



February 2019

ARMY CORPS OF ENGINEERS

Information on Shellfish Aquaculture Permitting Activities

Accessible Version

GAO Highlights

Highlights of [GAO-19-145](#), a report to congressional requesters

Why GAO Did This Study

Entities undertaking shellfish aquaculture activities (i.e., the breeding and harvesting of oysters, clams, and mussels) may need to submit an application to the Corps in certain circumstances for authorization to conduct these activities. The Corps authorizes such activities using various permits, as long as the activities comply with various environmental and other laws.

GAO was asked to review the Corps' process for authorizing shellfish aquaculture activity in U.S. coastal waters. This report describes, for 2012 through 2017, (1) the number and outcomes of the applications the Corps received for shellfish aquaculture activities and the types of permits the Corps used to authorize such activities, and (2) the experiences of permit applicants in selected districts in seeking Corps' authorization for their shellfish aquaculture activities.

GAO reviewed laws and permitting documents and analyzed data on the number, outcomes, and types of permits the Corps used for 2012 through 2017 from the Corps' permitting database and assessed its reliability. GAO also reviewed detailed information from a non-generalizable sample of 15 permit applications and interviewed the applicants and Corps officials from four Corps districts, selected to reflect variation in geographic location and shellfish activity; the information from the four districts is not generalizable to other Corps districts.

View [GAO-19-145](#). For more information, contact Anne-Marie Fennell at (202) 512-3841 or FennellA@gao.gov.

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Information on Shellfish Aquaculture Permitting Activities

What GAO Found

The U.S. Army Corps of Engineers (Corps) authorized most (87 percent) of the 3,751 shellfish aquaculture applications it received from 2012 through 2017, according to Corps data. Of the 19 Corps districts that have coastal waters within their geographic areas of responsibility, 17 districts received and authorized applications. The majority of those districts (13 of 17) authorized applications using Nationwide Permit 48, a type of permit intended to streamline the authorization process for shellfish aquaculture activities. Additionally, districts may add conditions to nationwide permits or develop region-specific permits to address state or regional environmental concerns. Of the four districts GAO reviewed in detail, two districts added regional conditions applicable to Nationwide Permit 48, such as prohibiting shellfish activity within submerged aquatic vegetation beds or saltmarshes.

Shellfish Farm Using Bags for Cultivation, Puget Sound, Washington



Source: GAO. | GAO-19-145

The 15 permit applicants from the four districts GAO reviewed had mixed views on their experiences with seeking authorization for their shellfish aquaculture activities. For example, 10 applicants across the four districts described the length of time to authorize their activities—ranging from 1 day to about 4 months—as reasonable, with several applicants indicating the Corps was efficient in reviewing their applications. In contrast, five applicants from three Corps districts said that the amount of time it took for the Corps to authorize their shellfish aquaculture activities—ranging from 18 days to about 8 months—was unreasonable. Corps officials from the four districts indicated they have taken some steps to help reduce authorization review time. For example, the four districts took steps to more efficiently conduct reviews under the Endangered Species Act. This has in turn helped reduce the Corps' time frames for issuing authorizations, according to Corps officials GAO interviewed. For instance, officials from one district said their review time declined from over 30 days to 1 to 2 days as a result of the change in the review process.

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Abbreviations

NOAA	National Oceanic and Atmospheric Administration
Corps	U.S. Army Corps of Engineers

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February 21, 2019

The Honorable John Barrasso, M.D.
Chairman
Committee on Environment and Public Works
United States Senate

The Honorable Peter DeFazio
Chairman
The Honorable Sam Graves
Ranking Member
Committee on Transportation and Infrastructure
House of Representatives

The Honorable James M. Inhofe
United States Senate

Shellfish aquaculture—the breeding, rearing, and harvesting of oysters, clams, and mussels—plays a vital role in supplying commercial seafood, supporting jobs in coastal communities, and contributing to healthy ecosystems. In 2016, U.S. shellfish growers produced 37 million pounds of oysters, 10 million pounds of clams, and 900,000 pounds of mussels at an estimated value of \$340 million, according to a National Oceanic and Atmospheric Administration (NOAA) report.¹ With a trade deficit in seafood, there has been growing interest in expanding U.S. seafood production, including generating new opportunities for shellfish aquaculture across U.S. coastal waters.² In 2011, NOAA established a National Shellfish Initiative in partnership with shellfish growers and others to increase shellfish populations through commercial production and conservation activities. Following the launch of the National Shellfish

¹National Oceanic and Atmospheric Administration, National Marine Fisheries Service, *Fisheries of the United States, 2017* (Silver Spring, Md.: Sept. 2018). According to the report, aquaculture production data lag the rest of the publication's data by 1 year, due to data availability.

²In 2017, the U.S. trade deficit in shellfish produced by aquaculture was \$255.4 million, according to the U.S. Department of Agriculture, Economic Research Service, "The Economics of Food, Farming, Natural Resources, and Rural America" (May 3, 2018).

Initiative, several states developed state initiatives to further promote shellfish aquaculture production.³

Shellfish aquaculture activities often involve a complex regulatory path. Various local, state, tribal, and federal requirements may apply to aquaculture activities. For example, state and local authorities may require licenses, aquatic leases, and food safety provisions, among other things, for commercial aquaculture activities. At the federal level, the U.S. Army Corps of Engineers (Corps), under section 10 of the Rivers and Harbors Act of 1899 and section 404 of the Clean Water Act, issues permits respectively for activities affecting navigable waterways and discharges of dredged or fill material into waters of the United States, which can include shellfish aquaculture activities in coastal waters.⁴ The Corps authorizes activity under these permits subject to, among other things, a determination that a regulated activity is not contrary to the overall public interest, including consideration of compliance with other applicable federal laws, such as the Endangered Species Act and the National Environmental Policy Act.⁵ Entities who wish to undertake shellfish aquaculture activities may need to submit an application to the Corps for written authorization to conduct such activities under permits issued by the Corps.

You asked us to review the Corps' process for authorizing shellfish aquaculture activity in U.S. coastal waters. This report describes, for 2012 through 2017, (1) the number and outcomes of the applications the Corps received for shellfish aquaculture activities and the types of permits the

³For example, Washington State launched an initiative in 2011 to promote increased commercial shellfish aquaculture production in the Puget Sound and coastal shores across the state. See State of Washington, Governor's Legislative and Policy Office: *Washington Shellfish Initiative – Phase II Work Plan* (Olympia, Wash.: January 2016). This initiative was the first such effort in the nation and is to support goals to enhance shellfish resources in coastal waters, including water quality improvements to support recreational, tribal, ceremonial, subsistence, commercial, and nontribal commercial harvest. Other states' coordinating initiatives with NOAA include Alaska, Connecticut, North Carolina, and Rhode Island.

⁴33 U.S.C. §§403,1344.

⁵Under section 7 of the Endangered Species Act, the Corps must consult with the Department of the Interior's U.S. Fish and Wildlife Service and the Department of Commerce's National Marine Fisheries Service, as appropriate, if the Corps determines that the proposed federal action may affect a species listed as threatened or endangered, the designated critical habitat for a listed species, or both. 16 U.S.C. § 1536(a)(2). The National Environmental Policy Act requires federal agencies to evaluate the potential environmental effects of proposed projects on the human environment. 42 U.S.C. § 4332.

