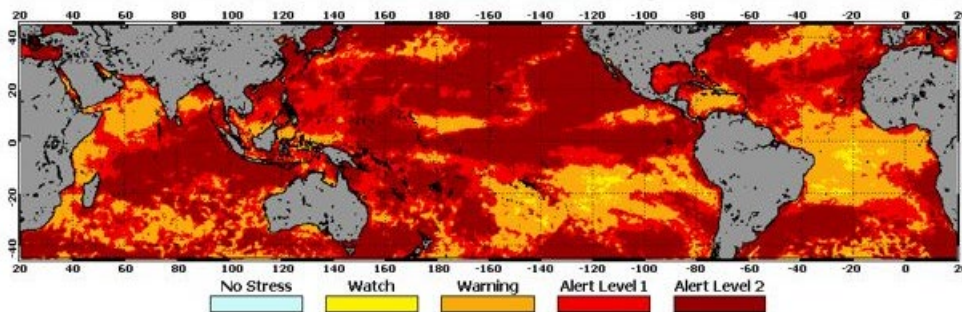
Since 2014, coral reef habitats worldwide have been subject to elevated ocean surface temperatures (Figure 6) precipitating a prolonged global bleaching event extending into early 2017 (Hughes 2017, NESDIS 2017). In addition, the 2017 western Atlantic hurricane season was unusually intense, with four hurricanes over a period of less than two months. Hurricanes Harvey

(August 25, category three) and Nate (October 4, category one) struck in the Gulf of Mexico and the category hurricanes Irma (August 30, category 5) and Maria (September 16, category 4) struck Florida and the Caribbean. The hurricanes churned coastal sediments into the water column and torrential rain carried sediments in runoff from land (Hernández et al. 2020).

Post-hurricane assessments found that staghorn coral and boulder star coral were the most severely impacted ESA-listed coral species. These species are major contributors to nearshore reefs in the Caribbean that provide coastal protection (Viehman 2020). An assessment of data collected between 2014 and 2017 rate the overall condition of Puerto Rico coral reefs after monitoring and restoration efforts as “fair” (Alvarez et al. 2020). Recovery outlines have been developed for ESA-listed Indo-Pacific coral species and the ESA-listed Caribbean coral species as interim guidance to direct recovery efforts until full plans may be developed (NMFS 2015, 2016).

More recently Stony Coral Tissue Loss Disease (SCTLD) is a rapidly spreading hard coral disease that was first reported in Florida in 2014. The disease has been documented as affecting over 20 species of hard corals in the Caribbean with pillar coral being one of the species that appears to be most vulnerable to the disease. The disease was reported in Culebra, Puerto Rico in the winter of 2019/2020, but occurrences in other parts of Puerto Rico are not yet confirmed (Landsberg et al. 2020).

The implications of hurricanes, bleaching, and disease on ESA-listed Caribbean coral species will be considered in the *Integration and Synthesis* section of this opinion.



**Figure 6. Reef Watch satellite coral bleaching alert area January 2014-December 2016.**

## **6 UPDATES TO THE ENVIRONMENTAL BASELINE**

The “environmental baseline” includes: “the past and present impacts of all Federal, State, or private actions and other human activities in an action area, the anticipated impacts of all proposed Federal projects in an action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process.” The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency’s discretion to modify are part of the environmental baseline (50 CFR §402.02). This includes discharges and activities authorized by the administratively continued 2016 PGP, and other activities authorized by the EPA (e.g., NPDES permits, cooling water intake, air emissions, and the cleanup and management of hazardous waste) that have undergone or are in the process of completing ESA section 7 consultations. The purpose of the environmental baseline is to describe the condition of the ESA-listed species and designated critical habitat in the action area without the consequences caused by the proposed action.

NMFS does not expect that the overarching drivers contributing to the environmental baseline within EPA’s action area for the 2021 PGP (e.g., example, land and water use, bycatch in fishing gear, and pollutant sources) have changed substantially since issuing the 2016 PGP. In addition to the species status updates described in section 5, this section updates the Environmental Baseline within the action area of the 2016 PGP biological opinion (Section 7) with information from the Clean Water Act 305(b) assessments overlapping with the action area for this opinion. The Clean Water Act requires states and territories to assess water quality every two years under 305(b) and identify waters that are impaired under 303(d) and in need of restoration. Restoration is achieved by establishing the maximum amount of an impairing pollutant allowed in a waterbody, or total maximum daily load (TMDL). These assessments are sent as an integrated report every even numbered year to EPA, which must approve of each impaired waters’ listing. As a result, many of the most recent state assessments were not finalized as of December 2020. The summary in this environmental baseline section includes integrated water quality report assessments finalized by EPA since the 2016 PGP was issued. This section also examines the implications of consequential climatic events over the 2016 PGP permit term: the 2017 hurricane seasons and 2020 wildfire season. These action area-specific baseline descriptions are summarized by regions for East Coast, Puerto Rico, Texas, the West Coast, and the Pacific Territories.

### **6.1 East Coast**

Specific major rivers of the conterminous Eastern United States are the only freshwaters of concern for this opinion because, unlike the salmonids of the Pacific Northwest, the ESA-listed Atlantic sturgeon and shortnose sturgeon do not use streams and other backwaters. The rivers of concern within the action area are based on the NMFS’ Greater Atlantic Region section 7 mapper data for Atlantic sturgeon designated critical habitat. While the Atlantic sturgeon was

listed for protection under the ESA in 2011, critical habitat for the species was designated in 2017, one year after the 2016 PGP was issued. The rivers of concern include the:

- Piscataqua River in New Hampshire, including critical habitat from its confluence with the Salmon Falls and Cocheco Rivers downstream to where the main stem river discharges at its mouth into the Atlantic Ocean
- Cocheco River in New Hampshire, including critical habitat from its confluence with the Piscataqua River and upstream to the Cocheco Falls Dam
- Salmon Falls River in New Hampshire, including critical habitat from its confluence with the Piscataqua River and upstream to the Route 4 Dam
- Merrimack River in Massachusetts, including critical habitat from the Essex Dam (also known as the Lawrence Dam) downstream to where the main stem river discharges at its mouth into the Atlantic Ocean
- North River in Massachusetts
- Taunton River of Massachusetts
- Thames River in Connecticut because the Mohegan Reservation is located on its shores
- Connecticut River in Massachusetts, including critical habitat from the Holyoke Dam downstream to where the main stem river discharges at its mouth into Long Island Sound for Atlantic sturgeon, and, for the landlocked shortnose sturgeon, from Turners Falls to the Holyoke Dam
- Delaware River
- Potomac River in Washington D.C., including critical habitat from the Little Falls Dam downstream to where the main stem river discharges at its mouth into the Chesapeake Bay

The EPA approved New Hampshire's 2018 303(d) list for freshwaters in February of 2020. Prior to the 2018 assessment, the Cocheco River was listed as impaired due to polychlorinated biphenyls (PCBs). This listing was found to be in error and the water is no longer considered impaired. Even so, the Cocheco and associated tributaries remain impaired by polycyclic aromatic hydrocarbons (PAHs), legacy organochlorine pesticides, lead, aluminum, iron, pH, low dissolved oxygen, and other stressors contributing to the impairment of the biological community (e.g., flashiness). The Piscataqua River continues to be impaired by excess nitrogen, dioxin, mercury, PCBs, light penetration, and stressors resulting in an impaired estuarine biological community. Approved TMDLS for fecal coliform and enterococcus are now in place for these Piscataqua River impairments. For the Salmon Falls River, impairments include impaired biological communities, indicators of eutrophication (chlorophyll-a, dissolved oxygen and oxygen saturation, and total nitrogen), dioxin, mercury, PCBs, and pH. Approved TMDLS for mercury and dissolved oxygen are now in place for certain segments of the Salmon Falls

River. Approved TMDLs are also in place for enterococcus, *Escherichia coli*, fecal coliform, and non-native aquatic plant impairments. The 2018 assessment did not include marine waters, but the draft 303(d) list adds assessment zones located in Great Bay impaired by eutrophication indicators chlorophyll-a and total nitrogen.

The EPA approved Massachusetts's 2016 303(d) list in January of 2020. The 2016 assessment identified additional *Escherichia coli* impairments in segments of the Merrimack, Taunton, and Connecticut Rivers. Indicators of sewage and eutrophication impairments were also identified for 13 harbor and bay segments. New enterococcus, nitrogen, and estuarine community impairments were identified for 14 waters with existing TMDLs, and these impairments were incorporated into the existing TMDL. New TMDLs were established for eight harbor and bay segments: six for fecal coliform, one for nitrogen, and one for an estuarine biological community impairment. Restoration activities resulted in use attainment for the sediment impairments (total suspended solids and turbidity) in Dorchester Bay. The fecal coliform impairments of Hyannis Harbor and Little Pleasant Bay were withdrawn because new assessment methods indicated they were not actually impaired. Water quality standards were also attained for fecal coliform, eutrophication indicators, total suspended solids, and estuarine biological community impairments of five other harbor and bay segments, but the reason for attainment was not specified.

For Indian country in Virginia, the Mattaponi River Watershed TMDL Implementation Plan addresses actions necessary to reduce excessive bacteria levels (Virginia Department of Environmental Quality and Streams Tech 2020). While the watershed is 64.5 percent forested and 11.3 percent wetland, it includes 7.6 and 7.7 percent cropland and pasture, respectively. The TMDL determined that point sources (i.e., publically owned treatment works) were found to contribute less than two percent of bacterial load. About three quarters of the residences in the watershed have septic systems and about 20 percent of those are greater than 40 years old. Bacterial load reductions are expected to be accomplished by voluntary management measures including exclusion fencing, vegetative cover, stormwater and sediment control measures, and septic waste management measures. The Pamunkey River TMDL Action Plan also addresses bacterial impairments, but is focused on sources from the urbanized area of the watershed (Department of Public Works 2021). Bacterial load reduction measures include septic system pump out, sanitary sewer overflow programs, and pet waste management.

Washington, D.C. assessed nearly all its waters for the 2016 reporting year, and these waters were all identified as impaired and in need of a TMDL. The top five impairments for rivers and streams (39 miles) were PCBs, pathogens, zinc, copper, and turbidity. For impaired bays and estuaries (5.9 square miles), the top five impairments were PCBs, *Escherichia coli*, turbidity, pH, and dieldrin; DDT and its metabolites, chlordane, heptachlor epoxide, and PAHs tied for fifth place. A TMDL addressing the fecal coliform impairment of Washington's Tidal Basin has been established since the 2014 reporting year, but the other impairments for the basin (i.e., legacy organochlorine pesticides, PCBs, PAHs, and pH) are still in need of a TMDL.

