

Five-Year Status Report: Management of Conflicts Associated with Double-crested Cormorants

U.S. Fish and Wildlife Service

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Executive Summary

This report reviews five years of efforts to address conflicts associated with Double-crested Cormorants (cormorants) in the contiguous United States. It assesses population status, authorized and reported lethal take, and conflict trends. Population information from 2024 surveys indicates that most populations of cormorants have remained relatively stable, although the Western Population has declined. Potential Take Limits (PTLs)¹ were updated using the 2024 population information; three populations had lower revised PTLs, most notably the Western Population. The revised PTLs will be implemented beginning January 1, 2027.

During the five-year review period, authorized take remained below current PTLs, and reported take was substantially lower than authorized take. This suggests that operational, rather than permitting, constraints may limit implementation and highlights the need to identify and address factors limiting implementation. Cormorant-related conflicts are generally localized, but significant management challenges have evolved in the Western Population, particularly in the Columbia River Basin. In 2026, requests for lethal take exceeded the current PTL and, if demand remains at a similar level, would also exceed the revised 2027 PTL, raising concerns about the flexibility of the current management framework to address ongoing and emerging conflicts.

Recommendations:

- Identify and evaluate potential PTL modifications to provide flexibility for large-scale, geographically concentrated, or multi-year conflicts.
- Reconsider the Western Population 50% limit based on population status, monitoring, historical take, and other relevant information.
- Improve coordination among permit holders and partners addressing related conflicts.
- Strengthen information and reporting systems to improve access to take information and support permitting decisions.
- Enhance partnerships with U.S. Department of Agriculture-Animal and Plant Health Inspection Service: Wildlife Services (USDA-WS) on technical assistance, management recommendations, and research.
- Continue population monitoring and periodic PTL evaluations to support assessments and address information gaps.

Overall, the current framework remains appropriate for most populations, but the Western Population warrants additional evaluation given increasing management demand and the potential limitations of the current PTL for concentrated, multi-year conflicts.

1 Introduction

1.1 Background

In 2020, the U.S. Fish and Wildlife Service (Service), in cooperation with USDA-WS, completed a Final Environmental Impact Statement (FEIS; Service 2020a) that evaluated alternative

¹ PTL means Potential Take Limit. The term “Prescribed Take Level” has also been used by some practitioners to refer to PTLs. For purposes of this report, PTL refers to a population-based threshold used to evaluate and inform decisions about authorized take. The Service considers the applicable PTL together with population information, requested and authorized take, and other relevant information when evaluating permit requests.

approaches for authorizing the take of cormorants to alleviate damage and conflicts in the contiguous United States. The FEIS informs the Service's regulatory approach for addressing cormorant-related conflicts while considering effects on cormorant populations consistent with the Migratory Bird Treaty Act. In accordance with the FEIS, the Service evaluates cormorants within four populations²: Atlantic, Florida, Interior, and Western. These populations were initially delineated by subspecific taxonomy: *Nannopterum auritum albociliatum* (Pacific population), *N. a. auritum*, and *N. a. floridanum* (Florida population). The subspecies *N. a. auritum* was subsequently divided into Atlantic and Interior Populations that conform to North American Flyway boundaries (Atlantic versus Mississippi plus Central Flyways), based on their relatively distinct breeding and wintering areas identified through telemetry and band-recovery studies (Service 2020a).

The Service authorizes lethal take of cormorants through several permit mechanisms, including Depredation permits (50 CFR § 21.100), Special Double-crested Cormorant permits (50 CFR § 21.123), Scientific Collecting permits (50 CFR § 21.73), and Special Purpose permits (50 CFR § 21.95). This report focuses on Depredation permits and Special Double-crested Cormorant permits, which are the primary mechanisms used to authorize take to address cormorant-related conflicts. Depredation permits may be issued to authorize the take of migratory birds to reduce damage or loss, including agricultural loss, property damage, threats to human health and safety, and threats to recovery of protected fish and wildlife. The Special Double-crested Cormorant permit, established following the 2020 FEIS and available since 2021, is issued to State or Tribal fish and wildlife agencies to authorize take to address certain impacts from cormorants on lands or in waters managed by those agencies and within those agencies' jurisdiction. Together, these permit regulations support the Service's population-based approach to addressing cormorant conflicts.