Corps used to authorize such activities, and (2) the experiences of permit applicants in selected districts in seeking Corps authorization for their shellfish aquaculture activities.

To conduct our work, we reviewed relevant federal laws, regulations, and Corps documents on permitting, and interviewed officials from Corps headquarters. We also selected a non-generalizable sample of four Corps districts for a closer examination of the nature of shellfish aquaculture activities and the types of permits used by districts to authorize such activity. The four districts were Baltimore, New Orleans, Norfolk, and Seattle. We selected these districts based on several factors, including geographic region, the commercial value of shellfish cultivated, and the type and level of shellfish aquaculture activity authorized by the Corps. We conducted site visits from July 2017 to March 2018 to each of the four Corps districts to observe aquaculture activities and learn about the types of permits the districts use to authorize shellfish aquaculture activities. During our site visits, we interviewed state agency officials in Maryland, Louisiana, Virginia, and Washington involved in permitting at the state level to learn about state permitting requirements and coordination with the Corps districts on various aspects of shellfish aquaculture permitting. We also interviewed other stakeholders such as federal agencies involved in permitting activities, including regional officials from the Department of the Interior's U.S. Fish and Wildlife Service and NOAA's National Marine Fisheries Service, within the Department of Commerce. The information we obtained from the four districts and stakeholders is not generalizable to other Corps districts or stakeholders but illustrates the variation in the Corps' shellfish aquaculture permitting at the district level.

To examine the number, outcomes, and types of permits the Corps used to authorize shellfish aquaculture activity, we obtained and analyzed data from the Corps' permitting database: the Operations and Maintenance Business Information Link Regulatory Module 2. Specifically, we analyzed nationwide data on shellfish aquaculture applications submitted to Corps district offices with a decision date from January 1, 2012, through October 26, 2017, which were the most recent data available at the time of our review.⁶ These applications covered various types of shellfish aquaculture activities, including commercial operations, as well as oyster reef

⁶The decision date is the date the Corps district makes a decision to authorize, withdraw, or deny an entity's application for authorization of shellfish aquaculture activities.

restoration activities.⁷ For all Corps districts, we analyzed the number of applications received, authorized, withdrawn, or denied, and under which type of permit an application was submitted to the Corps.⁸ We took steps to determine the reliability of the Corps' permitting data, including comparing the data to the administrative files for three to five randomly selected applications from four districts we reviewed. We also reviewed agency guidance on data entry and interviewed agency officials knowledgeable about the Corps' permitting data, including officials from the four districts and headquarters. Based on these steps, we found the data to be sufficiently reliable to provide nationwide and district-level summary information on applications, authorizations, and the types of permits the Corps used during the period of our review.

To determine the experiences of permit applicants in selected districts in seeking Corps authorization for their shellfish aquaculture activities, we randomly selected 15 applications submitted by different applicants during the time period of our review to the four Corps districts in our review. We reviewed the documents included in the Corps' administrative files and conducted semi-structured interviews with each of the applicants and Corps officials responsible for reviewing these applications about their experiences with the application process. We then analyzed and categorized the interview responses based on common themes that we

⁷The Corps' permitting database contains information on shellfish activities for which entities sought authorization from relevant Corps districts. These activities included commercial shellfish operations, activities to create new or restore former oyster reefs, and shellfish aquaculture for research. For the purposes of this report, we refer to all shellfish-related activities included in the Corps' permitting database as shellfish aquaculture activities.

⁸Entities seeking authorization may include individuals, businesses, organizations (such as non-profit organizations undertaking restoration activities), or other groups, according to Corps officials. Not all shellfish aquaculture activity requires entities to notify and submit an application for Corps authorization, as discussed in this report. Because the Corps does not collect data on shellfish aquaculture activities in which entities do not seek Corps authorization, such activities were not part of our analysis. We also obtained nationwide data on time frames for issuing authorizations from the Corps' permitting database, which the agency uses in part for managing its workload. However, we determined that an analysis of the time frames for permit issuance across the districts over the period of our review would not provide meaningful information for various reasons. For instance, authorizing shellfish aquaculture activities is one of many permitting responsibilities that the Corps balances and prioritizes. In addition, general permits are cyclical, covering up to 5-year periods, but different types of general permits may have differing start and end dates, which can impact the Corps' workload at different times. As a result, we did not include an analysis of time frames in our review given the variety of factors that can impact time frames.

identified across the interviews. The information we obtained from the permit applicants and Corps officials we interviewed is not generalizable to other applicants, but illustrates the types of experiences permit applicants in the four districts had in seeking authorization for their shellfish aquaculture activities. We also interviewed Corps officials in the four districts and headquarters to identify any steps the Corps has taken to address difficulties raised by the permit applicants and reviewed documentation related to these steps. Appendix I presents a more detailed description of our objectives, scope, and methodology.

We conducted this performance audit from June 2017 to January 2019 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

According to NOAA documentation on domestic aquaculture production, shellfish aquaculture represents a large and growing segment of seafood production in the United States, with aquaculture operations present in all coastal regions of the United States (see table 1). The economic value of shellfish varies based on factors such as market, location, and species. For example, one species of clam, the geoduck—a large saltwater clam found in the Pacific Northwest—has sold for as much as \$100 per pound in the Asian market, where it is valued as a luxury food.

Geoduck Clams



Geoducks ready to go to market.



Restaurant-prepared geoduck sashimi.

Geoduck clams are the world's largest burrowing clam, generally weighing between 1 and 3 pounds, with a shell length that can exceed 7 inches. Geoducks can be found in the wild in the Pacific Northwest, and growers in Washington State have cultivated geoducks through aquaculture on a commercial scale since the 1990s. Washington State produced about 90 percent of farmed geoducks globally in 2013, according to a report by the University of Washington. In Asian markets, geoducks are sought-after in high-end seafood restaurants where they can be prepared for cooked or raw consumption.

Source: GAO. | GAO-19-145

Table 1: Estimated Volume and Value of Shellfish Aquaculture Produced in the United States, 2016^a

Region	Volume (millions of kilograms) ^b	Value (\$ million)
Atlantic	9.7	\$120.7
Gulf	24.9	86.8
Pacific	12.5	132.6
Total	47.1	\$340.1

Source: National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service, Fisheries of the United States, 2017 (Silver Spring, MD, Sept. 2018). | GAO-19-145

^aNOAA collects information annually on key recreational and commercial domestic fisheries by species; information for 2016 was the most recently available as of December 2018.

^bVolume is reported in shellfish meat weight.

NOAA and scientific research have recognized the role that shellfish aquaculture can play in supporting healthy coastal ecosystems. For example, scientific research has shown that the filter feeding activity of oysters can help improve water clarity and quality by reducing concentrations of suspended materials such as algae. Additionally, research has demonstrated that oyster reefs can serve as natural breakwaters that may protect shorelines against damage from wind, waves, and flooding. In contrast, some effects of shellfish aquaculture are less well known or understood. For instance, there are knowledge gaps of the effects that aquaculture activities may have on submerged aquatic vegetation, according to NOAA reports.⁹

⁹National Oceanic and Atmospheric Administration, National Marine Fisheries Service, West Coast Region, *Washington Eelgrass and Shellfish Aquaculture Workshop Report* (Seattle, Wash.: April 11, 2017); *Endangered Species Act Section 7(a)(2) Biological Programmatic Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation, Washington State Commercial Shellfish Aquaculture and Restoration Programmatic*, National Marine Fisheries Service Consultation No. WCR-2014-1502 (Seattle, Wash.: Sept. 2, 2016).