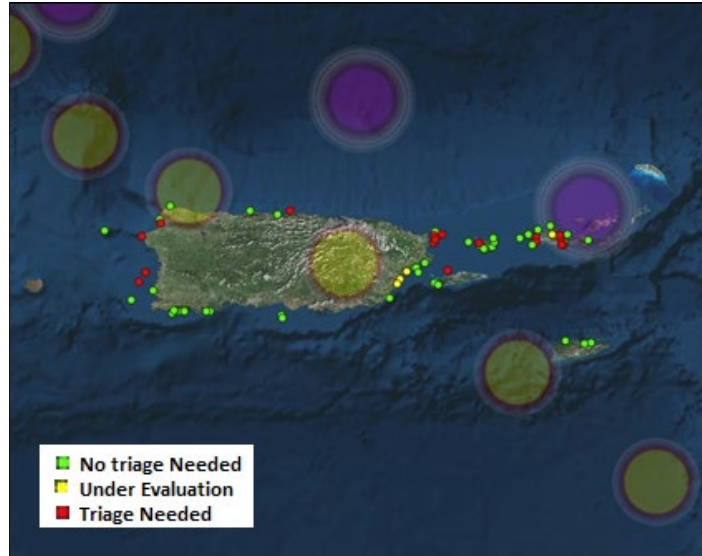
## **6.2 Puerto Rico**

Puerto Rico also assessed most of its waters for the 2016 reporting year and identified recovery of designated uses for 28 miles of previously impaired coastal shoreline. Since the 2014 reporting year, indicator bacteria TMDLs were completed for Caño Merle and the San Juan Bay Estuary System, and 12 coastal/estuarine waters attained their designated uses. With the exception of the San Juan Bay Estuary, the recovered impairments were all dissolved oxygen. For San Juan Bay, the recovered impairments were for cadmium, copper, cyanide, lead, nitrate/nitrite, and surfactants. However, the reason for the nitrate/nitrite recovery was due to a change in the criteria, and the reason for the remaining impairment recoveries is not identified. The top five current impairments for Puerto Rico's bays and estuaries (12.6 miles) are fecal coliform, low dissolved oxygen, copper, turbidity, and pH. A total of 442.2 miles of coastal shoreline are impaired by turbidity, low dissolved oxygen, pH, enterococcus bacteria, and temperature. The sources for these impairments are associated with sewage and urban/marina runoff.

### **6.2.1 Hurricanes in 2017**

Major hurricanes have caused significant losses in coral cover and changes in the physical structure of many reefs in Puerto Rico, as well as loss or damage to seagrass beds from blowouts and sediment movement. Tropical storms and hurricanes can result in severe flooding, leading to significant sediment transport to nearshore waters from terrestrial areas, as well as shifting of marine sediments. In addition to affecting sessile benthic organisms such as ESA-listed corals, changes in the structure of the reef affect species like turtles, in particular greens and hawksbills that use reef habitats for refuge and foraging. In-water habitat for green and hawksbill turtles is temporarily or permanently lost or degraded depending on the magnitude of the storm.

Based on NOAA hurricane data and data from the Federal Emergency Management Agency, there have been a total of 11 hurricanes and tropical storms that have affected Puerto Rico between 1975 and 2017. Hurricanes Irma and Maria passed through the Caribbean in September 2017. Many portions of Puerto Rico were relatively unaffected by Hurricane Irma, although the storm did cause damage to Vieques, but Hurricane Maria affected all of Puerto Rico. The islands are still recovering from the effects of the storms, but in-water assessments of habitats indicate that some coral areas suffered only minor damage from the storm while other areas suffered significant damage (Figure 7).



**Figure 7. Map showing tracks of Hurricanes Irma (large purple dots) and Maria (large yellow dots) in area where Puerto Rico is located and results of coral surveys conducted through 2018 (NOAA 2017a).**

In other areas, triage of affected corals was performed to stabilize colonies affected by the storms and work on reef restoration is still on going. Seagrass beds also suffered varying levels of effects depending on their location around the islands in relation to currents, waves, and storm surge. Reports of impacts from Hurricanes Irma and Maria on coastal areas of Puerto Rico indicate that beaches in many parts of the island and outlying islands such as Culebra and Vieques were significantly affected by erosion associated with storm surge (E. Díaz, PRDNER, pers. comm. to L. Carrubba, NMFS, October 12, 2017). There were also reports of numerous vessel groundings, contamination of nearshore waters due to flooding of terrestrial areas including wastewater treatment plants, transport of debris to nearshore waters and debris accumulations where in-water structures were damaged, and storm damage to coral and seagrass habitats (E. Díaz, PRDNER, pers. comm. to L. Carrubba, NMFS, October 12, 2017). Some benthic habitats that did not suffer physical impacts from the hurricanes are not fully recovering, apparently due to the longer-term effects of contaminant and debris transport to nearshore waters associated with flooding caused by the storm.

While the Atlantic 2020 hurricane season was intense, no hurricanes made landfall in Puerto Rico. NMFS looked for, but did not find, any information suggesting reefs surrounding Puerto Rico were physically harmed. However, considering the torrential rains that did impact Puerto Rico during this most recent hurricane season, it is likely that pollutants were discharged into the sea from numerous sources.

### **6.3 Texas**

The EPA approved Texas' 2020 integrated water quality assessment in May of 2020. No new costal water impairments were added or removed from the Texas 303(d) list of impaired waters. NMFS' opinion on the 2016 PGP used the 2010 integrated assessment report because data for subsequent years were not accessible. Coastal water impairments identified in the current 303(d)



list that were identified during the 2014, 2016, and 2018 reporting years include copper (n=4), bacteria in recreational waters (n=4), PCBs in fish tissues (n=2), and depressed dissolved oxygen (n=1).

A number of hurricanes have affected Texas since the 2016 PGP was issued. In 2017 Hurricane Harvey's category 4 winds caused massive structural damage and stalled over Texas for several days soaking a 29,000 square mile area with at least 20 inches of rain over 7 days (NOAA 2017b). The Atlantic 2020 hurricane season brought a record number of hurricanes. Hurricane Hanna, a category 1 hurricane based on wind speed, made landfall in south Texas on July 25. What makes this storm remarkable was the torrential rainfall exceeding one foot in some areas (NOAA 2020). In September, the storm surge from Hurricane Beta flooded much of coastal Texas (NOAA 2020). NMFS could not find surveys of the effects hurricanes on coastal and near shore waters of Texas.

#### **6.4 West Coast**

The state of Washington's 2012 integrated water quality assessment was approved by EPA in 2016 (Opalski 2016). The 2012 integrated list identifies 303 freshwater segments that have been removed from the state 303(d) list due to attaining water quality standards (n=116), being subject to a plan to achieve water quality standards through a TMDL or other pollutant control strategy (n=156), or for which the state determined that the data no longer met revised threshold requirements for non-attainment (n=31). Impairments in Washington's 2012 303(d) list total 3,571 freshwater segments. This includes 1,622 waters listed for the first time. The state also identified 77 marine and estuarine waters as impaired, with primary impairments being fecal coliform, dissolved oxygen, invasive exotic species, sediment toxicity, PCBs, and PAHs in fish tissue. The top five impairments in Washington freshwaters are temperature, dissolved oxygen, bacteria, pH, and PCBs in fish tissue (DEQ 2020).

The EPA approved most of Oregon's proposed 2012 303(d) listings and delistings in December of 2016 (ODEQ 2020). Thirty-two waters were recommended for removal from the 303(d) list. Most removals were waters that had been identified as impaired by manganese and/or beryllium because there are no standards for these elements. Eleven waters were proposed for removal because they had attained criteria. Among the remaining waters recommended for delisting are those that were inactive due to low priority under insufficient program funding (n=9), those for which criteria or designated use changed (n=5), insufficient data with data collection prioritized (n=3), or those that were subject to a plan to achieve water quality standards through a TMDL or other pollutant control strategy (n=4). The integrated water quality assessment also identified 84 additional waters for listing, with the top five impairments being impaired biological community, dissolved oxygen, lead, mercury, and copper.

Data from California's 2016 integrated report identified nine additional impaired waters in Indian Country Lands where EPA is still the permitting authority. The top five impairments identified for these areas were aluminum, indicator bacteria, toxicity, temperature, and sediment. While the assessment did not identify any waters which had a TMDL developed since the last

reporting cycle or attained their designated uses, only 33 percent of California's rivers and streams and 42 percent of its bays and estuaries were assessed for the 2016 reporting cycle.

#### **6.4.1 Wildland Fire (West Coast)**

NMFS' opinion on the 2016 PGP discussed wildland fires in section 6.1.8. Fires that are allowed to burn naturally in riparian or upland areas may benefit or harm aquatic species, depending on the degree of departure from natural fire regimes. These beneficial and harmful effects of wildfire are discussed in the NMFS' opinion for the 2016 PGP. The intensity and extent of wildfires appear to be increasing over time, suggesting a departure from natural fire regimes. In the 1990s, the average annual acreage burned by wildfire was 3.3 million acres in an average of 78,600 individual fires. Since 2000, the average annual acreage burned by wildfire was 6.9 million acres, three times the area burned in the 1990s. The 2015 fire season was the largest on record, with 10.1 million acres burned. As of November 2, 2020, over 47,500 wildfires have burned nearly 8.7 million acres this year (CRS 2020). Fire retardants used to fight wildfires risk polluting water and adversely affecting ESA-listed species (NMFS 2019).

#### **6.5 Pacific Territories**

Guam assessed 2.4 percent of its bays and estuaries (22.3 square miles assessed) and 14 percent of the coastal shoreline (16.6 miles assessed). While enterococcus bacteria TMDLs were developed for 25 beaches, no previously impaired waters were identified as attaining their designated use in the 2016 reporting period. Enterococcus bacteria TMDLs are still needed for about 16 miles of beach, and 0.7 miles of beach need a TMDL for PCBs in fish tissue. About 12 square miles of Guam's bays and estuaries are impaired by PCBs in fish tissue, and Tumon Bay was identified as impaired by antimony, tetrachloroethylene, trichloroethylene, arsenic, dieldrin, and chlordane. While sources for these impairments were not identified in Guam's 2016 integrated assessment report, the presence of the legacy contaminants PCBs, dieldrin, and chlordane does not suggest current activity that would be subject to the PGP.

American Samoa assessed 78 percent of its coastal shoreline (124 linear miles) during its 2016 reporting year. Enterococcus bacteria TMDLs were developed for 41 beaches and the original listing of one beach as impaired by arsenic was determined to be incorrect. Overall enterococcus bacteria impairs 58.6 miles of coastline and impaired biological communities (specific cause unknown) occur along 41 miles of coastline. Sources of pollutants in these waters were identified as multiple unspecified nonpoint sources and sediments contaminated with legacy pollutants.

The Northern Marianas Islands assessed water quality along 235.3 miles of coastal shoreline and determined that 89.5 miles were impaired and required a TMDL for phosphate. Specific impairments, in addition to phosphate, include 83.3 miles impaired by enterococcus bacteria, 53 miles exhibiting impaired biological communities, 25.6 miles impaired by low dissolved oxygen, 9.9 miles with pH impairments, and less than five miles impaired by mercury, copper, and lead. Pollutant sources were identified as septic systems, livestock operations, and military bases.

## 6.6 Climate Change

The globally-averaged combined land and ocean surface temperature data, as calculated by a linear trend, show a warming of approximately 1.0°C from 1901 through 2016 (Hayhoe 2007). The IPCC Special Report on the Impacts of Global Warming (2018) noted that human-induced warming reached temperatures between 0.8 and 1.2°C above pre-industrial levels in 2017, likely increasing between 0.1 and 0.3°C per decade. Warming greater than the global average has already been experienced in many regions and seasons, with most land regions experiencing greater warming than over the ocean (Allen et al. 2018). Annual average temperatures have increased by 1.8°C across the contiguous United States since the beginning of the 20th century with Alaska warming faster than any other state and twice as fast as the global average since the mid-20th century (Jay et al. 2018). Global warming has led to more frequent heatwaves in most land regions and an increase in the frequency and duration of marine heatwaves (Hoegh-Guldberg et al. 2018). Average global warming up to 1.5°C as compared to pre-industrial levels is expected to lead to regional changes in extreme temperatures, and increases in the frequency and intensity of precipitation and drought (Hoegh-Guldberg et al. 2018).