As part of the selected management approach, the FEIS committed the Service to periodically evaluate cormorant populations, authorized and reported take, and the effectiveness and continued need for management. The FEIS also committed the Service to produce a public report every five years, and as necessary, to include updated analyses from population-monitoring efforts and other status information. The report is intended to promote transparency in decision making and facilitate evaluation of the effectiveness of the conflict-management tool.

1.2 Purpose and Scope of the Report

This report fulfills the Service's commitment to conduct a five-year review of cormorant management under the framework established by the 2020 FEIS. The report evaluates

² **Geographic distribution of the four cormorant populations:**

Atlantic Population (16 states): Connecticut, Delaware, Georgia, Maryland, Maine, Massachusetts, North Carolina, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, South Carolina, Vermont, Virginia, and West Virginia.

Florida Population (1 state): Florida.

Interior Population (24 states): Alabama, Arkansas, Colorado, Iowa, Illinois, Indiana, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Missouri, Mississippi, Montana, New Mexico, North Dakota, Nebraska, Ohio, Oklahoma, South Dakota, Tennessee, Texas, Wisconsin, and Wyoming.

Western Population (7 states): Arizona, California, Idaho, Nevada, Oregon, Utah, and Washington. Alaska and Hawaii: Outside the geographic scope of this review.

information available for the review period, January 1, 2021, to December 31, 2025, to assess population status, management activities, the state of cormorant-related conflicts, and the effectiveness and continued need for the current management approach.

Consistent with the FEIS, this report includes, but is not limited to:

1. Updated information on cormorant population status and trends;
2. Reported lethal take of cormorants nationally and by cormorant population;
3. Updated PTL analyses based on new or more current population information;
4. An assessment of the state of cormorant-related conflicts and the need for continued management, informed by requests for depredation permits, including individual and programmatic requests by participating States and Tribes; and
5. A conflict-management decision and justification for continuing the current management approach or proposing a new management approach, if appropriate and needed.

Together, these analyses provide a basis for evaluating whether the current conflict-management framework remains appropriate and whether changes to the approach are warranted. The report also identifies significant or emerging management issues and recommendations for improving implementation of the current framework.

2 Methods

2.1 Surveys

We estimated the abundance of the four cormorant populations (Atlantic, Florida, Interior, and Western) using active nest counts obtained in partnership with state and provincial agencies. The Service, Canadian Wildlife Service (CWS), and partners developed survey designs in coordination with the Flyways and tailored them to regional monitoring objectives. Surveys conducted in 2024 included censuses of known active colonies and probability-based sampling of historic colonies. The U.S. portion of the Atlantic Population and the Great Lakes states and provinces incorporated cormorant nest counts into broader surveys of other waterbird species. Where 2024 surveys were not available, we used historical nest counts. Additional methodological details are provided in Seamans et al. (in prep.).

Atlantic Population

1. **U.S. portion** – State agencies in the Atlantic Flyway conducted a census of known active nests in 2024.
2. **Maritimes** (Labrador, New Brunswick, Newfoundland, Nova Scotia, Prince Edward Island) – Provincial agencies and/or CWS provided nest counts collected before 2024.

Interior Population

1. **Prairie Provinces** (Alberta, Manitoba, Saskatchewan) – Provincial agencies and CWS provided nest counts collected before 2024.
2. **Quebec and Canadian Great Lakes** – CWS and provincial agencies conducted a census of known active nests in 2024.
3. **U.S. Great Lakes** – State agencies counted nests at colonies selected through a sampling design developed to support monitoring of multiple bird species.

4. **U.S. Interior outside the Great Lakes** – State agencies used a stratified random sampling design to select historic colonies for nest counts, with colonies grouped by their most recent nest counts.

Western Population

State agencies conducted nest counts at historic colonies selected through a stratified random sampling design based on the colonies' most recent nest counts and collected nest-count data contributed by Federal, Tribal, county, and nongovernmental partners.

Florida Population

State agencies provided nest counts collected before 2024. Because older nest counts may not reflect current population size, we applied a 25% coefficient of variation to the Florida, Prairie Provinces, and Maritimes estimates to account for additional uncertainty. This coefficient of variation exceeds the value used in the 2020 FEIS and reflects the increasing age of the available data.