Oyster Cultivation

Oysters prepared on the half-shell.

Depending on the intended method of consumption, growers may use a specific type of cultivation to grow oysters. For oysters served on the half-shell, growers may cultivate oysters in cages or bags in the water column and tumble or rotate the oysters regularly as they grow. Tumbling the oysters strengthens their shells and also causes them to grow in a more desirable shape. Agitating growing oysters prevents the oyster from growing wide and flat by chipping away at new growth around the shell and causing the oyster to develop a deeper “cup” or pocket for the oyster to grow within.

Source: GAO. | GAO-19-145

In general, commercial growers cultivate shellfish by two methods: on the bottom of coastal waters, or in the water column, which extends from the surface to the bottom of those waters. Commercial growers harvest oysters and clams grown on the bottom of waters by hand or by mechanical means such as dredging, raking, or other tilling activities. Commercial growers who cultivate shellfish within the water column generally grow them in racks or cages suspended in the water (see fig. 1). Growers use different methods of cultivation depending on the target commercial market, the environment for cultivation, and the need to protect the shellfish from predatory species such as fish or crabs.

Figure 1: Shellfish Farm Using Bags for Cultivation



Source: GAO. | GAO-19-145

Oyster bags at low tide, which are submerged in the water column during high tide, Puget Sound, Washington.

Shellfish aquaculture activities can be subject to various requirements at local, state, tribal, and federal government levels. For example, local authorities in the county, town, or other jurisdiction where shellfish activities are planned may require a shellfish grower to ensure compliance with local policies before commencing cultivation activities. In addition, some states have specific regulations that apply to shellfish aquaculture activities. These can include, for example, a certification that

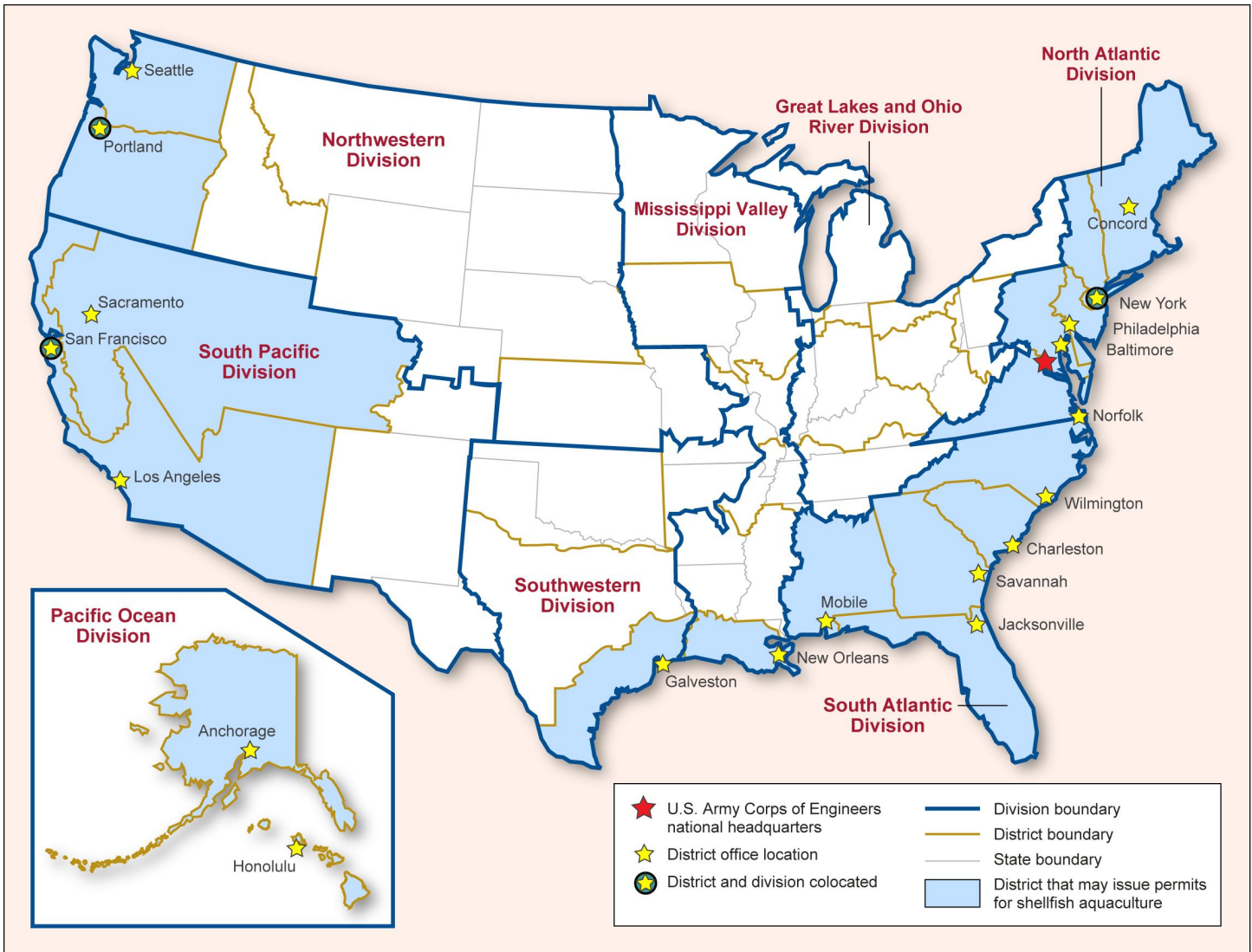
aquaculture activities meet state water quality standards, or a requirement that the activities are covered by an aquatic lease. Treaties grant certain tribes the rights to a portion of shellfish harvest in a particular area.

At the federal level, a shellfish grower may need authorization from the Corps to undertake shellfish aquaculture activities. The Corps is responsible for ensuring compliance with Section 10 of the Rivers and Harbors Act of 1899, which requires authorization for structures in or work affecting navigable waters of the United States, or both, that could interfere with navigation. Structures used in shellfish aquaculture activities may include buoys, floats, racks, nets, and lines. The Corps is also responsible for ensuring compliance with section 404 of the Clean Water Act, which requires authorization for the discharge of dredged or fill material, or both, into waters of the United States.¹⁰ Shellfish aquaculture activities such as seeding, rearing, cultivating, transplanting, and harvesting shellfish may affect waters of the United States, and the Corps reviews these activities in accordance with applicable laws and regulations.

Nineteen Corps districts have coastal waters within their geographic areas of responsibility and therefore may authorize shellfish aquaculture activities (see fig. 2). Under the direction of eight regional division offices and headquarters, the district offices are responsible for reviewing, authorizing, and ensuring appropriate levels of coordination for shellfish aquaculture activities in their districts.

¹⁰33 U.S.C. § 1344(a). Dredged material refers to material that is excavated or dredged from waters of the United States. Fill material refers to material used for the primary purpose of replacing any portion of a water of the United States with dry land or changing the bottom elevation of a water body.

Figure 2: U.S. Army Corps of Engineers Districts that May Authorize Shellfish Aquaculture Activities



Sources: U.S. Army Corps of Engineers; Map Resources (map). | GAO-19-145

Note: Highlighted district offices have coastal waters within their geographic areas of responsibility and may authorize shellfish aquaculture activities, although not all districts necessarily authorize such activities every year.