The Atlantic Ocean appears to be warming faster than all other ocean basins except perhaps the southern oceans (Cheng et al. 2017). In the western North Atlantic Ocean, surface temperatures have been unusually warm in recent years (Blunden and Arndt 2016). Since the early 1980s, the annual minimum sea ice extent (observed in September each year) in the Arctic Ocean has decreased at a rate of 11 to 16 percent per decade (Jay et al. 2018). Further, ocean acidity has increased by 26 percent since the beginning of the industrial era (IPCC 2014) and this rise has been linked to climate change. Climate change is also expected to increase the frequency of extreme weather and climate events including, but not limited to, cyclones, tropical storms, heat waves, and droughts (IPCC 2014).

## 7 EFFECTS OF THE ACTION

“Effects of the Action” are defined as all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur (50 CFR §402.02). A conclusion of “reasonably certain to occur” must be based on clear and substantial information, using the best scientific and commercial data available. Information supporting such a conclusion includes existing plans for the activity and the economic, administrative, and legal requirements necessary for the activity to go forward (see 50 C.F.R. §402.17). Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 CFR §402.02).

The toxicity of PGP-eligible pesticides and the framework of the 2021 PGP, the use patterns covered, eligibility, NOI and annual reporting requirements, have not changed from the 2016 PGP. The effects analyses in NMFS’ opinion on the 2016 PGP are thus remains the same for the 2021-2026 PGP permit term. The risk analysis in Section 8.1 of NMFS’ 2016 opinion concluded that:

*Taking into consideration that: (1) the composition, timing, frequency and location of discharges for use patterns eligible for coverage under the 2016 PGP are unknown for a majority of the discharges to be authorized, (2) previous NMFS opinions have found jeopardy and adverse modification of designated critical habitat on several of pesticides used under PGP-eligible use patterns, and (3) the BE analyses included RQs<sup>5</sup> that were many orders of magnitude greater than the LOC<sup>6</sup> EPA uses to evaluate exposures, NMFS concludes that:*

- *Pesticide discharges under the four use patterns eligible for coverage under the PGP will result in exposures to toxicants that will affect the survival and fitness of individuals through:*
  - *direct mortality*
  - *reduced growth*
  - *altered behavior*
  - *reduced fecundity (i.e., reduced reproductive output or offspring survival)*

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<sup>5</sup> RQ = Risk Quotient: The estimated pesticide exposure divided by the LC50 selected as the assessment threshold for that pesticide. An RQ is a useful screening reference to draw attention to conditions that suggest adverse effects would occur. Note that RQs do not capture the variation around LC50 estimates or the depth and quality of the data available for an assessment.

<sup>6</sup> LOC = Level of Concern: For nontarget aquatic animals, a risk quotient greater than 0.5 warrants concern. For threatened and endangered animals, a risk quotient of greater than 0.05 is of concern.

- *Pesticide discharges under the four use patterns eligible for coverage under the PGP will result in exposures to toxicants that will affect the survival and fitness of individuals through:*
  - *reduction in extent of inhabitable area/avoidance*
  - *reduction in prey species*
- *Pesticide discharges under the four use patterns eligible for coverage under the PGP will result in adverse effects to designated critical habitat features that are essential to the conservation of the species.*

The rationale for the prior PGP jeopardy determinations was that the exact locations, frequencies, and types of discharges to be made under the 2016 PGP cannot be known, specific discharges, in particular discharges resulting from emergency pesticide applications, potentially expose individuals of an ESA-listed species at a time, location, and intensity having dire consequences for the population and species. Under such circumstances, NMFS must give species the benefit of the doubt. This rationale has not changed in the 2021 PGP.

## **7.1 Updates to Effects of the Action Under the 2021 PGP**

This assessment considers effects to those species and designated critical habitat that NMFS determined were likely to be adversely affected by the discharges authorized by the 2016 PGP and to critical habitats proposed for ESA-listed coral. These changes were to the action area and permit implementation (e.g., ESA Eligibility Certification, Electronic Reporting). The Integration and Synthesis (section 9) of this opinion integrates the updates to the status of the species and environmental baseline in this opinion with the assessment of the effects of changes to the 2021 PGP.

### **7.1.1 Effects Caused by Changes to the Action Area**

Idaho is no longer part of the action area with the exception of Indian lands. Indian lands in Virginia are now part of the action area. While the action area for the PGP changed when Idaho acquired the authority to administer its NPDES program, EPA is still the permitting authority for Indian lands in Idaho. The Nez Perce Reservation includes just over 3,100 square kilometers within the 53,000 square kilometers of accessible watersheds designated as critical habitat for Chinook (Snake River fall-run ESU and Snake River spring/summer-run ESUs) as well as Steelhead (Snake River Basin DPS) within the state of Idaho. In addition, to reach their designated critical habitat for spawning, Snake River salmonids must migrate through Washington to reach their spawning habitats. Thus, the effects analysis in section 8 of NMFS' opinion on the 2016 PGP occurring in Idaho still applies. Exposures to discharges authorized under the PGP is likely to adversely affect the survival and fitness of Chinook (Snake River fall-run ESU and Snake River spring/summer-run ESUs) as well as Steelhead (Snake River Basin DPS) within the state of Idaho.

### **7.1.2 Changes in Effects of the 2021 PGP Due to Recently Designated or Proposed Critical Habitat**

Sections 5.1.6 and 5.1.7 describe critical habitat designated for Atlantic sturgeon and proposed for Caribbean and Indo-Pacific ESA-listed corals, respectively. While the PBFs of both critical habitats do not specify “waters free from pesticide exposures,” pesticide residues factor into the conservation value of both habitats.

NMFS’ opinion on the 2016 PGP assessed effects on critical habitat proposed for Atlantic sturgeon, but the action area for that consultation did not include Indian lands in Virginia. Thus the amount of designated critical habitat now includes the Mattaponi or Pamunkey River areas affected by PGP-authorized discharges. While the critical habitat designation does not identify biological features that may respond to pesticides or identify water pollution among features that may require special management considerations, it does specify *water quality conditions that support spawning, survival, growth, development, and recruitment*. The analyses in NMFS’ opinion on the 2016 PGP established that pesticide discharges affect spawning, survival, growth, development, and recruitment. This is of particular concern because a number of the rivers designated as critical habitat for the Atlantic sturgeon are spawning waters, so sensitive life stages are expected to be present. The *Effects of the Action* analyses for freshwater fish in Section 8 of NMFS’ opinion on the 2016 PGP may be applied to critical habitat designated for Atlantic sturgeon. Discharges authorized under the 2021 PGP are likely to adversely affect water quality conditions that support spawning, survival, growth, development, and recruitment for Atlantic Sturgeon.

Proposed critical habitat for the Indo-Pacific and Caribbean ESA-listed corals include the physical feature: “*marine water with levels of anthropogenically-introduced (from humans) chemical contaminants that do not preclude or inhibit any demographic function.*” Section 8 of NMFS’ opinion on the 2016 PGP included an analysis indicating that exposure of ESA-listed coral to PGP discharges would likely result in toxic effects, such response would therefore be expected to influence demographic function.

### **7.1.3 Influence of Recent Toxicity Data on the Effects of the 2021 PGP**

Comparison of data entered into EPA’s Ecotoxicology knowledgebase (ECOTOX) after EPA issued the 2016 PGP against data that were available in ECOTOX for consultation did not identify any information that would change the risk quotients evaluated for the 2016 consultation on the PGP. Toxicity thresholds for the same species exposed for the same duration were either greater than or within an order of magnitude of thresholds used in the 2016 analysis.

### **7.1.4 Influence of Changes in Permit Implementation on the Effects of the 2021 PGP**

Changes made to EPA’s implementation of the PGP include the removal of Idaho from the action area and the replacement of EPA’s eNOI system with EPA’s NPDES eReporting Tool (NeT) when preparing and submitting NOI, notices of termination, and annual reports. Elimination of Idaho from permit coverage substantially reduced the number of NOI submitted

under the PGP. A total of 139 NOI were filed in Idaho for the 2016-2021 PGP permit term. The removal of Idaho from the action area reduces the number of NOI filed in states where NMFS' ESA-listed species occur from 275 to 128. Adoption of EPA's NeT reporting tool does not affect the scope, stressors, overlap and responses of listed resources, or adequacy of controls. Because the NOI information collected in the NeT system does not differ from the original system, the change does not affect monitoring and feedback or compliance.

## 7.2 Summary: Effects of the Action under the 2021 PGP

Taken together, the analyses in sections 7.1.1 through 7.1.4 demonstrate that the effects of the action for the 2021 PGP are little changed from the effects of the action under the 2016 PGP. The toxicity of the pesticides potentially used have not changed and neither have the species potentially exposed. The change in action area under the PGP added the Pamunkey River portion of designated critical habitat of Atlantic sturgeon. In addition, NMFS has recently proposed critical habitat for marine waters where ESA-listed corals occur in the Atlantic/Caribbean and Pacific. Consistent with Section 8.1 of NMFS' 2016 opinion, NMFS' concludes the following for the 2021 PGP:

*Taking into consideration that: (1) the composition, timing, frequency and location of discharges for use patterns eligible for coverage under the 2016 PGP are unknown for a majority of the discharges to be authorized, (2) previous NMFS opinions have found jeopardy and adverse modification of designated critical habitat on several of pesticides used under PGP-eligible use patterns, and (3) the BE analyses included RQs<sup>7</sup> that were many orders of magnitude greater than the LOC<sup>8</sup> EPA uses to evaluate exposures, NMFS concludes that:*

- *Pesticide discharges under the four use patterns eligible for coverage under the PGP will result in exposures to toxicants that will affect the survival and fitness of individuals through:*
  - *direct mortality*
  - *reduced growth*
  - *altered behavior*
  - *reduced fecundity (i.e., reduced reproductive output or offspring survival)*

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<sup>7</sup> RQ = Risk Quotient: The estimated pesticide exposure divided by the LC50 selected as the assessment threshold for that pesticide. An RQ is a useful screening reference to draw attention to conditions that suggest adverse effects would occur. Note that RQs do not capture the variation around LC50 estimates or the depth and quality of the data available for an assessment.

<sup>8</sup> LOC = Level of Concern: For nontarget aquatic animals, a risk quotient greater than 0.5 warrants concern. For threatened and endangered animals, a risk quotient of greater than 0.05 is of concern.

- *Pesticide discharges under the four use patterns eligible for coverage under the PGP will result in exposures to toxicants that will affect the survival and fitness of individuals through:*
  - *reduction in extent of inhabitable area/avoidance*
  - *reduction in prey species*
- *Pesticide discharges under the four use patterns eligible for coverage under the PGP will result in adverse effects to designated critical habitat features that are essential to the conservation of the species.*

## **8 CUMULATIVE EFFECTS**

“Cumulative effects” are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR §402.02). Future Federal actions that are unrelated to the proposed action are not considered cumulative effects because they require separate consultation pursuant to section 7 of the ESA if they may affect listed species or critical habitat.

