Pacific Flyway Council
Recommendations, Informational Notes, and Subcommittee Reports

A product of the August 2019 meetings of the:

Pacific Flyway Nongame Technical Committee
August 19 to 22, 2019
Clackamas, Oregon

and

Pacific Flyway Study Committee
August 19 to 21, 2019
Clackamas, Oregon

for the

Pacific Flyway Council
August 23, 2019
Clackamas, Oregon
Preface

The Migratory Bird Treaty Act implemented multiple international treaties addressing migratory bird conservation, and established federal authority over migratory birds. The U.S. Fish and Wildlife Service (Service), under the authority of the Secretary of the Interior, collaborates with the Pacific Flyway Council (Council) to develop regulations for migratory birds in the United States Pacific Flyway. Two technical committees advise the Council: the Study Committee (SC) and the Nongame Technical Committee (NTC), collectively referred to as Committees. The Committees are scientific fact finding bodies whereas the Council is an administrative and policy setting body.

The Service develops migratory game bird hunting regulations annually by establishing frameworks including outside dates, season lengths, bag limits, and hunting areas. The Council makes framework recommendations annually to the Service according to biological status, management objectives, and policy considerations. Members of the Council and the SC meet in late summer/early fall to share data, review the status of populations and actions outlined in management plans, and propose annual hunting frameworks. They meet again in late winter to develop cooperative management programs, and coordinate research and management for the protection and conservation of migratory game birds. The Council typically makes season framework recommendations to the Service in October.

The NTC also meets twice each year with the Council and SC. The NTC provides a consolidated forum for the Service and state fish and wildlife agencies to discuss, plan, and coordinate actions to address management, regulations, monitoring, and other issues related to nongame migratory birds. The NTC both responds to emerging issues originating with the Council or the Service and works proactively with conservation partners and with other states to identify and prioritize flyway-relevant issues that require attention.

Recommendations, informational notes, and subcommittee reports are prepared by the Committees, and forwarded to the Council for consideration or adoption. The Council may develop or modify Committee recommendations as necessary. The Council has a policy of considering management plans for adoption only after having received the management plan for review at least 45 days in advance. The Service assumes the Council support for continuation of the previous year’s frameworks if no recommendation is received.

Each recommendation and informational note identifies a contact person. The contact person drafts the recommendation or informational note (or facilitates its development) to represent the position of the Committee or the Council. The contact person is usually knowledgeable on the specific subject matter and serves as a contact for more information. If the recommendation or informational note comes from a subcommittee, that subcommittee is identified on the recommendation or note. The Chair of each subcommittee ensures the preparation of the subcommittee’s report and is identified on that report.
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Midcontinent Sandhill Crane
Mourning and White-Winged Dove
Pacific Brant
Pacific Coast and Central Valley Sandhill Crane
Pacific Coast Band-Tailed Pigeon
Pacific Coast Trumpeter Swan
Pacific/Rocky Mountain Western Canada Goose
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Rocky Mountain Trumpeter Swan
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Western Canada Goose
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Alberta Environment and Sustainable Resource Development
Jason Caswell, Alberta

Alaska Migratory Bird Co-management Council
Patty Brown-Schwalenberg
Recommendations
Recommendation 1 – Coot and Moorhen Season Framework

Recommendation
The Pacific Flyway Council recommends no change in season frameworks for coots and moorhens. The daily bag limit is 25, singularly or in the aggregate with a possession limit of three times the daily bag limit. Outside dates and season length are the same as the duck season framework.

Justification
The breeding population index for American coots in Washington, Oregon, and California combined was 391,080 birds (SE = 76,119, 95% CI = 241,888-540,273) in 2019 and 531,149 (SE = 103,514, 95% CI = 328,263-734,036) birds in 2018. Abundance appeared to decrease 26.4% between 2018 and 2019, but was statistically insignificant (Z-score = 1.09, P = 0.28). The mean abundance during the most recent 2 years (2018 and 2019) was 461,115 coots (SE = 90,855, 95% CI = 283,040-639,190).

Current regulations have resulted in modest harvest, while providing additional opportunity to hunters. The Pacific Flyway harvest estimates for 2019 are not yet available, but the 2018 estimate was approximately 18,400 coots.

Adoption
Pacific Flyway Study Committee
August 21, 2019

Brandon Reishus, Chair

Contact: Melanie Weaver

Adoption
Pacific Flyway Council
August 23, 2019

Kevin Blakely, Chair
Recommendation 2 – Dove Season Framework

Recommendation
The Pacific Flyway Council (Council) recommends the “Standard” regulatory alternative as prescribed by the mourning dove harvest strategy for doves in the Western Management Unit (WMU), which is no change from the previous season.

Council recommends a framework with outside dates between September 1 and January 15 with state-specific season lengths and bag limits as follows:

In Idaho, Nevada, Oregon, Utah, and Washington, the season length shall be not more than 60 days, which may be split between two periods. The daily bag limit is 15 mourning and white-winged doves in the aggregate.

In Arizona and California, the season length shall be not more than 60 days, which may be split between two periods, September 1–15 and November 1–January 15. In Arizona, during the first segment of the season, the daily bag limit is 15 mourning and white-winged doves in the aggregate; of which no more than 10 may be white-winged doves. During the remainder of the season, the daily bag limit is 15 mourning doves. In California, the daily bag limit is 15 mourning and white-winged doves in the aggregate; of which no more than 10 may be white-winged doves.

Justification
A new mourning dove harvest strategy was endorsed by the flyway councils and the Service Regulations Committee in 2013 for the Eastern, Central, and Western Management Units, with implementation beginning in 2014.

The harvest strategies for each Management Unit share a common assessment framework:
1) Discrete logistic model to estimate population parameters (intrinsic rate of growth, carrying capacity) and predict population abundance in the year subsequent to the data time series,
2) Critical abundance thresholds based on 30% and 50% of approximated maximum sustained yield,
3) 85% confidence that the predicted abundance exceeds the critical threshold that would trigger that regulatory change,
4) Standard, restrictive, and closed regulatory alternatives consistent in daily bag limit.

The predicted abundance of mourning doves and respective credible intervals (in millions) for 2018 in the WMU were 55.8 million. The predicted abundance results in a “Standard” regulatory alternative as prescribed by the harvest strategy.
Adoption
Pacific Flyway Study Committee
August 21, 2019

Brandon Reishus, Chair

Adoption
Pacific Flyway Council
August 23, 2019

Kevin Blakely, Chair
Recommendation 3 – Pacific Band-tailed Pigeon Season Framework

Recommendation
The Pacific Flyway Council (Council) recommends no change in the season framework for Pacific Coast band-tailed pigeons.

Council recommends a framework in California, Nevada, Oregon and Washington with outside dates between September 15, 2020 and January 1, 2021, a season length of nine days, a daily bag limit of two, and a possession limit of six. California may select a nine-day season in the North Zone and the South Zone. The North Zone includes Alpine, Butte, Del Norte, Glenn, Humboldt, Lassen, Mendocino, Modoc, Plumas, Shasta, Sierra, Siskiyou, Tehama, and Trinity counties. The season in the North Zone must close by October 3. The South Zone includes the remainder of the State.

Justification
The results of the 2019 Pacific Flyway Mineral Site Survey calls for a restrictive regulatory alternative for the 2020 hunting season as per the harvest strategy contained in the Pacific Coast Band-tailed Pigeon Management Plan. This regulatory alternative represents no change from last season.

Adoption
Pacific Flyway Study Committee
August 21, 2019

Brandon Reishus, Chair

Contact: Melanie Weaver

Adoption
Pacific Flyway Council
August 23, 2019

Kevin Blakely, Chair
Recommendation 4 – Interior Band-tailed Pigeon Season Framework

Recommendation
The Pacific Flyway Council (Council) recommends no change in the season framework for interior band-tailed pigeons.

Council recommends a framework in the Pacific Flyway portion of Arizona, Colorado, New Mexico, and Utah with outside dates between September 1 and November 30, season length of 14 days, and daily bag limit of 2. New Mexico may select hunting seasons in two zones: North and South Zones. The North Zone consists of the area north of a line following U.S. Highway 60 from the Arizona State line east to Interstate 25 at Socorro and south along Interstate 25 from Socorro to the Texas state line. The South Zone includes the remainder of the State. The South Zone season may not open until October 1.

Justification
Total harvest estimates, obtained from the Harvest Information Program (HIP), for the Interior population of band-tailed pigeons was 200 birds in 2018, which was down from 300 birds in 2017. State harvest surveys in Arizona and Colorado were discontinued when HIP was implemented; however, the harvest survey was maintained in Utah and estimated harvest was zero in 2017 and 2018.

There is still considerable uncertainty in harvest estimates from the federal harvest survey. All states are working to refine harvest surveys to improve harvest estimates, and each state now has a permit system required for anyone hunting band-tailed pigeons. Permits should provide a better sampling frame to increase the accuracy of harvest estimates.

Adoption
Pacific Flyway Study Committee
August 21, 2019

Brandon Reishus, Chair

Contact: Blair Stringham

Adoption
Pacific Flyway Council
August 23, 2019

Kevin Blakely, Chair
Recommendation 5 – Snipe Season Framework

Recommendation
The Pacific Flyway Council (Council) recommends no change in the season framework for snipe.

Council recommends a framework with outside dates between September 1 and February 28, season length of 107 days, daily bag limit of eight, and possession limit of 24. Season length may be split into two segments. Seasons may be selected by zones established for duck hunting.

Justification
The most recent Breeding Bird Survey (BBS) data available estimated the annual change in the snipe population in the Western Region was $-0.98\% \pm 0.44\%$ over the long-term (1966–2015), and $-1.04\% \pm 1.33\%$ over the short-term (2003–2015). The BBS Western Region data for snipe indicates a non-significant decline in the population; however, data (i.e., sample size, abundance, and precision) to detect population trends may be inadequate for this species.