In authorizing shellfish activities, the Corps must implement various legal requirements, which may entail consulting or coordinating with other federal agencies, states, tribes, the public, and other parties. These legal requirements include:

- **National Environmental Policy Act.** Under the act, the Corps generally must evaluate the potential environmental effects of projects proposed for approval (e.g., by permit), such as shellfish aquaculture activities, by preparing either an environmental assessment or a more detailed environmental impact statement.¹¹
- **Endangered Species Act.** Under section 7 of this act, if a proposed Corps action may affect a listed species or designated critical habitat, formal consultation is required with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service.¹² The Corps may also undertake programmatic consultations with these agencies, which generally combine reviews for similar activities into one consultation.
- **Magnuson-Stevens Fishery Conservation and Management Act.** Under this law, the Corps must consult with the National Marine Fisheries Service if a proposed federal action may adversely affect essential fish habitat that a regional fisheries management council has identified.¹³
- **National Historic Preservation Act.** Under section 106 of the act, the Corps must take into account the effects of shellfish aquaculture activities on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such activities. The Corps must also consult with the relevant state or tribal historic preservation officer, as appropriate.

The Corps uses different types of general and individual permits to authorize a wide range of activities, including shellfish aquaculture activities, as shown in table 2.

¹¹The National Environmental Policy Act requires federal agencies to evaluate the potential environmental effects of proposed projects on the human environment. Agencies prepare an environmental impact statement when a project will have a potentially significant impact on the environment. They may prepare an environmental assessment to determine whether a project will have a significant potential impact. If a project fits within a category of activities determined to have no significant impact—a categorical exclusion—then an environmental impact statement or environmental assessment is generally not necessary.

¹²Critical habitat includes specific geographic areas, whether occupied by listed species or not, that are determined to be essential for the conservation and management of listed species, and that have been published in the *Federal Register* after public notice and an opportunity for comment. The Corps may informally consult with these agencies as appropriate, to determine whether its proposed action may affect listed species or critical habitat.

¹³Under the act, the term “essential fish habitat” means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.

Table 2: Types of Permits Used by the U.S. Army Corps of Engineers (Corps) to Authorize Shellfish Aquaculture Activity

Permit type	Description	Permit category
General	Authorize pre-approved categories of activities that are similar in nature and cause only minimal individual and cumulative adverse environmental effects; activities authorized for up to 5 years, after which the Corps may review, modify, and renew for periods of up to 5 years.	<ul style="list-style-type: none"> • Nationwide permits authorize pre-approved categories of activities nationwide that Corps districts may use at their discretion; districts may include additional terms or conditions with their use, such as conditions based on environmental or other public interest concerns specific to regions or states within the district • Programmatic or regional permits authorize pre-approved categories of activities within specific regions or Corps' districts, which generally include terms and conditions based on environmental or other public interest concerns specific to regions or states
Individual	Authorize an individual activity, including those that have not been pre-approved under a general permit; activities authorized for a time period specified in the permit granted by the Corps district.	<ul style="list-style-type: none"> • Standard permits authorize individual, site-specific activities • Letters of permission authorize minor activities, usually limited to activities covered by section 10 of the Rivers and Harbors Act of 1899

Source: GAO analysis of statutes, regulations, and Corps' permitting documents. | GAO-19-145

Note: The Corps uses these types of permits to authorize a wide range of activities including shellfish aquaculture activities. Specifically, the Corps may issue general or individual permits for certain activities in waters of the United States and ocean waters under a number of statutes, including section 404 of the Clean Water Act, sections 9 and 10 of the Rivers and Harbors Act of 1899, and section 103 of the Marine Protection, Research, and Sanctuaries Act.

In some cases, if an entity's shellfish aquaculture activities comply with the terms and conditions laid out in a general permit, then the entity may undertake the activities without written authorization from the Corps. In such instances, according to its permitting guidance, the Corps would consider those activities to be authorized under the specified general permit.

In other cases, however, entities who wish to undertake shellfish aquaculture activities under a general permit may need to submit an application to the Corps for written authorization to conduct such activities. For example, some terms and conditions may require entities to notify the Corps if their proposed activities may affect areas inhabited by submerged aquatic vegetation or endangered species or their designated critical habitats. In such instances, entities must submit applications to the Corps with required information, including the location and technical information about the proposed activity. Based on Corps guidance, the agency then assesses the applicant's proposed activities to determine whether they comply with all of the general permit's terms and conditions.

If the Corps verifies compliance, it issues a written authorization for the entity to undertake the proposed activities.¹⁴

In March 2007, the Corps developed a nationwide permit—Nationwide Permit 48—to help streamline the process for authorizing existing commercial shellfish aquaculture activities, effective for a 5-year period.¹⁵ In 2012, the Corps revised and reissued Nationwide Permit 48 to, among other things, authorize new activities and to clarify some reporting requirements. The Corps most recently reissued Nationwide Permit 48 in March 2017, which defined the activities that constitute new commercial aquaculture activities, among other revisions, and remains in effect until March 2022.¹⁶ Corps districts may also develop and use other types of programmatic and regional general permits to authorize shellfish aquaculture activities. Generally, entities that submit an application and receive authorization under a general permit need to resubmit their application upon expiration of their permit to re-seek authorization to continue their aquaculture activities.

¹⁴For general permits, entities submit applications to the Corps to request verification that a proposed activity conforms to the terms and conditions of the general permit. Entities may also submit applications to request an individual permit for a proposed activity that cannot conform to the terms and conditions of a general permit. The Corps refers to applications authorized by a general permit as “verified” and to applications authorized by individual permits as “issued.” For purposes of this report, we refer to both types of applications as permit applications, and authorizations for both types of applications as permit authorizations.

¹⁵At the time of our review, the Corps had 52 nationwide permits in place to authorize a wide range of activities such as survey activities, utility line installations, hydropower projects, and agricultural and mining activities. Nationwide Permit 48 is the only nationwide permit specific to commercial shellfish aquaculture activities. The Corps authorizes activities under nationwide permits subject to, among other things, a determination that a regulated activity is not contrary to the overall public interest, including consideration of compliance with other applicable federal laws, such as the Endangered Species Act and the National Environmental Policy Act.

¹⁶The 2017 Nationwide Permit 48 defined a “new commercial shellfish aquaculture operation” as an operation in an area where commercial shellfish aquaculture activities had not been conducted during the past 100 years.

The Corps Authorized Most of the 3,751 Applications Received for Shellfish Aquaculture Activities from 2012 through 2017 Using Various Types of Permits

Based on our analysis of data from the Corps' permitting database, we found that the Corps authorized most of the 3,751 shellfish aquaculture applications it received from 2012 through 2017 using various types of general and individual permits. Of the 19 Corps districts that have coastal waters within their geographic areas of responsibility, 17 Corps districts received shellfish aquaculture applications, with the Seattle District receiving the most applications and the New England District receiving the next highest amount (see table 3). The number of applications does not correspond to the level of shellfish activity in a particular district, however, as some activities may be authorized under a general permit without triggering the need for an entity to submit an application for Corps authorization, as previously noted.¹⁷

Table 3: Outcomes for Shellfish Aquaculture Applications Received by the U.S. Army Corps of Engineers, by District (Jan. 1, 2012 - Oct. 26, 2017)

District	Outcome Denied	Outcome Withdrawn	Outcome Authorized	Total Received
Alaska	0	3	11	14
Baltimore	3 ^a	15	161	179
Charleston	0	1	68	69
Galveston	0	3	6	9
Jacksonville	0	2	5	7
Los Angeles	0	1	4	5
Mobile	0	11	26	37
New England	0	81	761	842

¹⁷Also, some applications and authorizations in the Corps database may reflect the same activity. For example, after receiving an authorization for an activity, an entity subsequently may want to make a change to its operations, such as using a different gear type or cultivating a different species. In such an instance, the entity would modify and resubmit its application, which the Corps would count as a separate application in its permitting database. In addition, the 2012 through 2017 time period covers portions of two 5-year permitting periods for nationwide permits. As a result, some entities may have submitted more than one application to the Corps for the same project.