2.2 Population Estimates

We estimated population size from the number of nests detected in each population. For the Florida and Western Populations, we used the population-level nest count directly. For the Atlantic and Interior Populations, we summed the estimates from individual survey segments. For census counts, we used the total number of nests counted. For randomly stratified segments, we estimated the number of nests within each stratum and summed those estimates to obtain the population-level nest estimate (Krebs 1998).

We converted nest estimates to total population size by assuming that each nest represented two breeding adults and that one- and two-year-old cormorants did not breed. We used two approaches to estimate the number of younger non-breeding birds. The first used flock age composition from the Great Lakes (Dorr et al. 2026) to estimate the proportion of nonbreeding, presumably one- and two-year-old birds. The second used population modeling to estimate the proportion of one- and two-year-old birds needed to support the number of adults estimated from nest counts under a stable population assumption. These approaches resulted in estimates of 2.320 and 2.567 total birds per nest, respectively. We used this range of birds per nest to estimate total population size and its uncertainty through simulation.

2.3 Potential Take Limits (PTLs)

Methods for calculating PTLs follow those established in the 2020 FEIS (Service 2020a). The calculation uses three inputs: minimum population size, maximum population growth rate, and a management factor. We estimated minimum population size from the 2024 cormorant surveys and derived maximum population growth rate from annual nest counts collected in the Great Lakes from 1979–2009, a period of time when cormorants were undergoing rapid population expansion and were well-monitored.

The management factor represents the desired population response to take and ranges from 0 to 2.0 (Runge et al. 2009). In general, a value of 1.0 represents the maximum annual take expected to maintain population sizes at or above levels where they can readily recover. Lower values provide more conservative management and result in larger populations than a management

factor of 1.0. Values greater than 1.0 allow for greater take but are typically used only for over-abundant species. Management factor values are unchanged from the 2020 FEIS (Service 2020a, Appendix E): 1.0 for the Atlantic, Interior, and Western Populations and 0.5 for the Florida Population. For the Atlantic, Florida, and Interior Populations, the PTL corresponds directly to the level produced by the PTL calculation. For the Western Population, the 2020 FEIS used a management factor of 1.0. In response to concerns raised during public comment, the 2020 Record of Decision (ROD; Service 2020b) reduced allowable annual take to one-half of the FEIS PTL calculation. For purposes of this report, the term “Western Population PTL” refers to the reduced allowable annual take limit established by the ROD (i.e., 50% of the Western Population PTL calculation).

We estimated PTLs and their associated uncertainty using a simulation approach that accounts for uncertainty in both population size and population growth rate. Following the methods in the 2020 FEIS (USFWS 2020a, Appendix E), we used the lower 60% confidence interval of the simulated estimates to establish the annual PTL for each population. The confidence interval reflects uncertainty in the PTL resulting from uncertainty in population size and growth rate.

3 Results

3.1 Population Abundance and PTL Estimates

Revised population abundance estimates and PTLs are presented in Table 1, along with the corresponding estimates evaluated in the 2020 FEIS. Comparisons should be interpreted cautiously because the underlying nest-count data were collected using different survey designs and time periods among populations, except for the Western Population, where consistent survey methods were used across survey periods.

The 2024 median population estimates for the Interior and Florida Populations were similar to the median population estimates reported in the 2020 FEIS. The 2024 Western Population estimate was within the range of estimates evaluated in the 2020 FEIS but was near the lower end of that range. The 2024 Atlantic Population estimate was slightly below the range of estimates reported in the 2020 FEIS.

The revised PTLs reflect differences between the 2020 and 2024 population estimates. The Interior Population had a slightly higher revised PTL than the value established in the 2020 FEIS, whereas revised PTLs for the Atlantic, Florida, and Western Populations were lower. The Western Population had the largest proportional reduction in both estimated population size and PTL. The PTL value for the Florida Population decreased slightly from the 2020 FEIS because additional uncertainty was added to the historic point estimate of active nests since no new surveys were conducted to update the estimate.

The revised PTLs presented in Table 1 are based on the 2024 population information and will be implemented beginning January 1, 2027. Until that time, the current PTLs established through the 2020 FEIS and ROD remain in effect.

Table 1. Comparison of cormorant population (Pop.) abundance estimates and PTLs (Current and Revised). Current population estimates and PTLs are based on the 2020 FEIS and ROD; revised estimates and PTLs are based on 2024 population data. Population estimates are median (Med.) estimates.