The future intensity of specific non-Federal activities in the action area is molded by difficult-to-predict future economy, funding levels for restoration activities, and individual investment decisions. In addition, the need for communities to adapt to climate change and recover from severe climatic events will influence how wetlands, inland surface waters, and coastal areas are managed. Due to their additive and long-lasting nature, the adverse effects of non-Federal activities that are stimulated by general resource demands, and driven by changes in human population density and standards of living, are likely to compound in the future. Specific human activities that may contribute to declines in the abundance, range, and habitats of ESA-listed species in the action area include the following: urban and suburban development; shipping; infrastructure development; water withdrawals and diversion; recreation, including off-road vehicles and boating; expansion of agricultural and grazing activities, including alteration or clearing of native habitats for domestic animals or crops; and introduction of non-native species which can alter native habitats, out-compete or prey upon native species.

Activities that degrade water quality will continue into the future. These include conversion of natural lands, land use changes from low impact to high impact activities, water withdrawals, effluent discharges, the progression of climate change, the introduction of nonnative invasive species, and the introduction of contaminants, including pesticides. While some of the stressors associated with non-federal activities that degrade water quality will be directly accounted for in section 7 consultations between NMFS and EPA, some may be accounted for only indirectly, while others may not be accounted for at all. In particular, many non-point sources of pollution, which are not subject to Clean Water Act NPDES permit and regulatory requirements, have proven difficult for states to monitor and regulate. Non-point source pollution has been linked to loss of aquatic species’ diversity and abundance, fish kills, seagrass bed declines, and toxic algal



blooms (Gittings 2013). Non-point sources of pollution are expected to increase as the human population continues to grow.

### **8.1 United States Population Growth**

The United States population is growing at a net rate of one person every 14 seconds. Population growth within communities in areas where salmon occur will place pressures on water availability, which affects hydrological conditions and water quality, which includes increases in water temperatures associated with a “built environment.” As of 2017, California has grown at an estimated annual rate of 333,000 per year since 2010. Growth is strongest in the more densely populated counties in the San Francisco Bay Area, the Central Valley, and Southern California: specifically Merced, Placer, and San Joaquin counties (California Department of Finance 2018). Oregon’s estimated population reached 4.14 million on July 1, 2017. This is an increase of 310,026 persons or 8.1 percent since the 2010 Census count. While growth slowed during the 2008 recession, Oregon’s growth rate now ranks in the top 10 in the nation (Vaidya 2017). Between 2017 and 2018, Oregon’s population grew by an additional 54,000 people; the largest gains are in metropolitan areas, with Oregon’s three most populous counties in the Portland metropolitan area. Multnomah and Washington counties each added more than 10,000 residents, and Clackamas County added over 6,000. The largest percentage growth occurred in Deschutes and Crook Counties in Central Oregon (PSU Population Research Center 2018). According to Washington’s 2018 Population Trends report, the state grew by 117,300 persons, or 1.6 percent. Growth was concentrated in the five largest metropolitan counties: King, Pierce, Snohomish, Spokane and Clark. Eastern Washington grew by 1.4 percent and Western Washington by 1.7 percent. Counties along the Interstate 5 corridor grew by 1.7 percent versus 1.4 percent for rest of the state. Metropolitan counties grew 1.6 percent compared to nonmetropolitan counties, which grew 1.3 percent. Counties that border, or are within, Puget Sound grew by 1.7 percent versus non-Puget Sound counties, which grew by 1.5 percent. Rural counties grew by 1.3 percent versus 1.7 percent for non-rural counties (Washington Office of Financial Management 2018).

Population growth will require greater and greater demand on resources, greater demand for food and water, and greater demand for energy. The increase in demand for these essential items is likely to extend pressures on many threatened and endangered species populations and their designated critical habitats. As many cities border coastal or riverine systems, diffuse and extensive growth will increase overall volume of contaminant loading from wastewater treatment plants and runoff from expanding urban and suburban development into riverine, estuarine, and marine habitats. Urban runoff from expanding impervious surfaces and existing and additional roadways is typically warmer than natural surface waters and may also contain oil, heavy metals, polycyclic aromatic hydrocarbons, and other chemical pollutants. Inputs of these point and non-point pollution sources into numerous rivers and their tributaries will affect water quality in available spawning and rearing habitat for salmon. Based on the increase in human population growth, we expect an associated increase in the number of NPDES permits issued and the potential listing of more 303(d) waters with impaired thermal, dissolved oxygen, and nutrient

regimes and impairments by high pollutant concentrations. Continued growth into forested and other natural areas alter landscapes to the detriment of species habitat. Altered landscapes, such as the loss of riparian vegetation along rivers and increases in impervious surfaces, adversely affect the delivery of sediment and gravel and significantly alter stream hydrology and water quality.

A nationwide rise in the population necessitates a rise in agricultural output, and the potential conversion of forested and other natural lands to agriculture. As most of the coastal states have large tracts of irrigated agriculture, this rise in agricultural output is anticipated to affect coastal areas and aquatic species. Impacts from heightened agricultural production will likely result in two negative impacts on listed species. The first impact may come from a needed reliance and greater use and application of pesticide, fertilizers, and herbicides and their increased concentrations and entry into freshwater systems. Toxics and other pollutants from agricultural runoff may further degrade habitats supporting listed species. Second, increased output and water diversions for agriculture may also place greater demands upon limited water resources. Water diversions will reduce flow rates and alter habitat throughout freshwater systems. Reductions in flows could mean higher water temperatures, and as water is drawn off, contaminants will become more concentrated in these systems, exacerbating toxicity.

A rise in population will also require pesticide use to protect public health from disease vectors, control invasive species, and maintain public areas such as recreational waters. This can require the application of pesticides at, near, or over waters where the ESA-listed species occur. The residue left by non-agricultural pesticide applications affecting Waters of the United States that are not within EPA's permitting jurisdiction are regulated under state-issued NPDES permits. Discharges of pesticides are also expected to occur in waters not designated as Waters of the United States such that ESA-listed species will be exposed to pesticide residues from unregulated discharges.

The above issues are likely to pose continuous unquantifiable negative effects on listed species addressed in this opinion, particularly freshwater and anadromous species, and those species adapted to and requiring nearshore and estuarine habitats. Urbanization increases sedimentation, increased point and non-point pollution discharges, and decreased infiltration of rainwater resulting in increased runoff into surface waters. Decreased rainwater infiltration leads to decreases in shallow groundwater recharge, decreases in hyporrheic flow (e.g., water that spreads laterally beneath river gravels outside the channel where surface flows occur), and decreases in summer base flows. For example, the EPA released National Rivers and Streams Assessment 2013-2014 – Collaborative Survey (EPA 2020) that reported only 51 percent of the 186,538 miles of western rivers and streams represented in the survey were in good biological condition based on macroinvertebrate data. These observations did not differ significantly from the 2008-2009 survey. The biological condition of fish communities was significantly lower in the 2013-2014 survey relative to the 2008-2009 survey: Only 38 percent of fish communities assessed in 126,846 miles of western rivers and streams were found to be in good biological condition.

Biological condition is the most comprehensive indicator of water body health. When the biology of a stream is healthy, the chemical and physical components of the stream are also typically in good condition. Nationally, the amount of stream length in good quality for fish condition dropped from 34.8 percent in 2009 to 26.4 percent in 2014. Stream lengths in good condition for macroinvertebrate communities was essentially unchanged: with the proportion of assessed river and stream lengths in good condition at 29.6 percent in 2009 and 30.2 percent in 2014.

## **8.2 Climate Change**

Climate change is discussed in both the environmental baseline section of this opinion and in the cumulative effects section because it is a current and ongoing circumstance that, for the most part, is not subject to consultation, yet influences environmental quality and the effects of the action, currently and in the future. Adaptation projects and new technologies are subject to consultation if they are federally constructed, permitted, or funded. NMFS' policy with respect to climate change when evaluating an agency's action is to project climate effects over the timeframe of the action's consequences, when appropriate. It will usually be the case that consideration is not limited to only the duration of the specified activity, but also to its continuing effects for the foreseeable future. For example, where a construction activity is the subject of consultation, we must consider not only the effects caused from the construction itself, but also the effects of the resulting structure once completed. Similarly, in the case of consultations on permits or other authorizations that are likely to be renewed, it can be appropriate to analyze the project over some period of time beyond the initial authorization period to the fullest extent possible (based on the information available and the ability to predict impacts with an acceptable degree of accuracy).

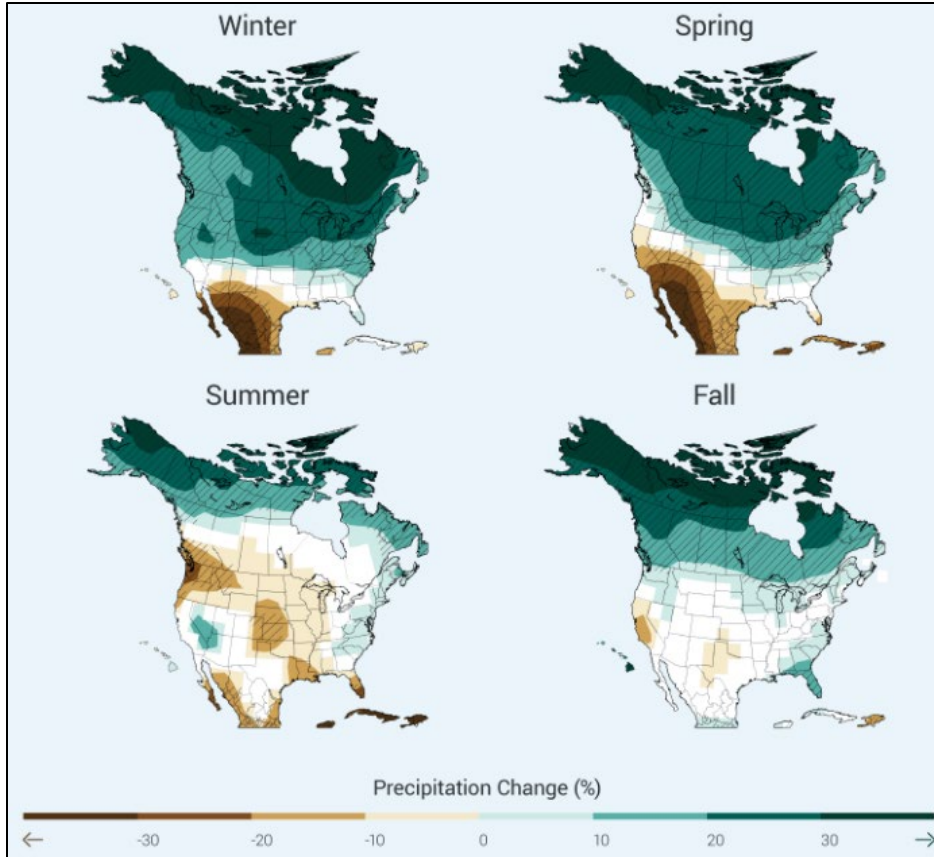
Climate change has the potential to impact species abundance, geographic distribution, migration patterns, and susceptibility to disease and contaminants, as well as the timing of seasonal activities and community composition and structure (Macleod et al. 2005, Robinson and Gore 2005, Kintisch 2006, Learmonth et al. 2006, McMahan and Hays 2006, Evans and Bjørge 2013, IPCC 2014). Though predicting the precise consequences of climate change on highly mobile marine species is difficult (Simmonds and Isaac 2007), recent research has indicated a range of consequences is already occurring. These impacts will be exacerbated by sea level rise. The loss of habitat because of climate change could be accelerated due to a combination of other environmental and oceanographic changes such as an increase in the frequency of storms and/or changes in prevailing currents, both of which could lead to increased beach loss via erosion (Antonelis et al. 2006) (Baker et al. 2006).