Hunter participation and harvest estimates for snipe are obtained from the Migratory Bird Harvest Information Program. In 2016 and 2017, the snipe harvest estimate in the Pacific Flyway was 4,600 and 4,300, respectively. No harvest data for 2018 is available as of this recommendation.

Adoption
Pacific Flyway Study Committee
August 21, 2019

Brandon Reishus, Chair

Contact: Russell Woolstenhulme

Adoption
Pacific Flyway Council
August 23, 2019

Kevin Blakely, Chair
Recommendation 6 – Special Falconry Season Framework

**Recommendation**
The Pacific Flyway Council (Council) recommends no change in the special season framework for extended falconry seasons.

Falconry is a permitted means of taking migratory game birds in any state meeting the federal falconry standards in 50 CFR 21.29(k). Council recommends these states may select an extended season for taking migratory game birds in accordance with the following:

For all hunting methods combined, the combined length of the extended season, regular season, and any special or experimental seasons shall be 107 days for any species or group of species in a geographical area. Each extended season may be divided into 3 segments. Outside dates shall be between September 1 and March 10. The falconry daily bag limit for all permitted migratory game birds shall be 3 singly or in the aggregate, during extended falconry seasons, any special or experimental seasons, and regular hunting seasons in all states, including those that do not select an extended falconry season. General hunting regulations, including seasons and hunting hours, shall apply to falconry in each state listed in 50 CFR 21.29(k). Regular season bag and possession limits shall not apply to falconry. The falconry bag limit shall not be in addition to gun limits.

**Justification**
Impacts of falconry harvest on migratory bird populations are negligible. Most Pacific Flyway states select a 107-day season when available so in many cases, no additional days remain for an extended falconry season. During waterfowl season frameworks of less than 107 days, additional days would be available for extended falconry seasons and states may wish to consider extended falconry seasons at that time.

**Adoption**
Pacific Flyway Study Committee
August 21, 2019

Brandon Reishus, Chair

Contact: Blair Stringham

**Adoption**
Pacific Flyway Council
August 23, 2019

Kevin Blakely, Chair
Recommendation 7 – Special Early Canada Goose Season Framework

Recommendation
The Pacific Flyway Council (Council) recommends no change to the framework for special early Canada goose seasons.

A Canada goose season of up to 15 days during September 1–20 may be selected. The daily bag limit may not exceed 5 Canada geese, except in Pacific County, Washington, where the daily bag limit may not exceed 15 Canada geese. Areas open to hunting of Canada geese in each state must be described, delineated, and designated as such in each state’s hunting regulations.

Justification
The special early Canada goose hunting season aims at increasing harvest on resident Canada goose populations. The current management plan population objective and harvest strategies are based on the Breeding Population Index for both the Pacific Population (PP) and Rocky Mountain Population (RMP) of Canada geese.

The 2018 breeding population index for PP Canada geese is 346,991, a 1% decrease from the 2018 index of 350,684. The 3-year average (2017–2019) is 331,448, up 4% from the previous 3-year average of 319,583 (2016–2018).

The breeding population index for RMP Canada Geese in 2019 is 175,652, a 30% decrease from the 2018 index of 252,695. The 3-year average (2017–2019) is 205,338, down 11% from the previous 3-year average of 230,662 (2016–2018). The RMP management plan objective is a breeding population index of 117,000.

Adoption
Pacific Flyway Study Committee
August 21, 2019

Brandon Reishus, Chair

Adoption
Pacific Flyway Council
August 23, 2019

Kevin Blakely, Chair
Recommendation 8 – Special Youth, Veteran, and Active Military Personnel Waterfowl Hunting Days Season Framework

Recommendation
The Pacific Flyway Council (Council) recommends no change in the special youth, veteran, and active military personnel waterfowl hunting days season framework.

Council recommends states may select 2 days per duck-hunting zone, designated as “Youth Waterfowl Hunting Days,” and 2 days per duck-hunting zone, designated as “Veterans and Active Military Personnel Waterfowl Hunting Days,” in addition to their regular duck seasons. The days may be held concurrently. The Youth Waterfowl Hunting Days must be held outside any regular duck season on weekends, holidays, or other non-school days when youth hunters would have the maximum opportunity to participate. Both sets of days may be held up to 14 days before or after any regular duck season frameworks or within any split of a regular duck season, or within any other open season on migratory birds.

The daily bag limits may include ducks, geese, swans, mergansers, coots, moorhens, and gallinules and would be the same as those allowed in the regular season. Flyway species and area restrictions would remain in effect. Swans may only be taken by participants possessing applicable swan permits. Shooting hours are one-half hour before sunrise to sunset.

States may use their established definition of age for youth hunters. However, youth hunters must be under the age of 18. In addition, an adult at least 18 years of age must accompany the youth hunter into the field. This adult may not duck hunt but may participate in other seasons that are open on the special youth day. Veterans (as defined in section 101 of title 38, United States Code) and members of the Armed Forces on active duty, including members of the National Guard and Reserves on active duty (other than for training), may participate. All hunters 16 years of age or older must possess a Federal Migratory Bird Hunting and Conservation Stamp (also known as Federal Duck Stamp).

Justification
Council supports special opportunities for youth, veterans, and active military personnel to learn about waterfowl and wetland conservation, and waterfowl hunting. The intent of this special season is to (1) introduce hunters to the concepts of ethical utilization and stewardship of waterfowl and other natural resources (2) encourage youngsters and adults to experience the outdoors together, and contribute toward the long-term conservation of the migratory bird resource (3) to provide the best and safest learning environment for those who are interested in hunting (4) and provide a high-quality hunting experience for youth, veterans, and active military personnel.

The special season may help recruit non-hunters and novice hunters into the sport. In the long-term, participation of hunters in this special season may result in support for waterfowl and wetland conservation by fostering a more knowledgeable public, continued support for waterfowl hunting, and continued support for the protection and enhancement of wetland ecosystem.
Adoption
Pacific Flyway Study Committee
August 21, 2019

Brandon Reishus, Chair

Adoption
Pacific Flyway Council
August 23, 2019

Kevin Blakely, Chair

Contact: Blair Stringham
Recommendation 9 – Duck and Merganser Season Framework

Recommendation
The Pacific Flyway Council (Council) recommends no change to the duck season framework except to reduce the scaup daily bag limit from 3 to 2.

Council recommends a 107-day season with a daily bag limit of 7 ducks and mergansers, including no more than 2 female mallards, 1 pintail, 2 canvasbacks, 2 scaup, and 2 redheads. For scaup, the season length is 86 days, which may be split according to applicable zones and split duck hunting configurations approved for each state.

Justification
In 2008, a western mallard stock was recognized to inform duck harvest management decisions in the Pacific Flyway and is currently defined by two substocks: 1) those mallards breeding in Alaska and 2) those mallards breeding in British Columbia, California, Oregon, and Washington. Adjustments to optimization methods and AHM decision frameworks were developed to inform duck hunting regulations based on the breeding populations and habitat conditions observed in 2019 and the regulatory alternatives selected for the 2019 hunting season.

Duck and Merganser
In 2008, Council and the U.S. Fish and Wildlife Service (Service) adopted the Western Mallard Adaptive Harvest Management Protocol to inform harvest management decisions for ducks and mergansers in the Pacific Flyway.

The optimal regulatory alternative for the 2020 duck and merganser hunting season was calculated using: (1) the harvest-management objective for western mallards; (2) current regulatory alternatives; and (3) current population models. Based on the liberal regulatory alternative selected for the 2019 hunting season, the 2019 survey results of 0.89 million mallards observed in Alaska (0.36 million) and the southern Pacific Flyway (0.52 million), the optimal choice for the 2020 hunting season is the liberal regulatory alternative.

More restrictive regulations for duck species of concern (i.e., pintail, scaup, canvasback, and redhead) are established within the context of the general duck season, and each is based on a separate harvest strategy protocol after the general duck seasons length is determined.

Northern Pintail
In 2010, the Service and flyway councils adopted the adaptive harvest management protocol to inform harvest management decisions for pintails in all four flyways. For pintails, optimal regulatory alternatives for the 2020 hunting season in each flyway were calculated using: (1) an objective of maximizing long-term cumulative harvest; (2) current pintail regulatory alternatives, including a closed-season constraint of 1.75 million birds; and (3) current population models and their relative weights. Based on a liberal regulatory alternative with a 1-bird daily bag limit selected for 2019, the 2019 survey results of 2.27 million pintails observed at a mean latitude of 54.4 degrees, the optimal regulatory choice for the 2020 hunting season for all four flyways is the liberal regulatory alternative with a 1-bird daily bag limit.
Scaup
In 2008, the Service and flyway councils adopted the AHM protocol to inform harvest management decisions for scaup in all four flyways. For scaup, optimal regulatory alternatives for the 2020 hunting season were calculated using: (1) an objective to achieve 95% of long term cumulative harvest; (2) current scaup regulatory alternatives; and (3) the current population model and updated parameter estimates. The resulting regulatory strategy includes options conditional on the regulatory alternative selected the previous hunting season. Based on a moderate regulatory alternative selected in 2019, the 2019 survey results of 3.59 million scaup, the optimal regulatory choice for the 2020 hunting season for all four flyways is the restrictive regulatory alternative.