District	Outcome Denied	Outcome Withdrawn	Outcome Authorized	Total Received
New Orleans	1	1	30	32
New York	0	5	90	95
Norfolk	0	6	84	90
Philadelphia	0	2	30	32
Portland	0	0	3	3
Sacramento	0	0	1	1
San Francisco	0	1	6	7
Seattle	0	334	1,972 ^b	2,306
Wilmington	0	0	23	23
Total	4	466	3,281	3,751

Source: GAO analysis of the U.S. Army Corps of Engineers permitting database (Operations and Maintenance Business Information Link Regulatory Module 2). | GAO-19-145

^aThe Baltimore District denied without prejudice three applications after the State of Maryland denied the corresponding, required shellfish lease applications at the state level.

^bFrom January 2012 through March 2017, some applicants received two authorizations from the Seattle District, according to Corps District officials. Second authorizations were sent out to some applicants to describe Section 7 coverage under the Endangered Species Act based on completion of a programmatic consultation in 2016 with the National Marine Fisheries Service and U.S. Fish and Wildlife Service. As a result, the number of permit authorizations reflected in the database does not necessarily reflect the number of applications authorized under the 2012 Nationwide Permit. The actual number of applications receiving authorization for this time period was about 980, according to Corps Seattle District officials.

Of the 3,751 applications the Corps received from 2012 through 2017, the Corps authorized 3,281, or about 87 percent of the applications, according to our analysis of Corps data. Four applications (less than 1 percent) were denied, and the remaining 466 applications (about 12 percent) were withdrawn. Applications were denied or withdrawn for a variety of reasons. For example, Corps officials we interviewed said that the Corps would deny an application if the applicant was denied the necessary approvals from state or other relevant regulatory authorities. An application may have been withdrawn, according to the Corps officials, if the applicant decided to seek an individual rather than a general permit or did not provide sufficient information in its application for the Corps to determine that the applicant could meet the terms and conditions of the requested permit, among other reasons.

According to Corps data, the applications the Corps authorized from 2012 through 2017 corresponded to 2,631 unique shellfish aquaculture

projects.¹⁸ Almost half of these projects (49 percent) were located in the Seattle District, about 29 percent were located in the New England District, and the remaining 22 percent were spread across 15 other coastal districts.

The majority of Corps districts (13 of 17) authorized shellfish aquaculture applications using Nationwide Permit 48, according to our analysis of Corps data. Specifically, nearly two-thirds of the applications (2,138 of 3,281) were authorized under Nationwide Permit 48, as shown in table 4. Four districts did not authorize activity under Nationwide Permit 48, but instead used a different type of general permit to authorize shellfish aquaculture activity. For example, the New England District, which includes the states of Connecticut, Rhode Island, and Maine, authorized shellfish activity using state-specific general permits. The majority of districts (13 of 17) also authorized shellfish activities under individual permits, but overall individual permits represented about 3 percent (85 of 3,281) of authorized activity.

Table 4: Corps Shellfish Aquaculture Authorizations by Permit Type and Corps District (Jan. 1, 2012 to Oct. 26, 2017)

District	Nationwide Permit 48	Other general permit ^a	Individual permit ^b	Total
Alaska	1	6	4	11
Baltimore	7	119	35	161
Charleston	12	53	3	68
Galveston	0	5	1	6
Jacksonville	2	3	0	5
Los Angeles	1	1	2	4
Mobile	17	5	4	26
New England	0	740	21	761
New Orleans	0	24	6	30
New York	88	1	1	90
Norfolk	3	81	0	84
Philadelphia	26	3	1	30
Portland	2	0	1	3

¹⁸A project refers to shellfish activities in a defined area for which an entity is seeking Corps authorization to conduct those activities. The number of shellfish projects does not necessarily correspond to the number of applications or authorizations, as one project could correspond to more than one application or authorization.

District	Nationwide Permit 48	Other general permit ^a	Individual permit ^b	Total
Sacramento	0	1	0	1
San Francisco	5	1	0	6
Seattle	1,960 ^c	7	5	1,972
Wilmington	14	8	1	23
Total	2,138	1,058	85	3,281

Source: GAO analysis of U.S. Army Corps of Engineers' (Corps') permitting database (Operations and Maintenance Business Information Link Regulatory Module 2). | GAO-19-145

Note: The totals included in this table are for authorized applications and do not include withdrawn or denied applications. The totals also do not include shellfish aquaculture activities for which an application was not submitted to the Corps.

^aOther general permits include nationwide permits other than Nationwide Permit 48 or regional or programmatic permits.

^bIndividual permits include standard permits and letters of permission.

^cFrom January 2012 through March 2017, some applicants received two authorizations from the Seattle District, according to Corps District officials. Second authorizations were sent out to some applicants to describe Section 7 coverage under the Endangered Species Act based on completion of a programmatic consultation in 2016 with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service. As a result, the number of permit authorizations reflected in the database does not necessarily reflect the number of applications authorized under the 2012 Nationwide Permit. The actual number of applications receiving authorization for this time period was about 980, according to Corps Seattle District officials.

While many applications were authorized under Nationwide Permit 48, we found that Corps districts added conditions to this or other general permits to account for state or regional environmental or other relevant regulatory concerns.¹⁹ For example, two districts we reviewed—Norfolk and Seattle—generally used Nationwide Permit 48 to authorize shellfish aquaculture activities in their districts, but added conditions to the nationwide permit to address concerns specific to their regions as follows:

- **In the Norfolk District**, the Corps developed several regional conditions applicable to the Nationwide Permit 48 issued in March 2017.²⁰ These regional conditions prohibit activity within submerged aquatic vegetation beds or saltmarshes and prohibit removing or

¹⁹Corps division engineers may approve regional conditions that apply to each of the 52 nationwide permits issued within Corps districts, as well as regional conditions that apply to specific nationwide permits, such as Nationwide Permit 48. Shortly after Corps headquarters publishes proposed nationwide permits in the *Federal Register* for public comment, federal regulations call for the districts to issue public notices to solicit comments on any proposed regional conditions applicable to permits in those districts, which may then be approved by the districts' respective divisions.