Population	Management Factor	2020 Med. Pop. Est.	Current PTL (2020 FEIS and ROD)	2024 Med. Pop. Est.	Revised PTL (2024 data)
Atlantic	1.0	273,953	37,019	245,089	33,320
Florida	0.5	19,550	1,314	19,573	1,199
Interior	1.0	585,758	78,632	606,432	82,536
Western	1.0	72,119	4,539*	50,473	3,267*

* The 2020 FEIS calculated an annual take limit of 9,077 birds for the Western Population based on a management factor of 1.0. The 2020 ROD subsequently limited allowable annual take to 4,539 birds, or one-half of the amount calculated in the FEIS, in response to concerns raised during public comment. The revised Western Population PTL of 3,267 birds reflects application of the 2020 ROD's 50% limitation on allowable take to the updated 2024 population information, using the 1.0 management factor specified in the FEIS.

3.2 Authorized and Reported Take, 2021–2025

Authorized and reported lethal take of cormorants from all permit types from January 1, 2021 to December 31, 2025, appears in Table 2 for all populations and in Table 3 and Figure 1 by population.³ Because we establish PTLs independently for each population, we evaluate authorized and reported take against the applicable population-specific PTL rather than combining take across populations. We present national totals for descriptive purposes only. Reported take includes both adult take and nest take, using a conversion factor of 1 nest = 0.63 adults based on survival estimates across life stages (Service 2020a, Appendix E).

Table 2. National summary of authorized and reported cormorant lethal take (includes nest take), 2021–2025. These national totals are provided for illustrative purposes only; PTLs are established and applied separately to each population.

Year	Combined Population PTLs*	Authorized Take	Authorized Take as % of Combined PTLs	Reported Take	Reported Take as % of Authorized	Reported Take as % of Combined PTLs
2021	121,504	77,265	63.6%	7,448	9.6%	6.1%
2022	121,504	72,346	59.5%	11,466	15.8%	9.40%
2023	121,504	79,219	65.2%	49,491	62.5%	40.7%
2024	121,504	85,291	70.2%	38,899	45.6%	32.0%
2025	121,504	90,163	74.2%	44,612	49.5%	36.7%

* Combined population PTLs are presented for descriptive purposes only and do not represent a national take limit. PTLs are established and applied separately by population.

Across populations, average annual authorized take remained below the applicable current population-specific PTL during 2021–2025. Average authorized take ranged from approximately 16% of the current PTL in the Florida Population to 75% in the Interior Population. Average

³ **2026 Data Note.** The Emergency Assistance for Livestock, Honeybees, and Farm-Raised Fish Program (ELAP-28; July 8, 2026), administered by USDA's Farm Service Agency, expanded to include losses affecting farm-raised fish. ELAP compensation currently requires a Federal migratory bird depredation permit as documentation. The data for this report were collected prior to this expansion and does not capture potential increases in depredation permit demand or associated changes in the proportion of population-specific PTLs authorized.

reported take was substantially lower than authorized take in all populations and represented a smaller proportion of the applicable current PTL (Table 3; Figure 1).

The difference between authorized and reported take indicates that the amount of take authorized was generally not the limiting factor in the number of cormorants ultimately taken. Anecdotal information suggests operational factors may have limited implementation of management activities and, consequently, the amount of take occurring. Section 4.3 discusses these operational factors and their implications for evaluating cormorant conflicts.

Table 3. Average (Avg.) annual authorized (Auth.) and reported cormorant lethal take (includes nest take) by population, calendar year 2021–2025, relative to the population-specific PTL.

Population	Current PTL	Avg. Auth. Take (2021–2025)	Auth. Take as % of Current PTL	Avg. Reported Take	Avg. Reported Take as % of Current PTL
Atlantic	37,019	18,515	50.0%	5,671	15.3%
Florida	1,314	209	15.9%	73	5.6%
Interior	78,632	58,788	74.8%	23,747	30.2%
Western	4,539	2,415	53.2%	891	19.6%

Overall, updated 2024 population information resulted in lower revised PTLs for three of the four cormorant populations, with the largest reduction occurring for the Western Population. From 2021–2025, average authorized take remained below current population-specific PTLs for all populations, while reported take was substantially lower than authorized take.