Canvasback
At the October 2015 Service Regulatory Committee (SRC) meeting, the SRC requested a group be convened to develop a decision support tool (DST) to deliver canvasback framework recommendations for the 2017–18 hunting seasons. A group of US Fish and Wildlife Service (Service) and state biologists was formed to develop the DST. At the November 2015 Harvest Management Working Group meeting, this group established criteria for developing the DST, which consisted of the following: (1) it needed to be biologically-based, (2) must use data that is currently available, (3) must be simple (i.e., could not require lengthy, intensive analyses), and (4) would be used as a short-term approach for developing harvest recommendations, preferably only for the next 1–2 hunting seasons. The group agreed that an “assessment of harvest potential” analysis, that used fixed values for demographic variables estimated for canvasbacks, would likely be sufficient to use as the framework for the DST. Results from the analysis recommend canvasback seasons open, with a 1-bird daily bag, provided the most recent breeding population estimate is above 460,000. Moreover, the daily bag limit can increase to 2 birds per day when the most recent population estimate is above 480,000. The committee recognizes that this analysis used maximum sustained yield as a harvest objective and thus may not be fully reflective of the long-term canvasback population and harvest objectives of the flyways. Given the short-term use of the tool and that the flyways will be addressing long-term canvasback objectives as part of the process of revisiting overall duck harvest objectives, the committee was comfortable moving forward with the DST.
Based on the 2019 survey results of 0.7 million canvasbacks, the regulatory choice defined by the DST for the 2020 hunting season for all four flyways is the liberal regulatory alternative with a 2-bird daily bag limit. It is important to emphasize the DST is intended to be used in the short-term while the Service and the flyways continue to address long-term canvasback objectives.

Redhead
The 2-bird daily bag limit on redheads has primarily been based on concern for canvasback populations. Because redheads look so similar to canvasbacks, managers tend to agree any increase in the redhead bag limit would likely translate to an increased canvasback harvest. Redhead regulations have been tied to canvasback regulations as far back as 1972, when the Secretary of the Interior formed a working group to investigate the status of these two species. At that time, there was a discussion of a season closure for both species. A 2-bird daily bag limit for redheads has been in place since at least 1973 in the Pacific Flyway.
Adoption
Pacific Flyway Study Committee
August 21, 2019

Brandon Reishus, Chair

Adoption
Pacific Flyway Council
August 23, 2019

Kevin Blakely, Chair
Recommendation 10 – Goose Season Framework

Recommendation
The Pacific Flyway Council (Council) recommends no changes to goose season frameworks for the Pacific Flyway except, the framework ending date for Canada goose and brant seasons with current ending dates of the last Sunday in January be modified to January 31st, to conform with ending dates for duck seasons, as allowed by the John D. Dingell, Jr. Conservation, Management, and Recreation Act of 2019.

The Council recommends that the 2020–21 brant season frameworks be determined based on the harvest strategy in the Council’s management plan for the Pacific population of brant pending results of the 2020 Winter Brant Survey (WBS). If results of the 2020 WBS are not available, results of the most recent WBS should be used.

Justification
Monitoring activities over the last year indicated most goose populations are at or above levels justifying continued liberal goose hunting frameworks for most populations and areas.

The John D. Dingell, Jr. Conservation, Management, and Recreation Act (Act) established that the ending date for duck seasons in all four flyways shall not be later than January 31st. Previously, the ending date, under a liberal regulation package, was the last Sunday in January. In many jurisdictions, the ending framework date for goose seasons was also the last Sunday in January, to conform with duck season frameworks. However, the Act only applied to duck, mergansers, and coots. This change will realign the duck and goose season ending dates in those jurisdictions where, previous to the Act, they had been the last Sunday in January. It is anticipated this change will have no biological impact. See Attachment 1 for draft framework language.

Proposed changes to goose hunting zones in the Pacific Flyway
(Zone changes only require concurrence of the Flyway Representative)

In Washington modify Goose Management Area (GMA) 1 to include the portion of Skagit, Snohomish, and Whatcom Counties west of Highway (State Route) 9 and modify GMA 3 to include all other parts of western Washington not included in GMAs 1, 2-Coast, or 2-Inland.

Justification to modify zones
• While county-level delineation has been used to define Goose Management Area boundaries in Washington, the recent shift of Wrangel Island snow goose harvest timing past the end of January has highlighted discrepancies between goose distribution, harvest opportunity, and the ability to address rising agricultural depredation concerns using harvest.
• This modification to GMA1 zone boundaries (a goose hunting zone intended to address the Fraser-Skagit snow goose winter flock objective) reduces confusion and undue burden on goose hunters that are not likely to encounter snow geese based on aerial photo survey results for abundance and distribution of flocks.

• The inclusion of the Whatcom County segment and the appropriate eastern boundary would be considered during public input sought during Washington’s rule-making process for proposed changes prior to Fish and Wildlife Commission decision.

Adoption
Pacific Flyway Study Committee Contact: Brandon Reishus
August 21, 2019

Brandon Reishus, Chair

Adoption
Pacific Flyway Council
August 23, 2019

Kevin Blakely, Chair
Attachment 1

**Draft Pacific Flyway Regular Goose Season Frameworks**

Season dates, outside dates, and limits

Canada Geese and Brant: Except as subsequently noted, 107-day seasons may be selected with outside dates between the Saturday nearest September 24 (September 21) and the last Sunday in January (January 26) **January 31**. In Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming, the daily bag limit is 4 Canada geese and brant in the aggregate. In California, Oregon, and Washington, the daily bag limit is 4 Canada geese. For brant, in California, Oregon and Washington, a 37-day season may be selected. Days must be consecutive. Washington and California may select hunting seasons for up to 2 zones. The daily bag limit is 2 brant and is in addition to other goose limits. In Oregon and California, the brant season must end no later than December 15.

White-fronted Geese: Except as subsequently noted, 107-day seasons may be selected with outside dates between the Saturday nearest September 24 (September 21) and March 10. The daily bag limit is 10.

Light Geese: Except as subsequently noted, 107-day seasons may be selected with outside dates between the Saturday nearest September 24 (September 21) and March 10. The daily bag limit is 20.

Split Seasons: Unless otherwise specified, seasons for geese may be split into up to 3 segments. Three-way split seasons for Canada geese and white-fronted geese require Pacific Flyway Council and U.S. Fish and Wildlife Service approval and a 3-year evaluation by each participating State.

**CALIFORNIA**
The daily bag limit for Canada geese is 10.

Balance of State Zone: A Canada goose season may be selected with outside dates between the Saturday nearest September 24 (September 21) and March 10. In the Sacramento Valley Special Management Area, the season on white-fronted geese must end on or before December 28, and the daily bag limit is 3 white-fronted geese. In the North Coast Special Management Area, hunting days that occur after the last Sunday in January (January 26) **January 31** should be concurrent with Oregon's South Coast Zone.

Northeastern Zone: The white-fronted goose season may be split into 3 segments.

**OREGON**
The daily bag limit for light geese is 6 on or before the last Sunday in January (January 26).

Harney and Lake County Zone: For Lake County only, the daily white-fronted goose bag limit is 1.

Northwest Permit Zone: A Canada goose season may be selected with outside dates between the Saturday nearest September 24 (September 21) and March 10. Goose seasons may be split into 3
segments. The daily bag limits of Canada geese and light geese are 6 each. In the Tillamook County Management Area, the hunting season is closed on geese.

South Coast Zone: A Canada goose season may be selected with outside dates between the Saturday nearest September 24 (September 21) and March 10. The daily bag limit of Canada geese is 6. Hunting days that occur after the last Sunday in January (January 26) should be concurrent with California's North Coast Special Management Area. Goose seasons may be split into 3 segments.

UTAH
A Canada goose and brant season may be selected in the Wasatch Front Zone with outside dates between the Saturday nearest September 24 (September 21) and the first Sunday in February (February 2).

WASHINGTON
The daily bag limit for light geese is 6.

Areas 2 Inland and 2 Coastal (Southwest Permit Zone): A Canada goose season may be selected with outside dates between the Saturday nearest September 24 (September 21) and March 10. Goose seasons may be split into 3 segments.

Area 4: Goose seasons may be split into 3 segments.

PERMIT ZONES
In Oregon and Washington permit zones, the hunting season is closed on dusky Canada geese. A dusky Canada goose is any dark-breasted Canada goose (Munsell 10 YR color value 5 or less) with a bill length between 40 and 50 millimeters. Hunting of geese will only be by hunters possessing a State-issued permit authorizing them to do so. Shooting hours for geese may begin no earlier than sunrise. Regular Canada goose seasons in the permit zones of Oregon and Washington remain subject to the Memorandum of Understanding entered into with the Service regarding monitoring the impacts of take during the regular Canada goose season on the dusky Canada goose population.
Recommendation 11 – Rail Season Framework

Recommendation
The Pacific Flyway Council (Council) recommends no change in season frameworks for sora and Virginia rails, except the closing date be changed to January 31.

Council recommends a framework including sora and Virginia rail in the Pacific Flyway portions of Colorado, Montana, New Mexico, and Wyoming. Season length of 70 days, and daily bag and possession limits of 25 sora and Virginia rail in the aggregate. Season length may be split into two segments. The season shall be closed in the remainder of the Pacific Flyway.

Justification
The most recent Breeding Bird Survey (BBS) data available (2015) estimated annual change in the Virginia rail population in the Western Region was -0.28% over the long-term (1966–2015), and 2.12% over the short-term (2005–2015). BBS estimates for the same time period for sora was 0.20% for the long-term and 1.24% over the short-term. The BBS western region data for sora and Virginia rail indicates a stable population; however, data (i.e., sample size, abundance, and precision) to detect population trends may be inadequate for this species.

Hunter participation and harvest estimates for sora and rails are obtained from the Migratory Bird Harvest Information Program. However, no Pacific Flyway harvest information is available because rail seasons are only open in the western portions of Colorado, Montana, New Mexico, and Wyoming within the Pacific Flyway.