²⁰Seven of eight regional conditions are specific to Nationwide Permit 48, and the remaining regional condition also applies to other specified nationwide permits.

damaging vegetation in these areas, among other things. Norfolk District officials said that these regional conditions align with requirements under Virginia state regulations. As long as shellfish aquaculture growers meet those requirements, according to these officials, then growers may conduct their projects without a state permit or submitting an application to the Corps for authorization.²¹ Because these growers do not submit applications to either the state of Virginia or the Corps for authorization for their activities, district officials said they do not know how much shellfish activity may be occurring under Nationwide Permit 48 in the district, but Virginia is among the largest shellfish producing states.²²

- **In the Seattle District**, the Corps also developed several regional conditions applicable to Nationwide Permit 48.²³ For example, one regional condition prohibits harvesting clams using certain hydraulic harvesting equipment. Any entity seeking to undertake shellfish aquaculture activities in the Seattle District needs to submit an application to the Corps for authorization, district officials explained. According to the National Marine Fisheries Service, almost all locations for shellfish activity in Washington State are designated as critical habitat for one or more threatened or endangered species listed under the Endangered Species Act. The presence of listed species or their designated critical habitats is one trigger under nationwide permits, including Nationwide Permit 48, requiring entities to submit an application to the Corps for review and authorization for conducting those activities.²⁴

²¹Corps Norfolk District officials said that shellfish aquaculture activities that do not fit the parameters of Nationwide Permit 48 may be authorized using other permit types, such as the district's Regional General Permit 19, which covers shoreline, aquaculture, and other activities.

²²According to the U.S. Department of Agriculture's most recent shellfish aquaculture national survey, completed in 2014, Virginia had the second highest sales of shellfish in the country in 2013, totaling \$41.5 million in sales that year.

²³To accompany the Nationwide Permit 48 issued in March 2017, the Seattle District developed one specific regional condition. In addition, the district developed 11 regional general conditions that apply to Nationwide Permit 48.

²⁴In 2016, the National Marine Fisheries Service and U.S. Fish and Wildlife Service in a Section 7 biological opinion identified a number of conservation measures that apply to Washington State inland marine waters for compliance with the Endangered Species Act. Shellfish activities that do not employ the conservation measures where applicable are potentially liable under the Endangered Species Act unless they are covered under a separate Endangered Species Act consultation and Corps permit.

In certain instances, Corps headquarters officials said that some districts may find that a nationwide permit, such as Nationwide Permit 48, does not address the activity or requirements in their districts. Corps officials said that in such cases a district may have a region-specific general permit that more closely follows state or local requirements. Two Corps districts we reviewed—New Orleans and Baltimore—generally used or have used regional permits to authorize shellfish aquaculture activities in their regions. Specifically,

- **In the New Orleans District**, when Nationwide Permit 48 was first issued in 2007, Corps officials said that the district was generally using a programmatic permit that incorporated existing Louisiana regulations on coastal development. The New Orleans District was generally using this programmatic permit to authorize shellfish aquaculture and other coastal activities in Louisiana. Among the conditions in the permit are prohibitions on structures with proximity to flood control and hurricane damage risk-reduction levees, and activities that would impact barrier islands, bird rookeries, and coral reefs—coastal areas of Louisiana that are regarded by the state as environmentally sensitive. As a result, district officials said they continue to use their programmatic permit to allow the state of Louisiana a lead role in regulating coastal activities.
- **The Baltimore District** used a regional permit to authorize shellfish aquaculture activities until August 2016. According to district officials, Maryland had few existing commercial shellfish aquaculture projects before 2010, and at that time the Corps restricted the use of Nationwide Permit 48 to existing shellfish aquaculture activities. Any new activities required an individual permit, which involved a more extensive review process. The state of Maryland began to promote shellfish aquaculture in 2010, and many new growers entered the industry, district officials said. In response, the Baltimore District created a regional permit for new shellfish aquaculture projects, which district officials said allowed for a more streamlined process than the process needed for an individual permit. The regional permit expired in August 2016; instead of updating it, the Baltimore District replaced it with Nationwide Permit 48. Nationwide Permit 48 issued in March 2012 and in March 2017 covers new as well as existing shellfish aquaculture activities, and district officials said that there was no longer a need to use their regional permit and could use the Nationwide Permit 48 upon expiration of the regional permit.

Applicants Across the Four Selected Districts Had Mixed Views on their Experiences in Seeking Authorization for their Shellfish Activities

Through our interviews with 15 permit applicants from the four districts we reviewed and with Corps district and headquarters officials, we found that applicants had mixed views on their experiences in seeking authorization for their various shellfish aquaculture activities. Overall, 10 of the 15 applicants across the four districts said they understood the application process. Several of these applicants said that their knowledge stemmed from previous experience seeking authorization from the Corps or from information provided by state or Corps officials. Similarly, 10 applicants from the four districts described the length of time the Corps took to authorize their activities as reasonable, with several applicants commenting that the Corps was efficient in reviewing and authorizing their application. For these applications, the length of time ranged from 1 day to about 4 months.²⁵

In contrast, 11 permit applicants across the four districts cited facing one or more difficulties with various aspects of the application process. For example, 5 of the 15 applicants indicated they were unclear about what steps were involved in the application process such as the information they needed to submit as part of the application or how to meet the requirements outlined in the permit terms and conditions. One applicant in the Seattle District said it was difficult to know how to address a condition in Nationwide Permit 48 that restricts shellfish activity in areas adjacent to potential spawning habitat for certain species of forage fish.²⁶ When seeking clarification from the Corps, he said Corps officials could not

²⁵We reviewed data on the length of time it took the Corps to issue authorizations for the 15 applications we reviewed from the Corps' permitting database and the administrative files associated with these applications. The time frame for authorization was based on the date the Corps received a completed application and the date it issued an authorization to the applicant.

²⁶In a programmatic consultation issued by the National Marine Fisheries Service and the U.S. Fish and Wildlife Service in 2016, the services identified a number of conservation measures for compliance with the Endangered Species Act, including the restriction of shellfish cultivation in areas adjacent to potential spawning habitat for certain species of forage fish.

specify how far away from spawning habitat his project should be located. Seattle Corps District officials said the Corps has been reviewing how to consistently define adjacent spawning areas, among other requirements, but had not yet made a determination when this application was reviewed.

Eight of the 15 permit applicants from three Corps districts expressed concern that they did not receive sufficient information about the status of their application after submitting it to the Corps for review. Two of these applicants said they contacted the Corps to get information on the status of their applications but that sometimes it was difficult to reach Corps officials. The applicants said their shellfish activities had time-sensitive needs and that not knowing the status or time frames associated with the permitting process was problematic. For example, one permit applicant in the New Orleans District said not knowing when permitted activity would be authorized jeopardized the ability to take advantage of the naturally occurring seasonal oyster spawn that was critical to the viability of the project. New Orleans District officials agreed that it may be difficult for applicants to quickly determine the status of their applications, as a phone call to the Corps is the only way to obtain such information. Officials from two districts we reviewed said their goal is to generally respond to inquiries within 2 days, but this is not always possible due to heavy workloads or staffing constraints.²⁷ For example, in the New Orleans District, officials said the workload across their permitting program is high, with a typical project manager responsible for reviewing 35 to 40 permit applications at any one time.

In addition, five permit applicants from three Corps districts said they believed that the amount of time it took for the Corps to authorize their shellfish aquaculture activities was unreasonable. For these applications, the length of time ranged from 18 days to about 8 months. One applicant from the Seattle District who waited about 8 months to receive authorization for the application in 2012 said that he continued his shellfish operations while waiting authorization, but was concerned that operating without the Corps' authorization put his operations at risk from

²⁷ Corps headquarters officials said that as of July 2018 they were working to enhance the agency's permitting database for applicants that submit individual permits, so that those applicants would be able to access and determine the status of their applications. For example, applicants would be able to see whether an application is pending based on a consultation under the Endangered Species Act.

potential legal challenges.²⁸ Officials in the Seattle District said they have seen an increase in applications for shellfish aquaculture authorizations over the last several years, which has significantly increased their workload and, in some cases, affected their ability to issue authorizations in a timely manner. Corps officials from headquarters and the four districts said it is generally their goal to authorize applications within 60 days, but limited staffing, heavy workloads, and the need to coordinate or consult with other federal, state, or tribal agencies may prevent them from doing so.