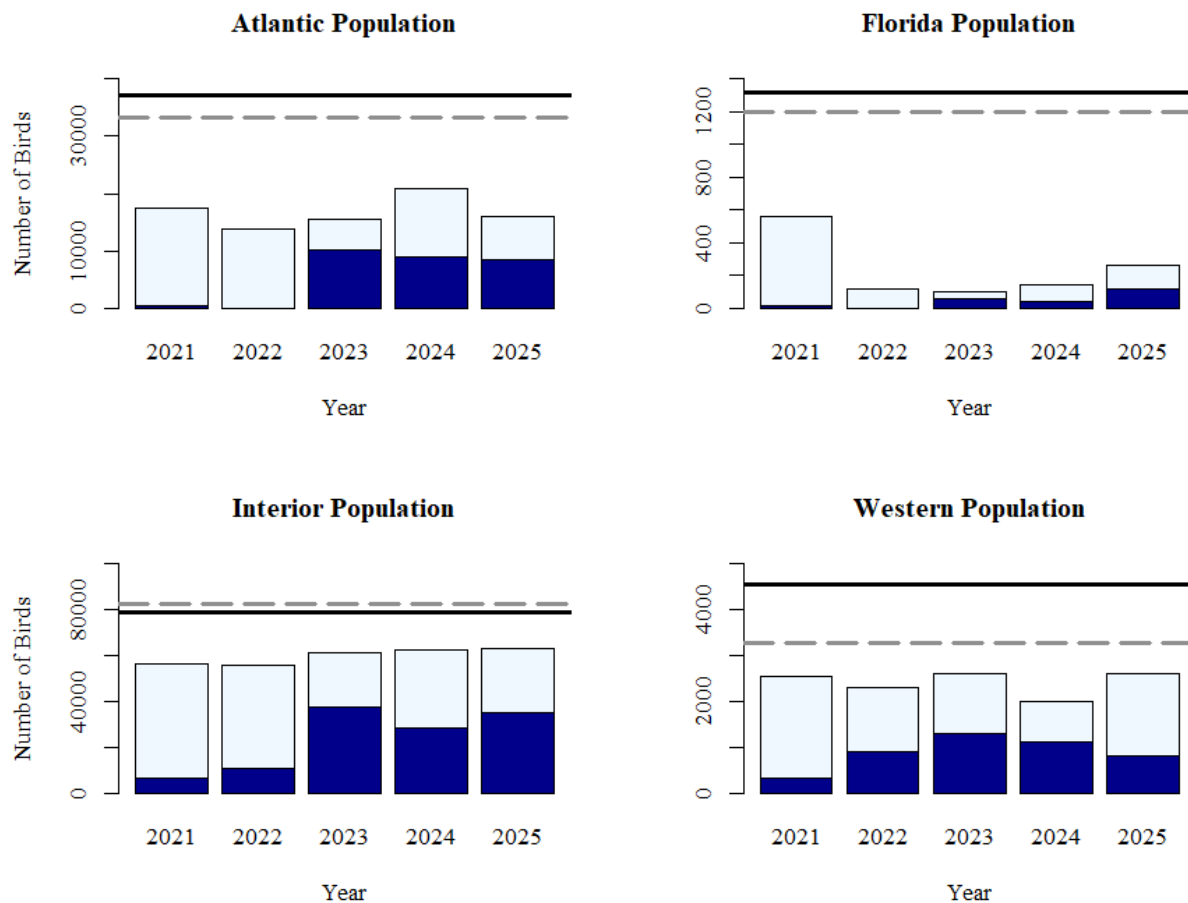


Figure 1. Average annual authorized and reported lethal take of cormorants relative to the current population-specific PTL for the Atlantic, Florida, Interior, and Western Populations, 2021–2025. The full bars represent authorized take, while the dark portion represents reported take (including nest take) within the authorized amount. The solid black line represents the Current PTL established through the 2020 FEIS and ROD, and dotted gray line represents the 2024 Revised PTL.

4 Analysis and Discussion

4.1 Population Status and Current Management

The updated population information does not indicate a consistent population-level change across all four cormorant populations. The Interior and Florida population estimates were generally similar to the estimates evaluated in the 2020 FEIS, while the Atlantic estimate was somewhat lower and the Western estimate was near the lower end of the range previously evaluated. Because the underlying surveys differed in design and timing, differences between the 2020 FEIS and 2024 estimates should not be interpreted as definitive population trends. Rather, the updated estimates provide the current population information used to evaluate biological limits for take.