Altered ocean conditions projected with climate change include ocean acidification (IPCC 2013). The oceans have absorbed much of the carbon dioxide (CO<sub>2</sub>) released from the burning of fossil fuels, and other land-use emissions, resulting in chemical reactions that lower pH (Tans, 2009). This has caused an increase in hydrogen ion (acidity) of about 30% since the start of the industrial age. A growing number of studies have demonstrated adverse impacts on marine

organisms, including: 1) the rate at which reef-building corals produce their skeletons decreases, 2) the ability of marine algae and free-swimming zooplankton to maintain protective shells is reduced, and 3) the survival of larval marine species including commercial fish and shellfish is reduced (Cohen and Holcomb 2009, Cooley et al. 2009, Feely et al. 2009, Kleypas 2009).

Changes in the marine ecosystem caused by global climate change (e.g., ocean acidification, salinity, oceanic currents, dissolved oxygen levels, nutrient distribution) could influence the distribution and abundance of lower trophic levels (e.g., phytoplankton, zooplankton, submerged aquatic vegetation, crustaceans, mollusks, forage fish), ultimately affecting primary foraging areas of ESA-listed species. Marine species ranges are expected to shift as they align their distributions to match their physiological tolerances under changing environmental conditions (Doney et al. 2012). Hazen et al. (2012) examined top predator distribution and diversity in the Pacific Ocean in light of rising sea surface temperatures using a database of electronic tags and output from a global climate model. They predicted up to a 35 percent change in core habitat area for some key marine predators in the Pacific Ocean, with some species predicted to experience gains in available core habitat and some predicted to experience losses.

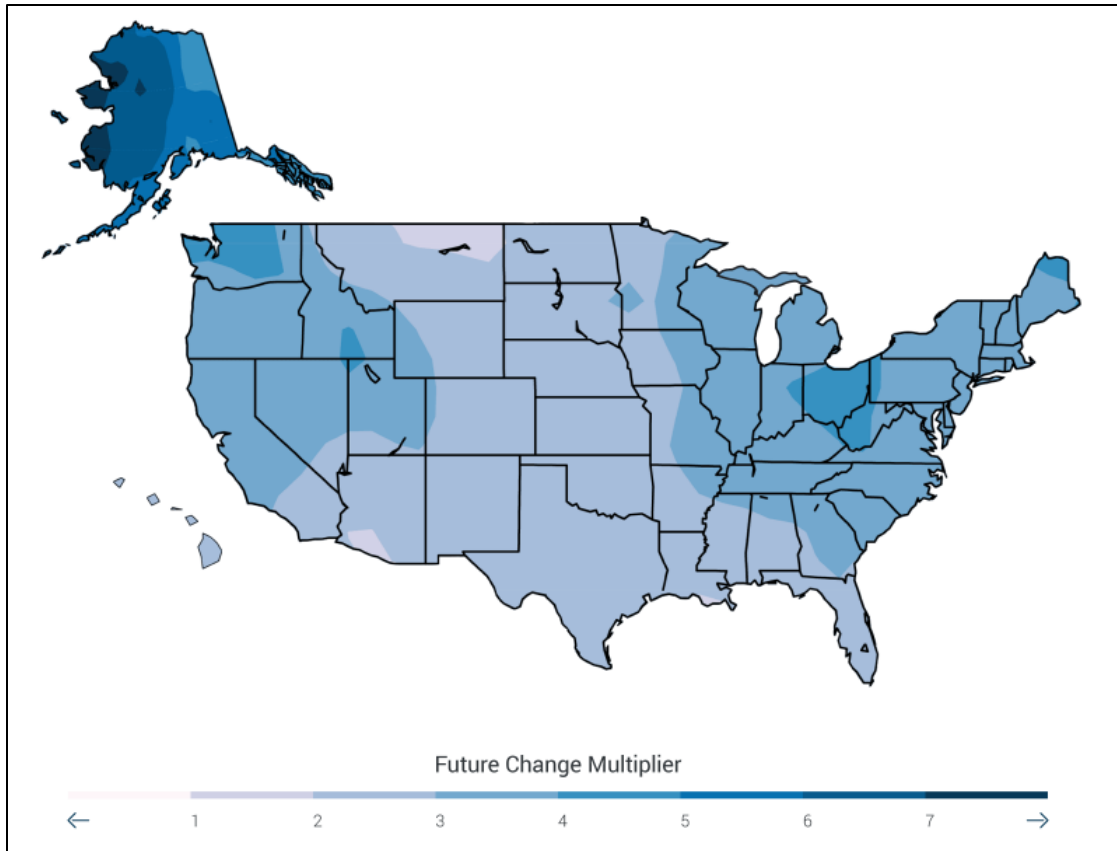
Given the challenges of monitoring and controlling non-point source pollution and accounting for all the potential stressors and effects on ESA-listed species, discharges from all sources will continue to result in aggregate impacts. As climate change proceeds, precipitation rates will change (Figure 8), and the frequency of heavy rainfall events, where erosion of contaminated soil and stormwater control upsets are more likely, is expected to increase nationwide (Figure 9). Interaction of climate change effects on precipitation with the aggregate of the built environment resulting from construction activities will require NMFS to apply sustained attention to aggregate effects.



**Figure 8. Seasonal precipitation change for 2071-2099 (compared to 1970-1999).<sup>9</sup>**

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<sup>9</sup> Assumes existing emissions rate increases. Hatched areas are projected changes that are significant and consistent among models, unhatched areas indicate projected changes do not differ from natural variability. (Figure source: NOAA NCDC / CICS-NC). <http://nca2014.globalchange.gov/report/our-changing-climate/precipitation-change>



**Figure 9. Increase in frequency of extreme daily precipitation events for 2081-2100 (compared to 1981-2000).<sup>10</sup>**

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<sup>10</sup> <http://nca2014.globalchange.gov/report/our-changing-climate/precipitation-change>

## 9 INTEGRATION AND SYNTHESIS OF EFFECTS

The *Integration and Synthesis* section is the final step in our assessment of the risk posed to species and critical habitat because of implementing the action. In this section, we consider the prior analyses and baseline conditions in NMFS' opinion on the 2016 PGP with the *Effects of the Action* (Section 7) analysis in this opinion evaluating changes made for the 2021-2026 PGP permit term, updates to the environmental baseline (Section 6 of this opinion), and anticipated cumulative effects (Section 8 of this opinion) to formulate the agency's biological opinion as to whether the proposed action is likely to: (1) reduce appreciably the likelihood of both the survival and recovery of a ESA-listed species in the wild by reducing its numbers, reproduction, or distribution; or (2) reduce the value of designated or proposed critical habitat for the conservation of the species. These assessments are made in full consideration of the *Status of the Species and Critical Habitat* (Section 6.2 of NMFS' opinion on the 2016 PGP updated in Section 5 of this opinion).

Recent status reviews indicate that the Southern resident killer whale, the Gulf of Maine DPS of Atlantic sturgeon, and the North Pacific DPS of Loggerhead turtle are declining or not improving. While status reviews for ESA-listed Caribbean corals or coho salmon have not been completed since the 2016 PGP consultation, it is reasonable to expect that these species are doing poorly as a consequence of recent disease and extreme storm events in the Caribbean and, for Coho, pre-spawn mortality as fish migrate through urban streams. NMFS relies on the status reviews for the most recent information on changes in population trajectories and novel stressors, such as pre-spawn mortality, that were not identified at the time of listing.

Through the PGP, EPA will authorize discharges of pesticide pollutants on, over, or near Waters of the United States during the permit period from 2021 to 2026. The EPA estimates the total number of pesticide Decision-makers and Applicators authorized under the 2021 PGP to be about 14,300 and reported that about 350 Operators submitted a NOI from 2016-2021. A subset of Operators filing NOI are required to submit annual reports identifying the actual pesticides used and waters exposed to pesticide applications. The NOI only identifies the general area and types of activities (e.g., flying pest control, canopy pest control, etc.) that may occur over the permit term. While EPA can interpret the NOI and annual reports to get a general sense of the discharges that are occurring, 97 percent of the pesticide Decision-makers and Applicators covered by the PGP are not required to file an NOI. Thus, there is considerable uncertainty regarding the actual number, location, timing, and composition of discharges to Waters of the United States authorized that occurred under the 2016 PGP and will occur under the 2021 PGP. Considerable uncertainty remains in this consultation regarding subsequent exposures and responses under the proposed 2021 PGP.

The EPA's BE on the PGP and NMFS' opinions on the re-registration of several pesticides establish that pesticides applied according to FIFRA labeling adversely affect ESA-listed species. In many cases, NMFS' opinions conclude that application under FIFRA labeling jeopardizes the continued existence of such species and results in adverse modification of their

designated critical habitat (NMFS 2008a, 2009, 2010, 2011, 2017)). It is EPA's intention to mitigate this risk for the four use patterns covered by the PGP through its implementation of the PGP.

The risk analysis of the 2016 consultation concluded that, given the uncertainty in actual discharges to be authorized, population level effects will occur on ESA-listed species under NMFS' jurisdiction in the absence of effective implementation of the protective measures under the PGP. This is particularly a concern because consultations on FIFRA labelling have identified discharges that result in population-level risks to ESA-listed species and designated critical habitat under NMFS' jurisdiction. Because the action has not changed from the 2016 PGP, this risk analysis is still valid.

The analysis for the 2016 PGP concluded that, as written, EPA will not be able to reliably estimate the probable number, location, and timing of the discharges that would be authorized by the program to waters where ESA-listed species and designated critical habitat under NMFS' jurisdiction occur. For the 2021 PGP, this risk analysis conclusion is still valid because:

1. EPA's definition of NMFS' Listed Resources of Concern for the 2021 PGP does not include critical habitat designated for Atlantic sturgeon or proposed critical habitat for coral species. This definition is used to identify discharges that require that an NOI be submitted and include information on anticipated discharges based on expected pests and pest control needs. This incomplete definition prevents EPA from being able to estimate whether or to what degree specific endangered or threatened species or designated critical habitat are likely to be exposed to stressors resulting from PGP-authorized discharges.
2. EPA will not be able to reliably estimate the stressors that are likely to be produced as a direct or indirect result of all PGP-authorized discharges because only those NOI identifying discharges to waters where EPA defined NMFS' Listed Resources of Concern occur will include information on the planned discharges (i.e., not include designated critical habitat for the Atlantic sturgeon or for critical habitat for proposed coral species).
3. EPA is not likely to know or be able to determine whether or to what degree Decision-makers comply with the conditions, restrictions, or mitigation measures required under the 2021 PGP. EPA will not be able to identify and inspect a representative number of dischargers to determine compliance because most PGP-authorized dischargers are automatically covered under the PGP and have no reporting requirement.
4. The self-monitoring and self-reporting conditions of the PGP do not enable EPA to continually identify, collect, and analyze information about authorized actions that may have exposed ESA-listed species or designated critical habitat to stressors at concentrations, intensities, durations, or frequencies that are known or suspected to produce physical, physiological, behavioral, or ecological responses that have potential individual or cumulative adverse consequences for individual organisms or essential elements of designated critical habitat.