Corps officials from the four selected districts have taken some steps to address difficulties applicants have experienced with understanding permit terms and conditions. For example, officials in the Seattle and Baltimore Districts have taken steps to help explain some permit terms and conditions. In Seattle, district officials said they have held quarterly meetings since 2015 for interested applicants and other stakeholders to address concerns or clarify certain Nationwide Permit 48 conditions. Seattle District officials said that attendees generally provided positive feedback about these quarterly meetings and that they plan to continue holding such meetings to discuss permit conditions or other issues that may arise. Similarly the Baltimore District has held aquaculture workshops on an as-needed basis for applicants and other stakeholders to clarify permit conditions. For example, in September 2016, the Baltimore District held a workshop to explain a permit condition intended to prevent endangered sea turtles from entanglements in aquaculture gear. One applicant we interviewed said this workshop was helpful and provided a better understanding of permit conditions. Officials from the Baltimore District said that they plan to conduct additional aquaculture workshops in 2019 and will invite representatives from the Maryland Department of Natural Resources to participate.

²⁸According to Corps officials in the Seattle District, the National Marine Fisheries Service and U.S. Fish and Wildlife Service determined that the programmatic consultation completed for Nationwide Permit 48 in 2007 was not valid for Nationwide Permit 48 issued in 2012. As a result, the district initiated a new Section 7 consultation with the services. Entities who had submitted applications to the Seattle Corps District for Nationwide Permit 48 in 2012 were allowed to continue operations while the Section 7 consultation was underway. Once the Section 7 consultation was concluded, the Corps requested that applicants submit information allowing the Corps to verify their activities were covered by the new programmatic consultation issued in 2016, and if so, applicants were issued updated authorizations.

The four Corps districts have also taken some steps to address difficulties applicants have experienced with the time it takes to authorize shellfish aquaculture activities. For example, in 2017, the Seattle District developed an approach to expedite its application process for the Nationwide Permit 48 issued in March 2017. Specifically, for those applicants who had previously been authorized under Nationwide Permit 48 in 2012 and who did not anticipate changes to their activities for the 2017 permitting cycle, district officials said they could base their review on previously submitted documentation from the applicants, allowing them to more quickly reauthorize those activities. The five permit applicants we interviewed from the Seattle District said that the Corps' expedited process initiated in March 2017 improved the timeliness of receiving their authorizations. For instance, one applicant who waited about 8 months to receive his authorization in 2012 said the Corps issued his most recent authorization in 2017 in 2 months.

In addition, Corps officials from across the four districts said they have taken steps to reduce the time needed to review applications through efforts to more efficiently conduct reviews under the Endangered Species Act. For example:

- Corps officials from the Baltimore and Norfolk Corps districts worked with the National Marine Fisheries Service in 2017 to develop a regional programmatic consultation to help streamline Endangered Species Act assessments of the potential impact that shellfish aquaculture activities may have on listed species or their designated critical habitats. Corps officials from the Baltimore District said the review process, developed in association with the programmatic consultation, decreased their review time from over 30 days to 1 to 2 days, which in turn has helped reduce the Corps' time frames for issuing authorizations.
- In 2015, New Orleans District officials said they implemented a standardized process for evaluating applications for Endangered Species Act compliance. The district developed a standardized form, called the Standard Local Operating Procedure for Endangered Species in Louisiana, which district officials said helps to facilitate evaluations by allowing program managers to quickly assess whether or not an application requires further review and consultation and reducing the overall time to process shellfish aquaculture-related applications.
- Corps officials from the Seattle District worked with the National Marine Fisheries Service and U.S. Fish and Wildlife Service to

develop a programmatic consultation, issued in 2016. The programmatic consultation identified methods for carrying out shellfish aquaculture activities that would avoid adverse environmental effects on listed species and their critical habitats, and reduce water quality impacts. Corps officials from the Seattle District said that this programmatic consultation has resulted in a more efficient review process for applicants seeking authorization under Nationwide Permit 48 by reducing the amount of time needed to assess whether an applicant's proposed activities may have the potential to affect listed species or their critical habitats.

To further improve the application process, Corps headquarters officials said that they are initiating training in fiscal year 2019 through online modules that will cover various aspects of permitting such as clarifying the necessary elements needed from entities in submitting an application. Also, in October 2018, Corps headquarters launched a community of practice on shellfish aquaculture permitting, which officials said will allow project managers and others with an interest in shellfish aquaculture to share lessons learned and to collaborate on relevant issues in the future. A Corp official said the Corps plans to hold quarterly meetings for the shellfish aquaculture permitting community of practice going forward.

Agency Comments

We provided a draft of this report to the Department of Defense for review and comment. The department provided technical comments, which we incorporated as appropriate.

We are sending copies of this report to the appropriate congressional committees, the Secretary of the Army, the Chief of Engineers and Commanding General of the U.S. Army Corps of Engineers, and other interested parties. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-3841 or FennellA@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix II.

A handwritten signature in black ink that reads "Anne-Marie Fennell". The signature is written in a cursive style with a large, looping initial "A" and a horizontal line underlining the entire name.

Anne-Marie Fennell
Director, Natural Resources and Environment

Appendix I: Objectives, Scope, and Methodology

This report describes, for 2012 through 2017, (1) the number and outcomes of the applications the Corps received for shellfish aquaculture activities and the types of permits the Corps used to authorize such activities, and (2) the experiences of permit applicants in selected districts in seeking Corps authorization for their shellfish aquaculture activities.

To conduct our work, we reviewed relevant federal laws, regulations, and Corps documents on permitting, and interviewed officials from Corps headquarters.¹ We selected a non-generalizable sample of four Corps districts—Baltimore, New Orleans, Norfolk, and Seattle—for a closer examination of the nature of shellfish aquaculture activities and the types of permits used by districts to authorize such activity. We selected these districts based on several factors:

- **Geographic region.** We selected at least one district from each of the Pacific, Atlantic, and Gulf coasts to cover any differences in shellfish activity by geographic location.
- **Commercial value of shellfish.** The states in which the four districts reside—Washington (Seattle District); Maryland (Baltimore District); Virginia (Norfolk District); and Louisiana (New Orleans District)—account for more than 60 percent of the commercial shellfish sales in the United States as of 2013, the most recent data available as of December 2018.²
- **Type and level of permitting activity authorized by the Corps.** We also chose districts to represent different types of general and

¹At the time of our review, federal litigation related to the administration of shellfish permitting in the Corps' Seattle District was underway and therefore we scoped our review to minimize overlap with issues pending in litigation. See, *Coalition to Protect Puget Sound Habitat v. U.S. Army Corps of Engineers*, Civ. No. 16-00950 (W.D. Wash., filed June 22, 2016); *Center for Food Safety v. Corps*, Civ. No. 17-01209 (W.D. Wash., filed Aug. 10, 2017); and *Swinomish Indian Tribal Community v. Corps*, Civ. No 18-00598 (W.D. Wash., filed April 24, 2018).