The revised PTLs generally reflect differences in 2024 population abundance. The Interior Population has a slightly higher revised PTL than the value established in the 2020 FEIS, while the Atlantic, Florida, and Western Populations have lower revised PTLs. The reduction in the

revised Western PTL is particularly important in the context of increasing management demand, particularly in the Columbia River Basin, and the resulting potential for management requests to approach or exceed the amount of take available under the population-based framework. For the Western Population, the applicable PTL incorporates the ROD-based allowable take limit described in Section 2.3.

Historical take data provide additional context for evaluating the effectiveness of current management. From 2021–2025, average authorized take remained below the current population-specific PTLs for all four populations, and reported take was substantially lower than authorized take. Reported take may be lower than authorized take because of factors affecting implementation, including funding, staffing, access to management sites, timing, coordination requirements, and the ability to respond to emerging conflicts.

Taken together, the updated population information and historical take data do not indicate that management during the review period resulted in take exceeding the current population-specific limits. However, historical take does not necessarily predict future management demand. Changes in the location, severity, or nature of conflicts can result in substantially greater requests for take, while changes in population abundance can reduce the amount of take available under a population-based framework. These considerations are particularly relevant to the Western Population and are discussed further below and in Sections 4.2 and 5.

4.2 State of Cormorant-Related Conflicts

Requests for depredation permits provide an important indicator of cormorant-related management demand and are specifically identified in the 2020 FEIS as a basis for evaluating the state of the conflict and the need for continued management. Although authorized and reported take provide information on the amount of lethal take associated with management, permit information provides additional context on the frequency and distribution of management needs. During the 2021–2025 review period, the Service authorized lethal take through Depredation permits, Special Double-crested Cormorant permits, and other permit types, including Scientific Collecting and Special Purpose permits. Table 4 summarizes the number of permits issued during the review period by cormorant population and permit type.

The Service issued between 208 and 261 permits annually during 2021–2025. The Interior Population accounted for the largest number of permits, while the Atlantic, Western, and Florida Populations accounted for substantially fewer. Permit numbers provide context for management demand but are not a direct measure of conflict severity because individual permits may authorize different amounts of take and may cover different geographic areas, applicants, and management circumstances. The Service therefore considers permit numbers together with authorized and reported take and information from partners, industry, and the public when evaluating cormorant-related conflicts. The population-specific information below provides additional context for the nature and extent of management demand and the nature of cormorant-related conflicts during the review period.

Table 4. Number of cormorant permits issued by population, year, and permit type, 2021–2025. ‘Depredation’ includes all Depredation permits, including airport and USDA-WS permits. ‘Special DCCO’ includes only Special Double-crested Cormorant permits issued to States and Tribes. ‘Other’ includes other permits including Scientific Collecting and Special Purpose permits.

Permit Type by Population	Year					Total
	2021	2022	2023	2024	2025	
Atlantic	24	26	34	29	45	158
Depredation	22	23	30	25	41	141
Special DCCO	2	2	3	3	3	13
Other	0	1	1	1	1	4
Florida	9	4	3	4	9	29
Depredation	9	4	3	4	8	28
Other	0	0	0	0	1	1
Interior	164	191	180	166	182	883
Depredation	160	183	176	162	177	858
Special DCCO	3	3	4	3	4	17
Other	1	5	0	1	1	8
Western	11	25	25	21	25	107
Depredation	11	23	25	21	22	102
Special DCCO	0	0	0	0	0	0
Other	0	2	0	0	3	5
Total Permits Issued	208	246	242	220	261	1177

Atlantic Population

Permit demand in the Atlantic Population remained generally localized during the review period. Authorized and reported take remained below the population's current PTL, with average authorized take representing approximately 50% of the PTL and reported take approximately 15%.

These results suggest that the existing management framework generally provides sufficient capacity to address the level of management demand documented during the review period. Continued coordination with the Atlantic Flyway Council and State agencies will be important for identifying emerging or localized conflicts that may not be reflected in national take data.