5. Dischargers will not always be able to observe adverse responses resulting from their pesticide applications and not all dischargers will provide annual reports identifying their discharges. Thus, EPA will not know if exposures are occurring at concentrations, durations, or frequencies that are known, or suspected to, produce adverse effects to ESA-listed species or essential elements of designated critical habitat.

The PGP requirement that all Decision-makers making discharges to waters where NMFS' Listed Resources of Concern submit an NOI incorporates NMFS expertise either directly or indirectly to assist EPA in identifying discharges that may result in adverse effects and ensures its authorizations prevent or minimize exposures to avoid adverse effects. The success of this approach requires that:

1. every discharge authorized under the PGP has a Decision-maker;
2. the Decision-maker is able and willing to determine whether NMFS' Listed Resources of Concern are present in any of their pesticide management areas;
3. the Decision-maker files an NOI when required to do so due to ESA concerns;
4. NMFS reviews the NOI to determine whether the eligibility criterion has been met, could be met with additional conditions, or whether the eligibility criterion is not met;
5. EPA relies on NMFS' determination in identifying eligibility for authorization, making any additional condition a requirement for coverage or requiring an individual permit if NMFS determined that eligibility criteria cannot be met; and
6. if found eligible for coverage under the PGP, that the Decision-maker proceeds with the discharges identified in the NOI and reviewed by NMFS, implementing any additional controls required for coverage.

As with the 2016 PGP, these conditions are not necessarily met under the 2021 PGP. Discharges are not covered under the PGP if a Decision-maker fails to file an NOI when required to do so. In such cases, the Decision-maker violates the Clean Water Act upon discharge. Furthermore, because not all discharges are required to file an NOI under the PGP, the availability of the PGP may result in inadvertent violations of the Clean Water Act by Decision-makers who fail to self-identify as needing to file an NOI. This may occur when Decision-makers incorrectly conclude that NMFS' Listed Resources of Concern are absent from their pest management area.

Discharges made under these circumstances are not covered by the PGP, but the consequences of such discharges are effects of EPA's issuance of the PGP.

Cases where discharges in violation of the Clean Water Act were made as a result of failure to file an NOI under the 2011 or 2016 PGP when an NOI was required were not identified by EPA. There is no evidence whether EPA actively tried to identify unintentional violators and bring them into compliance with the Clean Water Act through the PGP. Furthermore, there is no mechanism under the PGP to track dischargers expecting coverage, but not required to file an NOI.

Based on our evaluation of PGP implementation in the different areas where EPA has permitting authority, species vulnerable to the effects of EPA's issuance of the PGP are those that occur in Massachusetts, Washington, Puerto Rico, and migrate to Idaho. The timing, intensity, frequency, and duration of these exposures cannot be known on the following species and designated and proposed critical habitat:

- Idaho
  - salmon, Chinook (Snake River fall-run ESU)
  - salmon, Chinook (Snake River spring/summer-run ESU)
  - salmon, sockeye (Snake River ESU)
  - steelhead (Snake River Basin DPS)
- Washington
  - Designated Critical Habitat (Chinook Salmon) for Southern resident killer whale
- Massachusetts
  - Atlantic sturgeon (Gulf of Maine DPS, New York Bight DPS, Chesapeake DPS)
  - shortnose sturgeon
  - green turtle
  - hawksbill turtle
  - Kemp's ridley turtle
  - leatherback turtle
  - loggerhead turtle (Northwest Atlantic DPS)
- Puerto Rico
  - Nassau Grouper
  - elkhorn coral
  - staghorn coral
  - lobed star coral
  - boulder star coral
  - mountainous star coral
  - pillar coral
  - rough cactus coral

## 10 CONCLUSION

Because the action includes discharges from an unknown number and location of discharges, the determinations made in this opinion apply over the entire action area of EPA's permitting authority and thus apply to newly designated critical habitats for Atlantic sturgeon, and critical habitat proposed for the Southern resident killer whale, ESA-listed Caribbean corals and ESA-listed Indo-Pacific corals, as well as the species and designated critical habitats evaluated for adverse effects in the 2016 PGP opinion, as updated in Section 5.2 of this opinion.

After considering the current status of ESA-listed species, the environmental baseline, the potential effects of the action, and the cumulative effects of concurrent and future nonfederal actions in context of the controls, monitoring, and feedback loops, and integration of NMFS expertise through the ESA Eligibility Criteria, it is NMFS' opinion that EPA's reissuance of the PGP will likely jeopardize the continued existence of Southern Resident Killer Whale, Atlantic sturgeon (Gulf of Maine and New York Bight DPSs), shortnose sturgeon, green turtle (North Atlantic DPS), hawksbill turtle, Kemp's ridley turtle, leatherback turtle, loggerhead turtle (Northwest Atlantic DPS), Nassau grouper, the Caribbean coral species: elkhorn coral, staghorn coral, lobed star coral, boulder star coral, mountainous star coral, pillar coral, and rough cactus coral, and the Pacific coral species: *Acropora globiceps*, *Acropora jacquelineae*, *Acropora retusa*, *Acropora speciosa*, *Euphyllia paradivisa*, *Isopora crateriformis*, *Orbicella annularis*, and *Seriatopora aculeata*.

After placing the current status of the designated critical habitat, critical habitat proposed for designation under the ESA, the environmental baseline, the potential effects of the action, and the cumulative effects of concurrent and future nonfederal actions in context of the controls monitoring and feedback loops, and integration of NMFS expertise through the ESA Eligibility Criteria, it is NMFS' opinion that EPA's reissuance of the PGP is likely to destroy or adversely modify designated critical habitat for Atlantic sturgeon (Gulf of Maine and New York Bight DPSs), and critical habitat proposed for the Caribbean coral species: elkhorn coral, staghorn coral, lobed star coral, boulder star coral, mountainous star coral, pillar coral, and rough cactus coral, and the Pacific coral species: *Acropora globiceps*, *Acropora jacquelineae*, *Acropora retusa*, *Acropora speciosa*, *Euphyllia paradivisa*, *Isopora crateriformis*, *Orbicella annularis*, and *Seriatopora aculeata*.

## 11 REASONABLE AND PRUDENT ALTERNATIVE

Because we have concluded that the proposed general permit continues to fail to comply with the requirements of section 7(a)(2) of the ESA, resulting in jeopardy and damage or adverse modification, we have provided an RPA that would allow EPA to comply with those requirements. Regulations implementing section 7 (50 CFR 402.02) define RPAs as alternative actions, identified during formal consultation, that: (1) Can be implemented in a manner consistent with the intended purpose of the action; (2) Can be implemented consistent with the scope of the action agency's legal authority and jurisdiction; (3) Are economically and technologically feasible for the action agency to implement; and (4) Would, in NMFS' opinion, avoid the likelihood of jeopardizing the continued existence of endangered or threatened species or resulting in the destruction or adverse modification of critical habitat. This RPA applies only in those locations where the general permit authorizes discharges overlapping with the ranges of endangered and threatened species under NMFS' jurisdiction: the District of Columbia, Massachusetts and New Hampshire; all Indian lands in Virginia; all territories except for Virgin Islands; and federal facilities in Delaware and Washington,. In addition, this RPA is not applicable to discharges to Waters of the United States on Federal lands for which an existing consultation addresses those activities.

The 2021 PGP RPA consists of four elements that EPA must implement in their entirety to ensure that PGP-authorized actions are not likely to jeopardize the continued existence of endangered or threatened species under the jurisdiction of NMFS or destroy or adversely modify critical habitat that has been designated for any of these species.

The RPA will allow EPA to demonstrate that it is able to satisfy the requirements of section 7(a)(2) of the ESA by reliably:

- Estimating the probable number, location and timing of the discharges that would be authorized by the permit when NMFS' Listed Resources of Concern may be exposed;
- Estimating whether or to what degree specific endangered or threatened species or designated critical habitat are likely to be exposed to authorized discharges and
- Determining whether or to what degree operators have complied with the conditions of the permit.

### 11.1 RPA Element One

**Rationale:** While the PGP provides an additional layer of protection over restrictions provided by the FIFRA registrations, the analysis in the biological opinion for the 2016 PGP concluded that EPA's issuance of the PGP was likely to jeopardize the continued existence of 33 endangered or threatened species under NMFS' jurisdiction and result in the destruction or adverse modification of critical habitat designated for 29 of those species. While the PGP action area has changed, the 2021 PGP is not substantively different from the 2016 PGP. Since issuance

of the 2016 PGP, NMFS has finalized designated critical habitat for Atlantic sturgeon and proposed critical habitat for ESA-listed corals in the Pacific and Caribbean.

The 2021 PGP applies protective measures throughout the permit for discharges that may expose NMFS' Listed Resources of Concern as defined in Appendix A of the permit. Appendix A of the draft 2021 PGP identifies NMFS Listed Resources of Concern as:

*“NMFS Listed Resources of Concern – federally-listed endangered and threatened species and federally-listed critical habitat for which NMFS, in its Biological Opinion entitled, ‘2016 Endangered Species Act Section 7 Consultation Biological Opinion on the United States Environmental Protection Agency’s Proposed Pesticides General Permit,’ concluded the draft 2016 PGP, absent any additional mitigating measures, would either jeopardize the continued existence of such species or destroy or adversely modify such critical habitat. The Biological opinion included a Reasonable and Prudent Alternative, implemented through this permit, to avoid likely jeopardy to listed species or adverse modification of critical habitat. Additional information, including maps noting where these resources overlap with PGP areas of coverage is available at <https://www.epa.gov/npdes/pesticide-permitting-ESA-procedures>.”*

**RPA:** In order for the 2021 PGP to provide protection of critical habitat recently designated by NMFS, the definition of NMFS Listed Resources of Concern must be corrected to read:

*“NMFS Listed Resources of Concern – federally-listed endangered and threatened species and federally-designated or proposed critical habitat for which NMFS, in its Biological opinion entitled, ‘2021 Endangered Species Act Section 7 Consultation Biological opinion on the United States Environmental Protection Agency’s Proposed Pesticides General Permit,’ concluded the draft 2021 PGP, absent any additional mitigating measures, would either likely jeopardize the continued existence of such species or destroy or adversely modify such critical habitat. The Biological opinion included a Reasonable and Prudent Alternative, implemented through this permit, to avoid likely jeopardy to listed species or adverse modification of critical habitat. Additional information, including maps noting where these resources overlap with PGP areas of coverage is available at <https://www.epa.gov/npdes/pesticide-permitting-ESA-procedures>.”*

## 11.2 RPA Element Two

**Rationale:** EPA must correct the NOI consistency review process. In particular, EPA needs to clarify in the form for an NOI the type of information needed for self-certification that the discharge will not result in any short or long term adverse effects to NMFS' Listed Resources of Concern and ensure NMFS receives the correct information to be able to review the NOI.