Adoption
Pacific Flyway Study Committee
August 21, 2019

Brandon Reishus, Chair

Adoption
Pacific Flyway Council
August 23, 2019

Kevin Blakely, Chair
Recommendation 12 – Swan Season Framework

Recommendation
The Pacific Flyway Council (Council) recommends no changes to swan season frameworks for the Pacific Flyway, except to allow the season to be split into two segments and allow a swan season in northern Idaho with the following parameters:

1) Hunting area may include the four most northern counties (Benewah, Bonner, Boundary, and Kootenai),
2) Up to 50 hunting permits may be issued,
3) Only 1 permit may be issued per hunter, and
4) All hunters that harvest a swan must complete and submit a harvest report with the bill measurement and color information from the harvested swan within 72 hours of harvest for species determination.

Recommended Framework
In portions of the Pacific Flyway (Idaho, Montana, Nevada, and Utah), an open season for taking a limited number of swans may be selected. These seasons are also subject to the following conditions:

Outside Dates: Between the Saturday nearest September 24 and January 31.

Hunting Seasons: Seasons may not exceed 107 days.

Permits: Swan hunting is by permit only. Permits will be issued by the State and will authorize each permittee to take no more than 1 swan per season with each permit. Only 1 permit may be issued per hunter in Idaho, Montana and Utah, 2 permits may be issued per hunter in Nevada. The total number of permits issued may not exceed 50 in Idaho, 500 in Montana, 650 in Nevada, and 2,750 in Utah.

Quotas: The swan season in the respective State must end upon attainment of the following reported harvest of trumpeter swans: 20 in Utah and 10 in Nevada. There is no quota in Idaho and Montana.

Monitoring: Each State must evaluate hunter participation, species-specific swan harvest, and hunter compliance in providing either species-determinant parts (at least the intact head) or bill measurements (bill length from tip to posterior edge of the nares opening, and presence or absence of yellow lore spots on the bill in front of the eyes) of harvested swans for species identification. Each State should use appropriate measures to maximize hunter compliance with the State’s program for swan harvest reporting. Each State must achieve a hunter compliance of at least 80 percent in providing species-determinant parts or bill measurements of harvested swans for species identification or subsequent permits will be reduced by 10 percent in the respective State. Each State must provide to the Service by June 30 following the swan season a report detailing hunter participation, species specific swan harvest, and hunter compliance in reporting harvest. In Idaho and Montana, all hunters that harvest a swan must complete and submit a harvest report with the
bill measurement and color information from the harvested swan within 72 hours of harvest for species determination. In Utah and Nevada, all hunters that harvest a swan must have the swan or species-determinant parts examined by a State or Federal biologist within 72 hours of harvest for species determination.

Other Provisions: In Utah, the season is subject to the terms of the Memorandum of Agreement entered into with the Service in July 2019, regarding harvest monitoring, season closure procedures, and education requirements to minimize take of trumpeter swans during the swan season.

Justification
A recent Pacific Flyway review of RMP trumpeter swan populations and hunting impacts resulted in a white paper discussing the impacts of hunting on trumpeter swans (Gower et al. 2018). As a result of this review, restructuring of the Pacific Flyway swan hunting framework created allowances for outside dates of swan regulations to better align with duck hunting season frameworks. However, these changes did not take into consideration that frameworks for duck seasons allow seasons to be split into two segments. This proposal would change the swan hunting framework to allow swan hunting states the ability to align duck and swan seasons, including split segments.

Additionally, Council recently revised their management plans for tundra and trumpeter swans. These management plans include updated swan population objectives, cooperative management agreements, harvest management guidelines, and commitments to monitor population status and harvest. These updated management plans for tundra and trumpeter swans allow for an open swan hunting season in the Pacific Flyway, including northern Idaho, based on current population status. A state of Idaho proposal for a swan hunting season in northern Idaho was endorsed by Council in September 2018, and is consistent with Council management plans for tundra and trumpeter swans, but also the 2003 Environmental Assessment establishing an operational swan season framework in the Pacific Flyway, and applicable hunting regulations in 50 CFR 20.

An Environmental Assessment to establish a framework for swan hunting in northern Idaho will consider the action to allow a limited harvest (<50) of swans in northern Idaho, and review current swan harvest management, population status, population objectives, and cumulative impacts in the Pacific Flyway. This Environmental Assessment will tier off of the Final Supplemental Environmental Impact Statement on issuance of annual regulations permitting the hunting of migratory birds (U.S. Department of the Interior 2013) and the four Environmental Assessments and Findings of No Significant Impact on the swan season framework (U.S. Department of the Interior 1995, 2000, 2001, and 2003). When a Final Environment Assessment is published, it would allow for swan hunting to begin in northern Idaho during fall 2020.

Detected incidental take of trumpeter swans within those states participating in a tundra swan hunt (Montana, Nevada, and Utah) has been minimal with less than 2% of harvested swans being classified as trumpeters. During the 2018 swan season, five trumpeter swans were harvested in Utah, 11 were harvested in Montana, and none were harvested in Nevada. It is anticipated that few trumpeter swans will be harvested in Idaho’s hunt and that any trumpeter swans harvested would likely be from the Canadian segment of the RMP.

Adoption
Pacific Flyway Study Committee
August 21, 2019

Brandon Reishus, Chair

Contact: Blair Stringham

Adoption
Pacific Flyway Council
August 23, 2019

Kevin Blakely, Chair
Recommendation 13 – Rocky Mountain Population Sandhill Crane Season Framework

Recommendation
The Pacific Flyway Council (Council) recommends no change in the season framework for the Rocky Mountain Population (RMP) of sandhill cranes, except to change the status of the Estancia Valley crane hunting season from experimental to operational.

Council recommends allowable harvest be determined based on the formula described in the Pacific and Central Flyway Management Plan for the Rocky Mountain Population of Sandhill Cranes.

Justification
Currently, in New Mexico, the sandhill crane season in the Estancia Valley is experimental, with a requirement to monitor the magnitude and subspecific composition of the harvest and to assign Greater sandhill cranes harvested during this season to the RMP crane quota. From 2017 to 2019, harvest in the Estancia Valley season was monitored via mandatory hunter check stations. During this time period, approximately 1-2% of harvest was RMP sandhill cranes (1-2 birds out of a harvest of approximately 100 birds in the EV hunt). New Mexico will continue to monitor the magnitude and subspecific composition of the harvest in the Estancia Valley season using bill cards and assign greater sandhill crane harvest to the RMP crane quota.

Adoption
Pacific Flyway Study Committee
August 21, 2019

Brandon Reishus, Chair

Adoption
Pacific Flyway Council
August 23, 2019

Kevin Blakely, Chair
Recommendation 14 – Alaska Season Framework

Recommendation
The Pacific Flyway Council (Council) recommends no changes to the Alaska season framework for the 2020-2021 season, except reduce the allowable total harvest of emperor geese from 1000 to 500 birds.

The Council recommends that the 2020–21 brant season frameworks be determined based on the harvest strategy in the Council’s management plan for the Pacific population of brant pending results of the 2020 Winter Brant Survey (WBS). If results of the 2020 WBS are not available, results of the most recent WBS should be used.

Justification
Ducks: Council recommends retention of the current framework of 107-day seasons and basic daily limits ranging from 7–10 over five regulatory zones. An adaptive regulatory regime guides Pacific Flyway duck regulations based on the Western Mallard Model, which is defined by two subsstocks: (1) those birds breeding in the Alaska and the Yukon Territory, and (2) those birds breeding in California, Oregon, Washington, and British Columbia. The 2019 estimated total breeding population size of western mallards was 890,000 (SE: 50,000); the combined totals of the Alaska-Yukon Territory (360,000; SE: 40,000) and California-Oregon-Washington-British Columbia (520,000; SE: 40,000). This is a decrease from the estimate of 1,025,003 mallards in 2018. Based on these results, the prescribed regulatory alternative is liberal. Alaska accounted for ~2% of the Pacific Flyway duck harvest in 2018.

Canvasbacks: Council recommends retention of the current bag/possession limit of 2/6 canvasbacks for Alaska as prescribed by the decision support tool. The 2019 breeding population estimate was 652,000, a 5% decrease from 686,084 in 2018, and 10% above the 1955–2019 long-term average of 591,000. Since 2015, a new harvest strategy for canvasbacks has not been available. However, a decision support tool was developed as an interim strategy that uses available information (1994–2014) on population size, growth rate, survival, and harvest to derive an optimal harvest policy. Under the decision support tool, the season is closed when the observed population is below 460,000, a 1-bird daily bag limit when between 460,000–480,000 and a 2-bird bag limit when above 480,000. Given the 2019 canvasback population is greater than 480,000, a 2-bird bag for the 2020–2021 season is recommended. The estimated fall-winter harvest of canvasbacks in Alaska from the Harvest Information Program (HIP) was zero from 2014-2017.

Sea Ducks: Council recommends no change to the current sea duck bag/possession limits of 10 daily, 20 in possession, singly or in the aggregate, including no more than 6 each of either harlequin or long-tailed ducks. Lower limits are required for nonresident hunters. Sea ducks include scoters, common and king eiders, harlequin ducks, long-tailed ducks, and common and red-breasted mergansers. The season is closed for Steller’s and spectacled eiders.