Interior Population

The Interior Population accounted for substantially more permits than the other populations during the review period, reflecting continued management demand associated with fisheries, aquaculture, and other natural resources. Authorized and reported take remained below the population's current PTL, with average authorized take representing approximately 75% and reported take approximately 30% of the PTL, respectively.

The difference between authorized and reported take reflects, in part, practical constraints on implementation. State agencies have identified funding, staffing, site-specific flexibility, coordination requirements, and the ability to respond quickly to emerging conflicts as factors that

can limit implementation even when federal authorization is available. Take data alone may therefore not fully reflect ongoing conflict or management needs within the Interior population.

Florida Population

Management demand in the Florida Population remained relatively low during the review period. Authorized and reported take remained well below the population's current PTL, with average authorized take representing approximately 16% of the PTL and reported take approximately 6%.

Available information did not identify significant new or widespread conflicts during the review period and does not indicate that the current take limit has constrained management in the population. Continued monitoring and coordination with State and other partners will help identify changes in conflict levels or management needs.

Western Population

The Western Population presents the most significant emerging management issue identified during this review period. Cormorant-related conflicts have continued since publication of the 2020 FEIS, including conflicts associated with aquaculture, fisheries, infrastructure, and other natural resources. During the review period, authorized and reported take remained below the population's current PTL, with average authorized take representing approximately 53% of the current PTL and average reported take approximately 20%.

Although outside the five-year review period, information from 2026 provides important context for evaluating emerging management demand in the Western Population. Management demand increased substantially in 2026. Updated population information from 2024 resulted in a revised Western Population PTL of 3,267 birds, compared with the current applicable PTL of 4,539 birds. The revised PTL reflects both the updated population information and the limitation on allowable take established by the ROD, as described in Section 2.3. Additionally, in 2026, requests for lethal take increased substantially compared with historical levels, exceeding the current PTL. Because total requests exceeded the PTL, the Service could not authorize the full amount requested and reduced other permit authorizations to remain within the PTL. If the same level of requested take occurs in 2027, it would exceed the revised PTL.

Much of the increased management demand occurred in the Columbia River Basin, where cormorant predation on juvenile salmonids, including populations protected under the Endangered Species Act, and other conflicts have prompted consideration of management options. One potential approach involves actions at the largest breeding colony in the Western Population, which is currently located in an area where the colony presents safety concerns. Previous environmental analyses for cormorant management in the Columbia River Estuary evaluated a similar approach in which managers considered localized population reductions in the context of long-term population objectives (USACE 2015). A potential approach could require relatively high initial take followed by lower maintenance take, raising questions about whether the current PTL framework provides sufficient flexibility for large-scale, multi-year management while maintaining the population within biological limits.

4.3 Significant and Emerging Management Issues

The review indicates that the current cormorant management framework generally provides sufficient capacity to address the level of management demand historically documented for most populations. Operational constraints, rather than permit constraints, appear to limit management effectiveness in many situations. Historical reported take was substantially lower than authorized take across populations. Anecdotal information provided by permittees indicates that this difference likely reflects operational constraints rather than a lack of available take permits or an absence of conflict. Consequently, reported take should be considered together with information from State agencies, Tribes, resource managers, permit applicants, and other partners when assessing the extent and severity of conflicts.

Some conflicts involve broader, complex resource-management objectives that extend beyond what can be addressed through site-specific take. Cormorant management intersects with conservation of other species, fisheries, infrastructure, recreation, and other resource-management objectives. These situations may require managers to coordinate across jurisdictions, geographic areas, and management scales to address the broader conflict.

The Service should maintain sufficient flexibility to respond to emerging cormorant management needs while ensuring populations remain within appropriate biological limits. Management decisions should continue to consider population status, the biological and policy assumptions underlying the PTLs, the nature and severity of conflicts, and the effectiveness and feasibility of available management tools.

Overall, the information evaluated in this review supports continued population-specific management of cormorants under biologically based take limits, while also considering approaches to provide flexibility to address localized, emerging, or multi-year conflicts.

5 Conflict Management Decision and Recommendations

Based on the information evaluated in this five-year review, the Service has decided to continue implementing the population-specific conflict management framework established in the 2020 FEIS and ROD. Population estimates, revised PTL analyses, and reported take do not indicate that take during the review period exceeded the current population-specific limits or otherwise warrants replacing the current management approach. The current framework therefore remains appropriate for addressing the level of cormorant-related conflict documented during the review period.