**RPA:** The 2021 PGP needs include clear instructions in the NeT NOI application the type of information needed for self-certification to ensure NMFS receives the correct information to

review the NOI. The 2021 PGP and NeT NOI application will include the following instructions and clarifications in the ESA procedures for applicants:

- The NeT process for the PGP will adopt, to the extent practicable, the smartform strategy used by the Multisector General Permit to guide the applicant toward an accurate certification.
- The NeT instructions will include a link to the Pesticide Permitting-ESA Procedures page ([https://www.epa.gov/npdes/pesticide-permitting-ESA-procedures](https://www.epa.gov/npdes/pesticide-permitting-esa-procedures), ESA web page).
- EPA will report the number of visits to the Pesticide Permitting-ESA Procedures page with the annual report analyses provided to NMFS
- The ESA certification definition in the permit, the ESA Procedures web page, and NeT instructions will include the following changes:
  - A statement reminding applicants section 9 of the Endangered Species Act prohibits take (e.g., harm or harassment) of ESA-listed species.
  - Criterion A: For those applicants certifying that ESA-protected species do not occur in the action area, Criterion A will state, with emphasis, that:
 

Decision-makers are required to demonstrate that their action area does not overlap with areas where NMFS-listed species occur by attaching an aerial image of the pest management area(s) using the maps and resources at [https://www.epa.gov/npdes/pesticide-permitting-ESA-procedures](https://www.epa.gov/npdes/pesticide-permitting-esa-procedures).
  - Criterion B: For those pesticide applications that have previously undergone section 7 consultation, an emphasized statement that:
 

Decision-makers are required to provide the pertinent tracking numbers or identifiers associated with the consultation (e.g., IPaC number, ECO number), identify the USFWS and NMFS field office/regional office(s) providing the consultation, any copies of supporting correspondence with USFWS and/or NMFS, as appropriate, and the date the consultation was completed.
  - Criterion C, For those holding a section 10 permit will state, with emphasis, that:
 

Decision-makers are required to provide the pertinent tracking numbers or identifiers associated with the section 10 permit, the date the section 10 permit was granted, whether the permit was granted by the USFWS and/or NMFS, and the field office/regional office(s) granting the permit.
  - Criterion D. Pesticide application activities in response to a Declared Pest Emergency Situation will state, with emphasis, that:
 

Decision-makers are required to provide information on anticipated applications and provide a rationale as to why any short or long term

adverse effects are not expected or why the pest emergency poses a greater threat to the ESA-listed species than the pesticide application.

- Criterion E. This criterion will state, with emphasis, that:

Decision-makers are required to attach the written supporting correspondence from NMFS. Eligibility under this criterion is contingent upon the Decision-maker following any measures described in correspondence from NMFS designed to avoid or eliminate the likelihood of any short or long term adverse effects.

- Criterion F. Decision-maker demonstrates pesticide application activities are not likely to result in any short or long term adverse effects to NMFS' Listed Resources of Concern or that the pest poses a greater threat to the NMFS' Listed Resources of Concern than does the discharge of the pesticide will state, with emphasis, that:

Decision-makers must provide complete and accurate information and provide EPA with their documentation demonstrating the basis for their finding.

### 11.3 RPA Element Three

**Rationale:** This element will ensure that the discharge of residues from the application of piscicides or those pesticides that a previous NMFS' biological opinion has determined the labeled use is likely to jeopardize the continued existence of ESA-listed species and/or result in the destruction or adverse modification of designated critical habitat are identified to the Decision-maker so they may proactively seek technical assistance from NMFS prior to discharging to areas where NMFS Listed Resources of Concern occur. This will better enable NMFS to ensure that specific applications of these high risk pesticides do not cause any short or long term adverse effects to ESA-listed species and designated critical habitat under NMFS' jurisdiction.

**RPA:** The 2021 PGP NOI in NeT and EPA's Pesticide Permitting-ESA Procedures webpage will instruct applicants to seek technical support from an ESA section 7 biologist from the regional NMFS office or from the Office of Protected Resources in Silver Spring, Maryland if applicants will potentially discharge residues from the application of piscicides or those pesticides that a NMFS' biological opinion has determined the labeled use would jeopardize the continued existence of ESA-listed species and/or adversely modify designated critical habitat.

- The NeT NOI will include the following alert for discharges made to waters where NMFS' Listed Resources of Concern occur:

*If your Pest Management Area overlaps with waters where NMFS' Listed Resources of Concern occur and you expect to discharge residues from the application of piscicides or those pesticides that a NMFS' biological opinion has determined the labeled use would jeopardize the continued existence of ESA-listed species and/or adversely modify designated critical habitat, it is in your best*

*interest to contact your regional NMFS office or the Office of Protected Resources in Silver Spring, Maryland and request “technical assistance on potential pesticide applications from an ESA section 7 biologist.” As of July 2021, these pesticides include:*

2,4-D  
 Carbaryl  
 Chlorothalonil  
 Chlorpyrifos  
 Diazinon  
 Diuron  
 Malathion  
 Naled  
 Oryzalin  
 Pendimethalin

*Check the Pesticide Permitting-ESA Procedures webpage [<https://www.epa.gov/npdes/pesticide-permitting-esa-procedures>] for the most up to date list of pesticides that a NMFS' biological opinion has determined the labeled use would jeopardize the continued existence of ESA-listed species and/or adversely modify designated critical habitat.*

- EPA will include links to the following webpages for contact information on the Pesticide Permitting-ESA Procedures webpage:
  - Contact NMFS on the West Coast: <https://www.fisheries.noaa.gov/west-coast/consultations/esa-section-7-consultations-west-coast>
  - Contact NMFS in the Pacific Islands: <https://www.fisheries.noaa.gov/pacific-islands/endangered-species-conservation/esa-consultations-pacific-islands>
  - Contact NMFS for the East Coast and Puerto Rico: <https://www.fisheries.noaa.gov/contact/office-protected-resources>
- EPA will include the following statement, and pesticide list on the Pesticide Permitting-ESA Procedures webpage upon issuing the PGP.

*If your Pest Management Area overlaps with waters where NMFS' Listed Resources of Concern occur and you expect to discharge residues from the application of pesticides or those pesticides that a NMFS' biological opinion has determined the labeled use would jeopardize the continued existence of ESA-listed species and/or adversely modify designated critical habitat, it is in your best interest to contact your regional NMFS office or the Office of Protected Resources in Silver Spring, Maryland (contacts below) and request “technical assistance on potential pesticide applications from an ESA section 7 biologist.” As of July 2021, these pesticides include:*

2,4-D



Carbaryl  
 Chlorothalonil  
 Chlorpyrifos  
 Diazinon  
 Diuron  
 Malathion  
 Naled  
 Oryzalin  
 Pendimethalin

*This list will be updated over the 2021-2026 PGP permit term.*

- EPA will update, as appropriate, the list of pesticides that a NMFS' biological opinion has determined that the labeled use would jeopardize the continued existence of ESA-listed species and/or adversely modify designated critical habitat on the Pesticide Permitting-ESA Procedures page over the 2021-2026 PGP permit term.

#### **11.4 RPA Element Four**

**Rationale:** This element strengthens ESA protections under the PGP by increasing Decision-maker engagement to ensure that those making discharges to waters where NMFS' Listed Resources of Concern occur are fully aware of their need to address effects to ESA species and submit an NOI. RPA Element 4 ensures that NMFS is able to evaluate any potential short or long term adverse effects to ESA-listed species under NMFS' jurisdiction resulting from these discharges. RPA Element 4 will be addressed through two efforts, one to be implemented for the 2021 PGP and one to be developed for implementation over future PGPs.

For the 2021 PGP, EPA will increase Decision-maker engagement in the ESA certification process by, reviewing the ESA procedures webpage, and integrating RPA three into its NeT training effort for the 2021 PGP. For future PGP permits, EPA will initiate the development of an approach that: will seek to understand how many total dischargers are covered by the PGP, increase compliance with permit requirements in areas where NMFS' Listed Resources of Concern occur, and improve data collection.. This will also allow EPA to better assess the aggregate impacts within areas where NMFS' Listed Resources of Concern occur to better meet the programmatic requirement that EPA will be able to *“reliably estimate the probable number, location, and timing of the discharges that would be authorized by the program to waters where ESA-listed species and designated critical habitat under NMFS' jurisdiction occur.”* per NMFS' Programmatic Analysis on the 2016 PGP that was applied to the 2021 PGP.

**RPA:** For implementation over the 2021 Permit Term, EPA will develop and implement training for PGP Decision-makers that, with input from NMFS, will review the ESA procedures webpage and will integrate RPA three into its NeT training effort for the 2021 PGP.

- EPA will send NMFS draft materials for review for the ESA portion of the NeT training by August 31, 2021.

- EPA will finalize the training and conduct at least two training sessions with this material prior to the effective date of the PGP and launching the NeT NOI system by October 31, 2021.

For future permits, EPA will develop a plan to integrate a geospatial mapping tool that Decision-makers will use to delineate their Pest Management Area(s) (i.e., draw or upload a polygon) and determine whether their Pest Management Area(s) overlap with waters where NMFS' Listed Resources of Concern occur.<sup>11</sup> Where such overlap occurs, the tool will then direct Decision-makers to complete an NOI, thereby ensuring that EPA is aware of all the discharges it is authorizing and that ESA concerns are identified and addressed such that EPA can interpret the aggregate effect of its authorizations and thus identify areas where aggregate impacts may become problematic within areas where NMFS' Listed Resources of Concern occur or may spill over into effects in waters where they occur. This will be implemented for subsequent PGP permits, once complete. The specific tasks required are:

- EPA will develop and submit to NMFS for review an initial scoping document within six months of issuing the 2021 PGP. The scoping plan will identify the following:
  - The specific mapping resource selected (e.g., Stormwater Discharge Mapping Tool, PGP NMFS Listed Resources of Concern Interactive Mapping Tool),
  - Data format requirements,
  - Point(s) of contact for the development plan, and
  - A process diagram for how the tool is intended to operate.
- EPA will respond to NMFS' comments on the scoping plan within one month of receipt.
- EPA will develop a draft implementation plan within 12 months of NMFS providing, to EPA, data meeting the data format requirements specified in the scoping document.
- EPA will submit a final plan and implementation schedule to NMFS upon requesting consultation prior to the expiration of the 2021 PGP.

## 12 INCIDENTAL TAKE STATEMENT

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 a special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by regulation to include significant habitat modification or degradation that results in death or injury to ESA-listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (see 50 CFR §222.102).

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<sup>11</sup> This could be accomplished by adapting EPA's existing Stormwater Discharge Mapping tool, but EPA may have has other tools to consider.

Incidental take is defined as take that results from, but is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity (see 50 CFR §402.02). Section 7(b)(4) and 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this incidental take statement.

The take exemption in this ITS applies only if the RPA is implemented.