²U.S. Department of Agriculture, National Agricultural Statistics Service; *2012 Census of Agriculture, Census of Aquaculture (2013)*, Vol. 3, Special Studies, Part 2, Sept. 2014; AC-12-SS-2.

individual permits the Corps districts used to authorize shellfish aquaculture as well as the level of permitting activity. The four districts received more than half of the shellfish aquaculture applications authorized by the Corps during 2012 through 2017.

We conducted site visits from July 2017 to March 2018 to each of the four selected districts to observe aquaculture activities and learn about the types of permits the districts use to authorize shellfish aquaculture activities. We also interviewed stakeholders with a regulatory role in shellfish aquaculture and non-governmental organizations with an advocacy role, as follows:

- **Federal Officials.** We interviewed officials from three regional offices of the National Marine Fisheries Service and U.S. Fish and Wildlife Service to understand how they work with the four Corps districts on shellfish aquaculture permitting. We gained their perspectives on how they coordinate with the Corps to meet various legal requirements, such as those under the National Environmental Policy Act, Endangered Species Act, and Magnuson-Stevens Fishery Conservation and Management Act.
- **State Officials.** We interviewed state agency officials involved in permitting at the state level to learn about state permitting requirements and coordination undertaken with the Corps districts on various aspects of shellfish aquaculture permitting. Specifically, we interviewed officials from the Maryland Department of Natural Resources, Washington Department of Ecology, Virginia Marine Resources Commission, Louisiana Department of Natural Resources, and Louisiana Department of Wildlife and Fisheries.
- **Non-governmental Officials.** We also interviewed non-governmental organizations with an advocacy role related to shellfish aquaculture or conservation to gain their perspectives on the Corps' permitting process. We interviewed officials from the Chesapeake Bay Foundation, The Nature Conservancy, Pacific Coast Shellfish Growers Association, East Coast Shellfish Growers Association, Oyster South, Center for Food Safety, the Coalition to Protect Puget Sound Habitat, the Coalition to Restore Coastal Louisiana, and the Coastal Protection and Restoration Authority of Louisiana. We selected these organizations because each had interacted with one or more of the four Corps districts we reviewed on shellfish aquaculture issues during the period of our review.

The information we obtained from officials from the four districts and stakeholders is not generalizable to other Corps districts or stakeholders

but illustrates the variation in Corps' shellfish aquaculture permitting at the district-level.

To examine the number, outcomes, and types of permits the Corps used to authorize shellfish aquaculture activity, we obtained and analyzed data from the Corps' permitting database, the Operations and Maintenance Business Information Link Regulatory Module 2. Specifically, we analyzed nationwide data on shellfish aquaculture applications submitted to Corps district offices with a decision date from January 1, 2012, through October 26, 2017, which were the most recent data available at the time of our review.³ The information we analyzed from the database included applications for various types of shellfish aquaculture activities for which entities sought Corps authorization, including commercial operations, as well as shellfish aquaculture and oyster reef restoration activities.⁴ For all Corps districts, we analyzed the number of applications received, authorized, withdrawn, or denied, and under which type of permit an application was submitted to the Corps.⁵ We took steps to determine the reliability of the Corps' data, including comparing the data to the

³The decision date is the date the Corps district makes a decision to authorize, withdraw, or deny an entity's application for authorization of shellfish aquaculture activities.

⁴The Corps' permitting database contains information on shellfish activities for which entities sought authorization from relevant Corps districts. These activities included commercial shellfish operations, activities to create new or restore former oyster reefs, and shellfish aquaculture for research. For the purposes of this report, we refer to all shellfish-related activities included in the Corps' permitting database as shellfish aquaculture activities. Not all shellfish aquaculture activity requires Corps authorization, however, and the Corps does not collect information on shellfish activities where Corps authorization was not sought. Because such activities are not included in the Corps' permitting database, they are not included in our analysis on shellfish activity.

⁵Entities seeking authorization may include individuals, businesses, organizations (such as non-profit organizations undertaking restoration activities), or other groups, according to Corps officials. Not all shellfish aquaculture activity requires entities to notify and submit an application for Corps authorization, as discussed in this report. Because the Corps does not collect data on shellfish aquaculture activities in which entities do not seek Corps authorization, such activities were not part of our analysis. We also obtained nationwide data on time frames for issuing authorizations from the Corps' permitting database, which the agency uses in part for managing its workload. However, we determined that an analysis of the time frames for permit issuance across the districts over the period of our review would not provide meaningful information for various reasons. For instance, authorizing shellfish aquaculture activities is one of many permitting responsibilities that the Corps balances and prioritizes. In addition, general permits are cyclical, covering up to 5-year periods, but different types of general permits may have differing start and end dates, which can impact the Corps' workload at different times. As a result, we did not include an analysis of time frames in our review given the variety of factors that can impact time frames.

administrative files for three to five randomly selected applications from the four districts we reviewed. We also reviewed agency guidance on data entry and interviewed agency officials knowledgeable about the Corps' permitting data, including officials from the four districts and headquarters. Based on these steps, we found the data to be sufficiently reliable to provide nationwide and district-level summary information on applications, authorizations, and the types of permits the Corps used during the period of our review.

To determine the experiences of permit applicants in selected districts in seeking Corps' authorization for their shellfish aquaculture activities, we randomly selected 15 applications submitted by different applicants during the time period of our review to the four Corps districts in our review.⁶ We reviewed the materials included in the Corps' administrative files to determine the nature of activities being proposed, documentation of any interactions between the Corps' and the applicants throughout the review process, and the time frames for the review, among other things. We conducted semi-structured interviews with each of the applicants to gain their experience during the application process, including their perspectives on the steps involved in submitting an application, the time frames for receiving authorization, their understanding of permit terms and conditions, and the nature of any interactions with the Corps, among other things. We also conducted semi-structured interviews with the Corps managers responsible for reviewing these applications to obtain their perspectives about their review process for the selected applications. We then analyzed and categorized the interview responses based on common themes that we identified across the interviews. The information we obtained from the permit applicants and Corps officials we interviewed is not generalizable to other applicants, but illustrates the types of experiences permit applicants in the four districts have had in seeking authorization for their shellfish aquaculture activities.

In addition, we also interviewed Corps officials in the four districts and headquarters and reviewed related documentation to identify any steps the Corps has taken to address difficulties raised by the permit applicants.

⁶We initially randomly selected five applications from each of the four districts for review. However, due to the limited number of shellfish-related applications submitted in the New Orleans and Norfolk districts, we reduced the sample size to three applications for these two districts. In addition, although we randomly selected five applications from the Baltimore Corps District, we were unable to reach one of the selected applicants for an interview. We therefore reviewed a total of four applications from the Baltimore District.

We then requested and reviewed supporting documentation when officials identified examples of steps they have taken to help improve the application process.

We conducted this performance audit from June 2017 to January 2019 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: GAO Contact and Staff Acknowledgments

GAO Contact

Anne-Marie Fennell, (202) 512-3841 or FennellA@gao.gov

Staff Acknowledgments

In addition to the contact named above, Alyssa M. Hundrup (Assistant Director), Ginny Vanderlinde (Analyst in Charge), Justin Fisher, Melissa Greenaway, Rich Johnson, Ying Long, Danny Royer, Sheryl Stein, and Jina Yu made key contributions to this report. Mark Braza, Juan Garay, and Gina Hoover also made contributions to this report.

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