The Service also identified the following recommendations to improve implementation of the current framework and address information, coordination, and management needs identified during the review.

Identify and Evaluate Potential PTL Modifications

The review identified circumstances in which demand for take may exceed the available population-specific PTL, particularly for large-scale, geographically concentrated, or multi-year conflicts. The Service should identify and evaluate potential modifications to the PTL framework or its application that could provide additional flexibility within population-based take limits.

Reconsider the Western Population 50% Limit

In 2020, the FEIS specified a management factor of 1.0 for the Western Population. In response to concerns raised during the public comment period, the 2020 ROD limited allowable annual take to one-half of the amount calculated under the FEIS. The revised 2027 Western Population PTL included in this report applies the same FEIS and ROD approach to the updated 2024 population information. This conservative approach was adopted in response to public comments; however, available monitoring information for the Western Population, historical patterns of reported take relative to authorized take, and other factors may mitigate risk sufficiently to warrant reconsideration of the 50% limit on allowable take. The Service could consider these factors, along with population status, management objectives, and other relevant information, to determine whether continued application of a 50% limit on allowable take is warranted. If the Service determines that a change to the approach established in the FEIS or ROD is warranted, the Service would complete the appropriate NEPA review and provide public involvement consistent with applicable requirements.

Improve Coordination Among Permit Holders and Partners

The Service will continue to improve coordination among permit holders, partners, industry, and other entities when multiple entities are addressing related conflicts within the same geographic area. This type of coordination is already occurring in some areas, where permit holders meet with the Service before submitting requests for take to identify geographic needs, discuss emerging conflicts, and ensure that combined requests remain within the applicable PTL. Applying this approach more broadly could help identify priorities and support more informed decisions about available take when multiple requests involve the same population-specific PTL.

A similar partnership-focused approach remains a priority in the Columbia River Basin, where multiple agencies and partners submit overlapping requests for take to address salmonid predation and infrastructure-related conflicts. Working with partners to share information, identify priorities, and align requests can help the Service evaluate competing needs and make more informed decisions when requests approach or exceed the population-specific PTL.

Strengthen Information and Reporting Systems

The Service should continue to improve the information and systems available to evaluate take demand and the effectiveness of conflict-management actions. The Service's Migratory Bird Program has begun implementing improvements that address this need by modernizing reporting, reducing administrative burden, and providing more timely access to requested, authorized, and reported take information. These improvements and other continued innovations strengthen the Service's ability to identify emerging management needs, track take relative to population-specific limits, anticipate competing requests, and support timely, well-informed permitting decisions.

Enhance Partnerships with USDA-WS

The Service should continue existing efforts to enhance its partnership with USDA-WS, including coordination on Form 37 use, technical assistance, management recommendations provided to permittees, and research addressing cormorant conflicts. Ongoing collaboration with USDA-WS provides important information from conflict sites and experience with management techniques. Continued collaboration on research, including efforts to evaluate the effectiveness

of nonlethal deterrence and cormorant fish consumption, will further strengthen the information available to the Service and partners when evaluating conflict and potential management approaches.

Continue Population Monitoring

The Service should continue population monitoring and periodic PTL evaluations using the best available information and work with States, Tribes, Flyway Councils, and other partners to identify emerging conflicts and assess whether PTLs remain appropriate. Future monitoring should focus on the information needed to evaluate population status and improve comparability over time.

An important information gap remains in the Canadian Prairie Provinces, where cormorant population data are outdated despite evidence of a substantial breeding population. Because many of these birds migrate into the United States during winter, this gap has implications for the Interior Population PTL and for understanding potential aquaculture impacts. Closer coordination with Canadian partners, including technical assistance to support feasible survey design, would strengthen shared monitoring and improve future PTL evaluations.

Overall Direction

The Service will continue to use the population-specific conflict management framework established in the 2020 FEIS and ROD while building on existing efforts to strengthen coordination, information, partnerships, and population monitoring that support its implementation. The recommendations in this review emphasize coordination of take requests, continued improvements of information and reporting systems, strengthened collaboration with USDA-WS, ongoing population monitoring, and evaluation of the Western Population 50% limit. Together, these actions will provide greater flexibility to respond to evolving cormorant conflicts while maintaining biologically based limits on take and ensuring future management decisions are informed by the best available information.

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