Geese: Council recommends no change to the seasons and bag limits for geese in Alaska, except for a reduction in allowable harvest from 1000 to 500 emperor geese. Most goose populations are near or above their management plan population objectives (Table 1), supporting no change in the Alaska frameworks.
Table 1. Current population status and management plan objectives for Pacific Flyway goose populations in Alaska

<table>
<thead>
<tr>
<th>Species</th>
<th>Recent Survey Index</th>
<th>3-year Average Index</th>
<th>Management Index</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pacific white-fronted geese</td>
<td>Estimate</td>
<td>Year</td>
<td>Estimate</td>
<td>Years</td>
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<tr>
<td></td>
<td>479,289</td>
<td>2019</td>
<td>601,650</td>
<td>2017-2019</td>
</tr>
<tr>
<td>Midcontinent white-fronted geese</td>
<td>774,097</td>
<td>2018</td>
<td>848,613</td>
<td>2016-2018</td>
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<tr>
<td>Cackling Canada geese</td>
<td>205,262</td>
<td>2019</td>
<td>235,137</td>
<td>2017-2019</td>
</tr>
<tr>
<td>Pacific lesser Canada geese</td>
<td>13,066</td>
<td>2019</td>
<td>5,962</td>
<td>2017-2019</td>
</tr>
<tr>
<td>Taverner’s Canada geese</td>
<td>58,924</td>
<td>2019</td>
<td>50,177</td>
<td>2017-2019</td>
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<tr>
<td>Aleutian Canada geese</td>
<td>198,905</td>
<td>2019</td>
<td>179,596</td>
<td>2017-2019</td>
</tr>
<tr>
<td>Dusky Canada geese</td>
<td>17,727</td>
<td>2019</td>
<td>14,408</td>
<td>2017-2019</td>
</tr>
<tr>
<td>Vancouver Canada geese</td>
<td>No data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emperor geese</td>
<td>26,585</td>
<td>2019</td>
<td>28,928</td>
<td>2017-2019</td>
</tr>
<tr>
<td>Pacific brant</td>
<td>160,573</td>
<td>2019</td>
<td>149,647</td>
<td>2017-2019</td>
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<td>Western arctic lesser snow geese</td>
<td>446,599</td>
<td>2013</td>
<td></td>
<td>2007, 09, 13</td>
</tr>
<tr>
<td>Wrangel Island lesser snow geese</td>
<td>442,000</td>
<td>2019</td>
<td>344,600</td>
<td>2017-2019</td>
</tr>
</tbody>
</table>

The fall-winter harvest of emperor geese in Alaska was resumed as a registration permit hunt in 2017 after more than 30 years of closed seasons. The management plan for emperor geese was revised and adopted by Council in 2016 to include harvest guidelines for regulations. The harvest strategy is based on using the indicated total bird index from the Yukon-Kuskokwim Delta Coastal Zone Survey (YKDCZS) to assess population status relative to prescribed regulatory thresholds. The harvest strategy specifies fall-winter harvest will be open with an annual quota of 1,000 birds if the indicated total bird index from the previous year is greater than 23,000 birds; but when the indicated total bird index is below 28,000 birds, a restrictive quota of 500 birds will be considered. The 2019 emperor goose total bird index was 26,585 (95% CI = 24,161–29,008) and below the 28,000-bird threshold, which triggers a reduction in the allowable harvest quota from 1,000 to 500 birds for the 2020-21 fall-winter hunt.

Western Tundra Swans: Council recommends no change to the current framework of a permit hunt in Units 17, 18, 22, and 23 with no more than 3 swans authorized per permit. The western tundra swan population is managed using the three-year average of the breeding ground index, which includes the combined total bird indices from the Waterfowl Breeding Population and Habitat Survey (Strata 8, 9, 10, and 11) and the YKDCZS. The 2019 breeding ground index was 101,102 swans. The three-year (2017-2019) average was 127,556 swans, well above the management plan objective of 60,000 tundra swans. In 2018, 109 of the allowed 1,300 permits were issued and the reported fall harvest was 38 swans, lower than the long-term average of 54.

Midcontinent Lesser Sandhill Cranes: Council recommends no change to the current framework of a daily bag of 3 cranes in Units 11-13 and 18-26. The population is well above management thresholds. The 2019 index based on photo-corrected Central Platte River Valley aerial surveys is 946,000 cranes and the three-year average (2017–2019) of 840,000 cranes exceeds the established population objective range of 350,000–475,000 cranes. The 2018 estimated fall-winter harvest in Alaska was 705 cranes (HIP). The fall-winter Alaska harvest accounted for about 1.5% of the North American harvest in 2018.

Pacific Population Lesser Sandhill Cranes: Council recommends no change to the current framework of a daily bag of 2 cranes in Units 1-10, 14-17. Alaska is the only state that harvests this population. The 2017 fall-winter harvest estimate of cranes in Units 1-10 and 14-17 was 180 cranes (HIP).

Snipe: Council recommends no change to the current framework of a daily bag limit of 8 birds in all Units. No snipe were reported harvested during the 2017 fall-winter harvest in Alaska (HIP).
Falconry: Council recommends no change to the current framework of a daily bag limit of 3 birds. There are currently 54 registered falconers in Alaska. Of these, 25 falconers have a total of 48 falconry birds in possession and migratory game bird harvest is negligible.

**Adoption**
Pacific Flyway Study Committee
August 21, 2019

Brandon Reishus, Chair

**Adoption**
Pacific Flyway Council
August 23, 2019

Kevin Blakely, Chair
Recommendation 15 – Subsistence Season Framework

Recommendation
The Pacific Flyway Council (Council) endorses the Alaska Migratory Bird Co-management Council recommended 2020 regulations for spring and summer subsistence harvest of migratory birds and their eggs in Alaska (50 CFR 92), which are unchanged from the 2019 season, with the following exceptions:

1) Change the boundary between the Northern and Southern Units of the North Slope region of Alaska,
2) Allow flexible dates for the 30-day closure period in the North Slope region of Alaska,
3) Change the southern boundary of the Special Brant Hunting Season in the North Slope region of Alaska, and
4) For the Kodiak Island Roaded Area closure in the Kodiak Archipelago region of Alaska, allow migratory bird hunting and egg gathering by registration permit only for a 3-year trial period (2020–2022) after which the regulation will sunset. The Roaded Area would remain closed to hunting and egg gathering for Arctic terns, Aleutian terns, mew gulls, and emperor geese.

Council also supports the AMBCC course of action (detailed below) to discuss implementing conservation measures for the 2020 spring-summer hunt of emperor geese at the next non-regulatory meeting in September 2019. The 2019 management index of emperor geese dropped below a prescribed threshold which triggers consideration of conservation measures identified in the AMBCC Emperor Goose Management Plan (2016).

Justification
Regulations allow for continuation of customary and traditional subsistence uses of migratory birds in Alaska. Regulations were developed by the AMBCC, which consists of the US Fish and Wildlife Service (Service), the Alaska Department of Fish and Game (ADFG), and 11 Alaska Native Regional Management bodies. The AMBCC has proposed to maintain the 2019 spring-summer subsistence harvest regulations for migratory birds in 2020 with the four amendments below.

Unit boundary change in the North Slope region: The proposed change would adjust the boundary between the Northern and Southern Units of the North Slope region in Alaska to move the communities of Atqasuk and Wainwright from the Southern to Northern Unit (Figure 1). The North Slope region is divided into three Units (Northern, Southern and Eastern) due to its large geographic extent. Each of the Units is defined by a unique set of season dates, including a 30-day closure period, to accommodate high variation in snowmelt patterns, species composition, presence of eggs, and hunter access across the region. Currently, season dates in the Northern Unit better reflect the timing of hunting activities in Atqasuk and Wainwright, relative to break-up patterns and the phenology of migratory birds, than those of the Southern Unit. Accordingly, the proposed change will result in season dates that more effectively balance the opportunity for hunters to harvest birds and eggs with an appropriate 30-day closure period to protect birds during
the nesting period. This change in regulation is not anticipated to result in increased harvest of birds and eggs in the North Slope region of Alaska.

The proposed boundary descriptions for the Northern and Southern Units are as follows:

Northern Unit: From Icy Cape, everything east of longitude line 161°55′W and north of latitude line 69°45′N to the west bank of Sagavinirktok River and north to 71°.

Southern Unit: Southwestern North Slope Borough boundary northeast to Icy Cape, and everything west of longitude line 161°55′W and south of latitude line 69°45′N to the west bank of the Sagavinirktok River and south along the west bank to the North Slope Borough boundary, then west to the beginning.

Figure 1. North Slope region of Alaska proposed boundary change between the Northern and Southern Units.

North Slope region 30-day closure period: Currently, all Alaska subsistence harvest regions, apart from the Yukon-Kuskokwim Delta (YKD) region, use a fixed range of dates to denote the mandatory 30-day closure period during which all bird and egg harvest ceases. The 30-day closure period is timed to protect birds and eggs during the primary nesting period, while allowing some egg harvest during early nesting. The fixed dates of the 30-day closure period were based on the average timing of nest initiation in each subsistence region and, in general, the season dates established for the North Slope region are appropriate. However, the actual timing of nesting on
the North Slope varies annually in response to multiple environmental and biological factors (e.g., timing of snowmelt, ambient temperature, and birds’ body condition). Some evidence indicates that climate change is amplifying this annual variation, particularly in the Arctic, resulting in an overall long-term trend toward earlier nesting. Thus, in some years, the fixed dates of the 30-day closure do not align well with the nesting period. This proposal would allow the dates of the 30-day closure periods in the North Slope region to be changed from the fixed dates published in the Federal Register (Register) to more flexible, annually derived dates if environmental and biological conditions warrant such a change. If a change in dates is unwarranted, the dates published in the Register would apply.