### **12.1 Amount of Take**

ESA section 7 regulations require NMFS to specify the impact of any incidental take of endangered or threatened species; that is, the amount or extent, of such incidental taking on the species (50 CFR § 402.14 (i)(1)(i)). When, as here, the precise location and number of events resulting in incidental take is unknown, NMFS may identify a surrogate rather than an amount or level of incidental take. A surrogate (e.g., similarly affected species or habitat or ecological conditions) may be used to express the amount or extent of anticipated take provided that the biological opinion or [ITS]: describes the causal link between the surrogate and take of the listed species, explains why it is not practical to express the amount or extent of anticipated take or to monitor take-related impacts in terms of individuals of the listed species, and sets a clear standard for determining when the level of anticipated take has been exceeded. (50 CFR § 402.14(i)(1)(i)).

The action area includes large areas over which EPA has permitting authority and the exact location, composition, time, and frequency of the individual discharges that will be authorized under the RPA for the 2021 PGP are unknown. We are, therefore, not able to quantify how many individuals of each species and life stage exist in affected waters, especially considering that the numbers of individuals vary with the season, environmental conditions, and changes in population size due to recruitment and mortality over the course of a year. In addition, we currently have no means to determine which deaths or injuries in populations across the entire range of the ESA-listed species and designated critical habitat covered in this opinion are due to the discharges under the PGP with the RPA implemented versus other environmental stressors, competition, and predation.

Because we cannot determine the amount of take, NMFS identifies, as a surrogate for the allowable extent of take, the ability of this action to proceed without any adverse incident, defined below, to non-target species, that is attributed to any pesticide discharged in accordance with the general permit in waters where ESA-listed species under NMFS' jurisdiction occur. An adverse incident to fish is considered attributable to a pesticide discharged in accordance with the general permit if that pesticide is known to have been discharged prior to, and near or upstream of the adverse incident and there is evidence that the pesticide caused the adverse incident (e.g. the detection of pesticide, adjuvants, surfactants, or degradates in water samples from the area or in tissue samples of affected fish). An adverse incident means an unusual or unexpected incident that an Operator has observed upon inspection or of which the Operator otherwise become aware, in which:

1. There is evidence that a person or non-target organism has likely been exposed to a pesticide, and
2. The person or non-target organism suffered a toxic or adverse effect.

The phrase toxic or adverse effects includes effects that occur within Waters of the United States on non-target plants, fish or wildlife that are unusual or unexpected (e.g., effects are to organisms not otherwise described on the pesticide product label or otherwise not expected to be present) as a result of exposure to a pesticide and may include:

- Distressed or dead juvenile and small non-target aquatic organisms
- Washed up or floating non-target aquatic organisms
- Non-target aquatic organisms swimming abnormally or erratically
- Non-target aquatic organisms lying lethargically at water surface or in shallow water
- Non-target aquatic organisms that are listless or nonresponsive to disturbance
- Stunting, wilting, or desiccation of non-target submerged or emergent aquatic plants

Other dead or visibly distressed non-target aquatic organisms (amphibians, turtles, invertebrates, etc.)

The phrase, toxic or adverse effects, also includes any adverse effects to humans (e.g., skin rashes) or domesticated animals that occur either from direct contact with or as a secondary effect from a discharge (e.g., sickness from consumption of plants or animals containing pesticides) to Waters of the United States that are temporally and spatially related to exposure to a pesticide (e.g., vomiting, lethargy).

The association of take with adverse pesticide incidents in waters where ESA-listed species and designated and proposed critical habitat occur relates to the expectation that individuals of ESA-listed species would be similarly affected during such adverse incidents and take of the ESA-listed individuals may not be detected due to co-occurring events such as scavenging, decay, or submergence. Further, the occurrence of a single incident would indicate an unknown number of future incidents is reasonably certain to occur. Any incident where non-target organisms appear injured or killed as a result of PGP-authorized discharges to Waters of the United States containing NMFS listed species will be considered an exceedance of take.

The EPA has already integrated the RPAs and RPMs required in the 2011 and 2016 biological opinions in the PGP. Even so, these improvements in the ESA procedures to protect NMFS' Listed Resources of Concern are required to improve the information NMFS receives to advise EPA on its authorization of such discharges with respect to EPA's obligations under the ESA.

The goals of the RPA, and the RPMs below are to ensure that:

- The potential for exposure of ESA-listed species and designated critical habitat (NMFS' Listed Resources of Concern) to PGP-authorized discharges over the 2021-2026 permit term is accurately identified,
- NMFS will continue to receive all NOI and annual reports associated with such discharges, and
- NOI and annual reports will contain the necessary and accurate information to allow NMFS to advise EPA on its authorization of such discharges with respect to EPA's obligations under the ESA.
- EPA will obtain the information it needs to understand the aggregate impacts of its authorized discharges.

## **12.2 Reasonable and Prudent Measures**

To satisfy its obligations pursuant to section 7(a)(2) of the ESA, the EPA must: (1) Monitor the direct, indirect, and cumulative impacts of the activities authorized by the issuance of the general permit; and (2) Evaluate the direct, indirect, or aggregate impacts of the activities authorized by the issuance of the general permit and the consequences of those effects on ESA-listed species under NMFS' jurisdiction. The purpose of the monitoring is to provide data for the EPA to use to identify necessary modifications to the general permit in order to reduce exposures to ESA-listed species under NMFS' jurisdiction. NMFS believes all measures described as part of the proposed action, together with use of the Reasonable and Prudent Measures and Terms and Conditions described below, are necessary and appropriate to minimize the likelihood of incidental take of ESA-listed species due to implementation of the RPA. The EPA shall:

Monitor any incidental take or surrogate measure of take that occurs from the action;

Ensure that permit applicants discharging to waters where ESA-listed species under NMFS' jurisdiction occur are aware of the ESA requirements; and

Report annually to NMFS OPR on the monitoring results from the previous year.

### **12.2.1 Terms and Conditions**

To be exempt from the prohibitions of section 9 of the ESA, the EPA must comply with the following terms and conditions. These conditions implement the reasonable and prudent measures described above.

- EPA will continue to provide NMFS with its most recent FIFRA risk assessment documents containing the current registered application rates, the expected environmental concentrations of pesticides in water resulting from those applications, and the toxicity information used to assess the risk to endangered and threatened species for all pesticides identified by PGP applicants that apply pesticides to areas with NMFS' Listed Resources

of Concern under Part 1.1.2.4, criteria D and F, of the 2021 PGP. This information will be provided as part of the annual reports.

- To insure implementation of the 2021 PGP, EPA must continue to monitor and evaluate the information obtained through its NOI and annual reports. In the NOI, the operator must identify where and when such discharges would occur, what those discharges would be, and of which use patterns these discharges would consist. NMFS will have the opportunity to review every discharge that might result in exposure to endangered and threatened species or designated critical habitat under NMFS' jurisdiction. NMFS will then determine whether the planned discharge or discharge(s) (future discharge or discharges in the case of Declared Pest Emergency Situations) meets the general permit's eligibility criteria that discharges will not likely result in any short or long term adverse effects to NMFS' Listed Resources of Concern, would meet it with additional conditions, or would not meet the eligibility criteria. The NOI process is designed to ensure that no individual discharge or combination of discharges will result in short- or long-term adverse effects to ESA-listed species or designated critical habitat, with the limited exception of discharges in response to a Declared Pest Emergency Situation. While the general permit does authorize discharges to address Declared Pest Emergency Situations prior to review of discharges by NMFS, this authorization has significant limits. The PGP specifies that a Declared Pest Emergency Situation is an event defined by public declaration by a federal agency, state, or local government, beginning less than ten days after identification of a pest problem posing significant risk to human health and the environment or significant economic loss. Once NMFS has reviewed a past or ongoing discharge pursuant to the NOI process for declared pest emergencies and provided its determination to EPA on whether the discharge(s) meets or could have met the eligibility criteria, any conditions or prohibitions applied by EPA remain in effect for the life of the permit for that discharge. This term and condition is designed to prevent repeated declarations of pest emergencies by the same operator, with a recurring 60-days of discharge authorization under the general permit without any conditions or prohibitions in place.
- EPA will meet with NMFS within 6 months of the issuance of the 2021 PGP to develop a strategy for analyzing and summarizing the annual reports that will be submitted by PGP dischargers. EPA will use this strategy to develop a summary report and continue to provide the report, and its source information to NMFS for each year of the permit term until the permit expires in 2026. The strategy will include measures to ensure continuity in the process in the event of staffing changes. The EPA will transmit the first report to NMFS in May of 2022. EPA will meet with NMFS within three weeks of transmitting the report to review the information and discuss permit compliance.

### 13 CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on ESA-listed species or designated critical habitat, to help implement recovery plans, or to develop information (50 C.F.R. §402.02).

The following conservation recommendations would provide information for future consultation involving EPA's issuance and implementation of the PGP. We recommend that EPA:

- Explore, within its authorities, ways to identify and estimate specific pesticides applied by the 97 percent of Decision Makers and Applicators covered by the PGP that are not required to file an NOI.
- Carry out educational outreach on pesticide risks to threatened and endangered species to pesticide users in high use agriculture and residential environments.
- Develop improved methods for characterizing exposure from use patterns covered by the PGP.
- Develop criteria that addresses when pesticide-contaminated sediment is an important route of exposure to aquatic organisms.
- Propose that pesticide registrants include "Endangered Species Concerns" in the Environmental Hazards section of pesticide labels.
- Continue to develop tools that assist Operators, pesticide Decision-makers, and Applicators avoid, reduce, or minimize effects to ESA-listed species and designated critical habitat associated with the discharges authorized under the PGP.
- Make the PGP permit, fact sheet, and implementation tools (web resources, NeT) available in Spanish.
- Leverage EPA's Healthy Watersheds Program to increase awareness among PGP permittees of the value of protecting watersheds and improve understanding of the range of management actions needed to avoid adverse impacts.
- Maintain informal dialogue with NMFS on the events and observations for PGP performance over the course of the permit term.

In order to keep NMFS' Endangered Species Cooperation Division informed of actions minimizing or avoiding adverse effects, or benefiting ESA-listed species or their habitats, the EPA should notify the NMFS Office of Protected Resources of any conservation recommendations they implement in their final action at the address listed on the cover letter to this document.

## 14 REINITIATION NOTICE

This concludes formal consultation on the United States Environmental Protection Agency's issuance of the Pesticides General Permit. As provided in 50 CFR §402.16, reinitiation of formal consultation is required and shall be requested by the Federal agency or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law and:

- (a) If the amount or extent of taking specified in the incidental take statement is exceeded;
- (b) If new information reveals effects of the action that may affect ESA-listed species or designated critical habitat in a manner or to an extent not previously considered;
- (c) If the identified action is subsequently modified in a manner that causes an effect to the ESA-listed species or designated critical habitat under NMFS' jurisdiction that was not considered in the biological opinion;
- (d) If a new species is listed or critical habitat is designated that may be affected by the identified action in a way not considered in this opinion;

A determination that Decision-makers who should file NOI for discharges to Waters of the United States containing ESA-listed species under NMFS' jurisdiction have failed to do so, or that Decision-makers incorrectly identify Criterion A or F as applicable to their proposed discharges shall constitute new information that reveals effects of the action that may affect ESA-listed species or designated critical habitat in a manner or to an extent not previously considered and require reinitiation pursuant to (b), above.

For those facilities with endangered species protection certifications in the NOI based on an existing formal consultation, any instance where the amount or extent of take specified in the ITS is exceeded requires that the United States Environmental Protection Agency immediately request reinitiation of Section 7 consultation.



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