A North Slope-region working group will be established in fall 2019 that may include members from the North Slope Borough Fish and Game Management Committee, North Slope Borough Department of Wildlife, Yukon Delta National Wildlife Refuge (YDNWR), Alaska Region Service – Migratory Bird Management, ADFG, and local villagers to develop a protocol for determining the annual process of setting 30-day closure dates, and communicating that information to hunters across the North Slope region. The protocol will be modeled similarly to that used by the YKD region, where the YDNWR and Association of Village Council Presidents (AVCP) annually agree on a closure date based on reports of when most birds are starting to nest from field biologists and local villagers. Upon agreeing to closure dates, the YDNWR and AVCP prepare and distribute outreach materials to announce the closure dates. The North Slope-region working group will develop the protocol in advance of rulemaking for the 2020 spring-summer season.

Special Black Brant Hunting Season boundary: Non-breeding and failed-breeding brant annually migrate from the YKD northward along the western coast of Alaska to the Teshekpuk Lake area on the North Slope to undergo wing molt. Current regulation allows for the harvest of migrating brant (Special Black Brant Hunting Season) from June 20-July 5 along the coastline and in open water around the village of Wainwright. The proposed change would extend the boundary associated with the Special Black Brant Hunting Season south and west to include the entirety of Kasegaluk Lagoon (Figure 2) to provide hunters from the village of Point Lay the opportunity to legally harvest migrating brant. This change is not anticipated to result in increased harvest of brant because it would legalize an ongoing traditional harvest by the villagers of Point Lay during this period.

The proposed boundary description is as follows:

Special Black Brant Hunting Season: From June 20-July 5. The open area consists of the coastline from the mean high-water line outward to the North Slope Borough boundary to include open water and barrier islands from southern Kasegaluk Lagoon from latitude line 69°16’N to the north and east to longitude line 158°30’W.

Kodiak Island Roaded Area closure: The proposed change would open the Kodiak Island Roaded Area (Roaded Area) to spring-summer subsistence hunting of migratory birds and egg gathering by registration permit for a 3-year trial period (2020-2022) after which the regulation will sunset. The Roaded Area would remain closed to hunting and egg gathering for Arctic terns, Aleutian terns, mew gulls, and emperor geese. The purpose of the proposed regulation is to allow residents of the Roaded Area the opportunity to participate in subsistence activities without the need for a boat. Current regulation closes the Roaded Area to all subsistence migratory bird hunting and egg
gathering but permits these activities in adjacent marine waters beyond 500’ from shore, including offshore islands where access requires a watercraft.

Figure 2. North Slope region of Alaska proposed boundary extension for the Special Black Brant Hunting Season.

The proposed subsistence hunt in the Roaded Area will be administered as a registration permit hunt with a harvest reporting requirement for a 3-year trial period. Following the 3-year trial period, the Roaded Area would close in 2023 to migratory bird hunting and egg gathering; reopening the Roaded Area would require a new proposal be approved in 2022. The Roaded Area has been closed since spring 2003 when spring-summer subsistence hunting and egg gathering was legalized, so there is a lack of subsistence harvest information for this area. The registration permit with reporting will help enumerate participants, quantify bird and egg harvest, and describe harvest composition for the 3-year trial period; information currently lacking that can be used to assess the impact of opening the Roaded Area and inform a proposal/decision to reopen in future years. The Roaded Area registration permit will be administered by the ADFG Division of Subsistence in cooperation with the Sun'aq Tribe of Kodiak. Administration of the registration permit will be akin to that of the subsistence registration permit hunt conducted successfully in Cordova, Alaska, that has a reporting rate of 93%.

The AMBCC recognized the necessity to protect species of conservation concern if a subsistence registration permit hunt is approved for the Roaded Area; thus, spring-summer subsistence hunting and egg gathering in the Roaded Area would remain closed to Arctic terns, Aleutian terns, mew gulls, and emperor geese. Arctic and Aleutian tern nesting colonies have declined by >80% in
Alaska over the last 20 years, and only a few colonies remain on Kodiak Island, the largest of which are within the Roaded Area; thus, protecting these species from further decline is a high priority of multiple stakeholders including the AMBCC. Furthermore, the Roaded Area would remain closed for mew gulls because colony-level disturbance from targeted mew gull harvest could be detrimental to nesting terns and mew gull nests and eggs may be confused with those of terns resulting in incidental harvest of tern eggs. Also, the Roaded Area would remain closed to emperor geese out of concern that it would provide unrestricted hunter access to a relatively small wintering population of emperor geese that utilize several bays near the road system, potentially increasing harvest vulnerability of a carefully managed species.

Spring-summer hunt of emperor geese: In 2016, the AMBCC adopted an Emperor Goose Management Plan (Plan) to guide regulations for a spring-summer subsistence harvest of emperor geese and their eggs, which were opened to legal harvest in spring 2017. The Plan was developed in conjunction with the newly revised Pacific Flyway Management Plan for Emperor Geese (2016) that specifies guidelines for an allowable 1000 bird fall-winter registration permit hunt of emperor geese. The two management plans complement one another and contain identical population assessment methods, population objectives, and regulatory thresholds in the harvest strategy. The harvest strategy in the Plan is based on using the indicated total bird index from the Yukon-Kuskokwim Delta Coastal Zone Survey to assess population status relative to the population objective (34,000 indicated total bird index) and prescribed regulatory thresholds. The harvest strategy specifies the spring-summer subsistence harvest will be open to customary and traditional practices if the indicated total bird index from the previous year is greater than 23,000 birds. However, if the indicated total bird index is less than 28,000 birds, the AMBCC will consider implementing regulatory or non-regulatory conservation measures. The closure threshold of 23,000 birds is equivalent to approximately 120,000 emperor geese based on a theta-logistic model developed by Alaska Region USFWS-Migratory Bird Management. The conservation measures agreed to by the AMBCC include consideration of increased outreach and education, cessation of egg collection, elder and ceremonial harvest only, or other measures as identified by parties to the Plan. The 2019 emperor goose indicated total bird index was 26,585 (95% CI = 24,161–29,008) and below the 28,000-bird threshold, thus triggering consideration of conservation measures for the 2020 spring-summer subsistence hunt. The statewide estimated harvest of emperor geese during the spring-summer subsistence hunt in 2017 was 2,344 (CIP: 83%) birds and 1,443 eggs (CIP: 145%); and reported harvest from the 2017-2018 fall-winter permit hunt was 128 birds.

The timing of Service notification of emperor goose population status (July 2019) was mismatched with the AMBCC regulatory meeting (April 2019); thus, the AMBCC was unable to consider conservation measures for Council endorsement in this Recommendation. The AMBCC plans to discuss conservation measures for the 2020 spring-summer season at the next non-regulatory meeting in September 2019. If the approved conservation measures require a change to the Alaska subsistence framework (e.g., a change to the length of the closure period or season dates), the AMBCC will submit the proposed changes directly to the Service Regulations Committee for consideration at the October 2019 regulatory meeting, which may require out-of-cycle endorsement by the Pacific Flyway Council.
Adoption
Pacific Flyway Study Committee
August 21, 2019

Brandon Reishus, Chair

Adoption
Pacific Flyway Nongame Technical Committee
August 21, 2019

Neil Clipperton, Chair

Adoption
Pacific Flyway Council
August 23, 2019

Kevin Blakely, Chair
Recommendation 16 – Guidelines for Dove Zones and Split Seasons in the Western Management Unit

Recommendation
The Pacific Flyway Council (Council) recommends additional options be added to the existing criteria for dove zones and split seasons published on August 21, 2015 (80 FR 51094) including allowing states in the Western Management Unit to select seasons in one or two zones with up to two segments per zone.

Justification
In 2004, the USFWS (Service) asked the Flyway Councils and the technical committees to review the current policies regarding the use of zones and splits for dove hunting. The Service adopted zone and split guidelines for dove seasons in 2006 for implementation in 2007, with the expectation the selection would conform to the same fixed 5-year periods as used for ducks.

At that time, the Western Management Unit (WMU) had differing frameworks for California and Arizona versus the rest of the WMU states (Nevada, Utah, Oregon, Washington, and Idaho; hereafter referred to as northern WMU states). Season lengths in California and Arizona could be up to 60 days with one or two segments. The northern WMU states were limited to a 30-day season with no option for a split season. No WMU states had the ability to select dove seasons by zone.

In 2006, zones and split season guidelines for doves were established for the Eastern and Central management units. Beginning in 2014, the season length in the northern WMU states was expanded to 60 days. With the longer seasons afforded northern WMU states, there was interest in having two season segments in some states to allow dove harvest opportunity during November – January, in areas where mourning doves congregate for the winter (e.g., the valleys of western Oregon or southern Nevada). However, splitting seasons without establishing zones would mean seasons would need to be split statewide. In this case, high elevation landscapes in eastern Oregon or northern Nevada, where doves are common in September, would be forced to have a segment of their season during the winter, when mourning doves are largely absent. A split season was allowed in 2016, for use during 2017 and later seasons, but at this time no northern WMU state has taken advantage of the opportunity because of the inability to also hold differential seasons by zone.

If this change were implemented, it is likely that mourning dove harvest would increase in those states where zones were established. It is not possible to estimate the magnitude of the harvest increase, though Harvest Information Program survey data could be partitioned to develop harvest estimates for early season harvest (not expected to differ with zoning) versus late season harvest. It is expected that nearly all harvest in a late season zone would be additional to current harvest levels, since most harvest occurs in early September.
Adoption
Pacific Flyway Study Committee
August 21, 2019

Brandon Reishus, Chair

Contact: Brandon Reishus

Adoption
Pacific Flyway Council
August 23, 2019

Kevin Blakely, Chair
Recommendation 17 – Guidelines for Duck Zones and Splits

Recommendation
The Pacific Flyway Council (Council) recommends additional options be added to the existing criteria for duck zones and split seasons published on August 21, 2015 (80 FR 51091) including:

1) One zone in each state could be comprised of up to two geographically separated areas.
2) Two and three zones with up to 3 season segments per zone.

Justification
Current criteria for duck zones and split seasons adopted by the Service requires that a zone must have a contiguous boundary. Zones and split season options currently include:

1) One zone with up to three season segments (two splits)
2) Two zones with up to two season segments per zone (one split)
3) Three zones with up to two season segments per zone (one split)
4) Four zones with one season segment per zone (no splits)

The criteria for zone boundaries do not consider biological or sociological factors and lack flexibility needed to address the variation in hunting opportunity in adjacent regions. With expanded federal season date framework (133 available days during the 2019/20 season), the current zone and split criteria limit States’ ability to align season dates that allow greatest opportunity for participation and harvest. The recommended options should not significantly increase harvest.

Adoption
Pacific Flyway Study Committee
August 21, 2019

Brandon Reishus, Chair

Adoption
Pacific Flyway Council
August 23, 2019

Kevin Blakely, Chair
Recommendation 18 – Raven Core Team Letter

Recommendation
The Pacific Flyway Council (Council) approves sending the attached letter to the Assistant Director of the U.S. Fish and Wildlife Service (Service) Migratory Bird Program regarding the Raven Core Team.

Justification
The Council supports the Raven Core Team (Team) and encourages the Team to work swiftly toward the development of effective strategies to address common raven (Corvus corax, ‘raven’) conflicts. The Conceptual Framework for Evaluating and Responding to Conflicts with Migratory Bird Species, recently developed by the Service, should provide the Team with the template needed to develop and implement a plan of action for management of ravens.

Over the past five decades, the raven population in the western United States has experienced a 2.5% annual increase. This increase is attributed in part to the ability of ravens to benefit from increased anthropogenic changes to the landscape, such as increased availability and access to food, water, and nesting substrates. Ravens now negatively impact several species of imperiled wildlife through direct predation and are considered a threat to the health and safety of both humans and livestock in some places. Raven conflicts need to be addressed in a timely manner and this letter asks the Service to consider all management tools available, while working through the Species Conflict Framework.

Adoption
Pacific Flyway Nongame Technical Committee
August 21, 2019

[Signature]
Neil Clipperton, Chair

Adoption
Pacific Flyway Council
August 23, 2019

[Signature]
Kevin Blakely, Chair
August 23, 2019

Mr. Jerome Ford, Assistant Director
Migratory Bird Program
United States Department of Interior
Fish and Wildlife Service
Washington D.C. 20240

Re: Raven Core Team Progress

Dear Mr. Ford:

The Pacific Flyway Council (Council) comprises the fish and wildlife agencies of 11 western states responsible for science-based management and conservation of migratory birds in western North America. The Council works in association with federal agencies and other cooperators in the United States, Canada, and Mexico.

In 2018, the U.S. Fish and Wildlife Service (Service) asked the Pacific Flyway Nongame Technical Committee to participate in the Raven Core Team (Team) to work through the Species Conflict Framework. The Council supports the framework as a process to identify and implement management solutions. Work by the Team is extremely important given the growth of common raven (Corvus corax, ‘raven’) populations across the west. At present densities, ravens are negatively impacting several species of imperiled wildlife through direct predation. Council believes that raven conflicts need to be addressed in a timely manner and asks the Service to consider all management tools available, while working through the Species Conflict Framework. The Council asks that the Service expedite the work of the Team and requests a management decision timeline.

The raven, protected under the Migratory Bird Treaty Act of 1918, is an adaptable species that is very successful at utilizing local resources across a broad spectrum of habitats. Ravens have benefited from anthropogenic changes that have occurred throughout much of the western United States and Canada, such as increased availability and access to food, water, and nesting substrates. Breeding Bird Survey (BBS) results (Figure 1) from the western BBS survey region (Figure 2) illustrate a 2.5% increase per year in raven abundance in the west over the past five decades (Sauer et al. 2017). Figure 3 illustrates the annual change geographically in raven abundance documented by the BBS (Hudson et al. 2017, Link et al. 2017). Increased human development in the form of urbanization, industrialization, transportation corridors, and energy transmission corridors have all contributed to ravens becoming well established throughout the western United States and Canada.
Figure 1. Common raven annual Breeding Bird Survey index for 1967-2015 in the western survey region of the United States and Canada.

Figure 2. Breeding Bird Survey regions in the United States and Canada.
Ravens negatively impact several species of imperiled wildlife through direct predation. They have been documented to be among the most important nest predators on western snowy plovers (*Charadrius nivosus nivosus*) and California least terns (*Sterna antillarum*) at several locations in California (Powell and Collier 2000, Liebezeit and George 2002). They have also been documented preying on the eggs or young of several other threatened or endangered species including California condor (*Gymnogyps californianus*; Liebezeit and George 2002) and Mohave desert tortoise (*Gopherus agassizii*; USFWS 2008).

Predation by ravens has contributed to low nest success in some greater sage-grouse (*Centrocercus urophasianus*, ‘sage-grouse’) populations. Coates et al. (2008) and Lockyer et al. (2013) reported ravens as the primary predator of sage-grouse nests in some areas. Coates and Delehanty (2010), Dinkins et al. (2016), and Peebles et al. (2017) reported raven predation on sage-grouse nests negatively affected sage-grouse population growth.

Raven conflict involving protection of sensitive species, the health and safety of humans, agriculture, and livestock has resulted in ravens being taken under Service permits. For example, from 2011 to 2017 between 4,654 and 8,911 ravens were taken per year under Service depredation permits within Pacific Flyway states.

Figure 3. Percentages of change in raven relative abundance documented by Breeding Bird Surveys in the United States and Canada 1966-2015.
If the raven population continues to increase at its current trajectory, the results will likely include greater impacts on the species and habitats they currently influence. The Council endorses the Species Conflict Framework process developed by the Team to work through raven management decisions with stakeholder engagement, and we request a management decision timeline.

Sincerely,

Kevin Blakely,
Chair, Pacific Flyway Council

Literature Cited


Recommendation 19 – Letter to Secretary Bernhardt Regarding the Delays in the Rule-making Process for the Issuance of Annual Regulations for the Hunting of Migratory Birds

Recommendation
The Pacific Flyway Council (Council) approves sending the attached letter to the Secretary of the Interior, David L. Bernhardt addressing the need to adhere to the U.S. Fish and Wildlife Service published schedule for the issuance of annual migratory bird hunting regulations.

Justification
Since the new rule-making process was implemented in 2016, the published schedule has largely been unmet, putting the states in jeopardy of violating their own rule-making processes.

Adoption
Pacific Flyway Study Committee
August 21, 2019

Brandon Reishus, Chair

Adoption
Pacific Flyway Council
August 23, 2019

Kevin Blakely, Chair
August 30, 2019

Secretary David Bernhardt  
U.S. Department of the Interior  
1849 C Street, N.W.  
Washington DC 20240

Subject: Rule-making Process for Migratory Game Bird Hunting Seasons

Dear Secretary Bernhardt:

The Flyway Council system was developed to allow the states, who have an inherent interest in the conservation of migratory birds, to collaborate with the U.S. Fish and Wildlife Service (Service) to manage this shared resource using the best available science. This state and federal collaboration is one of the most successful efforts in wildlife management.

The Service, in cooperation with the states, developed a new approach in the issuance of the annual migratory game bird hunting regulations (SEIS 2013) to fulfill public input requirements and reduce inefficiencies so the regulations would be established months in advance of hunting seasons. We believed that the streamlined process would result in timely publication of federal regulations according to the rule-making schedule detailed in the Federal Register each year since 2016.

Unfortunately, these efficiencies have not been realized and the published schedule in the Federal Register is not being met (Table 1). For example, the proposed hunting season frameworks are scheduled to publish in early December but have been published as late as April. Final hunting season frameworks are scheduled to publish in late February but were not published this year until 10 business days before the 2019/20 hunting season. Publication of the state season selections, which concludes the annual rule-making process and allows seasons to be opened, were not published until August 28; three business days prior to the 2019/20 hunting seasons. Also, federal regulations have published later each year since 2016 when the Service adopted the intended more efficient and streamlined process.

Table 1. Comparison of target versus actual Federal Register publication dates since 2016 in the annual rule making process for migratory bird hunting regulations.

<table>
<thead>
<tr>
<th>Year</th>
<th>Proposed Federal Register Schedule</th>
<th>Actual Federal Register Publication Date</th>
<th>Days Behind Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>10-Dec</td>
<td>25-Feb</td>
<td>1-Jun</td>
</tr>
<tr>
<td>2018</td>
<td>10-Dec</td>
<td>25-Feb</td>
<td>1-Jun</td>
</tr>
</tbody>
</table>
The inability to meet federal rule-making requirements creates a liability for the states such as adopting state regulations before final Service regulation frameworks are published and printing of state hunting regulation booklets before season selections are finalized in the Federal Register. Currently the states are forced to move forward in their respective rule-making processes prior to the conclusion of the federal rule-making process. This may invite litigation at both the state and federal level, further jeopardizing our ability to provide hunting opportunities.

While we appreciate that final frameworks and season selections were recently published, prior to the expected start of the 2019/20 hunting season, we remain concerned about the publication schedule for future seasons. Currently, the preliminary proposed rule that opens the regulation process for the 2020/21 hunting season has yet to be published in the Federal Register, though it was scheduled to publish in April 2019. We ask that publication of the federal rule-making documents for migratory bird hunting seasons adhere to the rule-making schedule as stated in the Federal Register.

Sincerely,

Kevin Blakely,
Chair, Pacific Flyway Council

Cc: Margaret Everson, Principal Deputy Director, U.S. Fish and Wildlife Service
    Ron Regan, Association of Fish & Wildlife Agencies
    Rob Hossler, Chair, Atlantic Flyway Council
    Jason Sumners, Chair, Mississippi Flyway Council
    Jeb Williams, Chair, Central Flyway Council
    Pacific Flyway Council Members
Recommendation 20 – Funding to Support Double-crested Cormorant Surveys

**Recommendation**
The Pacific Flyway Council recommends sending the attached letter to the U.S. Fish and Wildlife Service (Service) requesting financial support for the 2020 surveys of double-crested cormorants in western North America.

**Justification**
Pacific Flyway states and partners have contributed to an ongoing survey of double-crested cormorants across the flyway since 2014. Designed and implemented by the Pacific Flyway Council, the survey is fundamental for developing effective management recommendations, and for guiding and assessing management actions pertaining to cormorant depredation on fish resources.

To meet monitoring objectives, the survey strategy relies on extensive collaboration among state, federal, and other partners. National wildlife refuges have played a vital role in this monitoring program, and we ask that this crucial support continue. Anticipated costs for surveys scheduled for 2020 is an estimated $145,750, of which $58,500 is not currently covered. Much of the uncovered survey cost is associated with national wildlife refuges (see the attached list of refuges). The letter to the Service requests funding for these surveys in 2020.

**Adoption**
Pacific Flyway Nongame Technical Committee
August 21, 2019

[Signature]
Neil Clipperton, Chair

Contact: Joe Buchanan

**Adoption**
Pacific Flyway Council
August 23, 2019

[Signature]
Kevin Blakely, Chair
Attachment 1. 2020 Western Population of Double-crested Cormorants within the Pacific Flyway Monitoring Sites on National Wildlife Refuges.

<table>
<thead>
<tr>
<th>State</th>
<th>Area</th>
<th>Colony</th>
<th>National Wildlife Refuge</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA</td>
<td>Central Coast – Outer Coast North</td>
<td>South Farallon Islands</td>
<td>San Francisco Bay National Wildlife Refuge Complex</td>
</tr>
<tr>
<td>CA</td>
<td>Central Coast – San Francisco Bay</td>
<td>Alviso Plant, Pond Nos. A9 &amp; A10</td>
<td>San Francisco Bay National Wildlife Refuge Complex</td>
</tr>
<tr>
<td>CA</td>
<td>Central Coast – San Francisco Bay</td>
<td>Bair Island Power Towers (incl. Steinberger Slough)</td>
<td>San Francisco Bay National Wildlife Refuge Complex</td>
</tr>
<tr>
<td>CA</td>
<td>Northern Coast – North Section</td>
<td>Arcata Bay Sand Islands</td>
<td>Humboldt Bay NWR</td>
</tr>
<tr>
<td>CA</td>
<td>Interior</td>
<td>San Joaquin River, SLNWR_1</td>
<td>San Luis National Wildlife Refuge Complex</td>
</tr>
<tr>
<td>MT</td>
<td>East of Cont Div</td>
<td>Arod Lake</td>
<td>Benton Lake National Wildlife Refuge Complex</td>
</tr>
<tr>
<td>OR</td>
<td>Central Coast</td>
<td>Parrot Rock</td>
<td>Oregon Coast National Wildlife Refuge Complex</td>
</tr>
<tr>
<td>OR</td>
<td>Northern Coast</td>
<td>Unnamed Colony (Cape Lookout)</td>
<td>Oregon Coast National Wildlife Refuge Complex</td>
</tr>
<tr>
<td>OR</td>
<td>Southern Coast</td>
<td>Hunters Island</td>
<td>Oregon Coast National Wildlife Refuge Complex</td>
</tr>
<tr>
<td>OR</td>
<td>Southern Coast</td>
<td>Unnamed Colony (Mack Reef)</td>
<td>Oregon Coast National Wildlife Refuge Complex</td>
</tr>
<tr>
<td>OR</td>
<td>Southern Coast</td>
<td>Unnamed Colony (N of Ferry Road Park)</td>
<td>Oregon Coast National Wildlife Refuge Complex</td>
</tr>
<tr>
<td>OR</td>
<td>Southern Coast</td>
<td>Unnamed Colony (Unnamed Rock)</td>
<td>Oregon Coast National Wildlife Refuge Complex</td>
</tr>
<tr>
<td>UT</td>
<td>Great Salt Lake</td>
<td>Great Salt Lake</td>
<td>Includes sites in Bear River Migratory Bird Refuge</td>
</tr>
<tr>
<td>WA</td>
<td>San Juan Islands</td>
<td>Bird Rocks</td>
<td>Washington Maritime National Wildlife Refuge Complex</td>
</tr>
<tr>
<td>WA</td>
<td>Interior</td>
<td>Lower Turnbull Slough</td>
<td>Turnbull National Wildlife Refuge</td>
</tr>
<tr>
<td>WA</td>
<td>San Juan Islands</td>
<td>Little Sister Island</td>
<td>Washington Maritime NWRC</td>
</tr>
</tbody>
</table>
23 August 2019

Robyn Thorson  
Regional Director  
U.S. Fish and Wildlife Service  
Pacific Region  
911 NE 11th Ave.  
Portland, Oregon 97232

Paul Souza  
Regional Director  
U.S. Fish and Wildlife Service  
Pacific Southwest Region  
2800 Cottage Way  
Sacramento, California 95825

Noreen Walsh  
Regional Director  
U.S. Fish and Wildlife Service  
Mountain-Prairie Region  
134 Union Blvd.  
Lakewood, Colorado 80228

Re: Request Support for 2020 Double-crested Cormorant Survey

Dear Regional Directors Thorson, Souza and Walsh:

Pacific Flyway states, the U.S. Fish and Wildlife Service (Service), and other partners have contributed to an ongoing survey of double-crested cormorants across the flyway since 2014. The survey was designed and implemented by the Pacific Flyway Council (Pacific Flyway Council 2013) and is fundamental for developing effective management recommendations, and for guiding and assessing management actions pertaining to cormorant predation on fish resources. Specifically, the Service requires these data to inform their permitting decisions. The western population is surveyed at three-year intervals from 2014 until at least 2023 (2014, 2017, 2020, 2023, etc.), and provides robust abundance estimates of double-crested cormorants across the flyway.

To meet its monitoring objectives, the survey relies on extensive collaboration among state, federal, NGO, and other partners. Within the Service, national wildlife refuges, the Inventory and Monitoring Program, and the Migratory Bird Management Program have played vital roles in past surveys. We are grateful for this collaboration. The Pacific Flyway Council’s Nongame Technical Committee is planning the 2020 survey, and the expected flyway-wide survey budget is an estimated $145,750, which includes an estimated $58,500 in uncovered survey costs. We appreciate the staff and funding commitments that have already been made from many national
wildlife refuges, the Inventory and Monitoring Program, and the Migratory Bird Management Program to complete the 2020 survey; this has greatly assisted in implementation planning. However, there is an additional need of funds.

With this letter, the Pacific Flyway Council requests affirmation that each Service region within the Pacific Flyway continue to provide ongoing support and requests additional funding commitments to address uncovered costs for surveys of double-crested cormorants across the western United States in 2020. Council would appreciate a report on the level of funding commitment provided by each region.

The Pacific Flyway Council is committed to addressing management issues across the flyway, and we look forward to continuing our strong working relationship with the Service.

Sincerely,

Kevin Blakely,
Chair, Pacific Flyway Council

Literature Cited
Recommendation 21 – Support for 2020 Double-crested Cormorant Surveys

Recommendation
The Pacific Flyway Council (Council) approves funding of up to $58,500 to support the 2020 Pacific Flyway Double-crested Cormorant Survey.

Justification
In March 2013, the Pacific Flyway Council approved and adopted A Monitoring Strategy for the Western Population of Double-crested Cormorants within the Pacific Flyway (Pacific Flyway Council 2013). Monitoring for double-crested cormorants began in 2014 and is scheduled to occur every third year (i.e., 2014, 2017, 2020, 2023) thereafter for at least 10 years to meet the monitoring objective. All selected colonies must be surveyed in order to meet the monitoring objective established in the monitoring strategy. States are responsible for: (1) survey coordination; (2) assimilation of data; (3) reporting information back to the Pacific Flyway Nongame Technical Committee and the Council; and (4) sharing data with the U.S. Fish and Wildlife Service (Service), who will manage and maintain the database.

As Council was notified in March of 2019 (Information Note 6), double-crested cormorant surveys in 2020 will consist of monitoring 48 colonies throughout eight states and one province. Estimated total cost to implement the double-crested cormorant monitoring strategy in 2020 is $145,750; some of which is covered under ongoing monitoring efforts. Estimated uncovered costs in 2020 are $58,500 as summarized in the table below. However, the Council has requested additional funding from the Service to cover some of these costs.

<table>
<thead>
<tr>
<th>State/Province</th>
<th>Total Number of Colony Complexes</th>
<th>Estimated Cost Covered Under Existing Programs (state/province contribution)</th>
<th>Estimated Uncovered Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>British Columbia</td>
<td>4</td>
<td>$4,000 ($1,500)</td>
<td>$2,500</td>
</tr>
<tr>
<td>California</td>
<td>16</td>
<td>$3,000 ($2,000)</td>
<td>$47,000</td>
</tr>
<tr>
<td>Idaho</td>
<td>3</td>
<td>$2,000 ($1,100)</td>
<td>$0</td>
</tr>
<tr>
<td>Montana</td>
<td>1</td>
<td>$1,000 ($0)</td>
<td>$0</td>
</tr>
<tr>
<td>Nevada</td>
<td>1</td>
<td>$1,000 ($1,000)</td>
<td>$0</td>
</tr>
<tr>
<td>Oregon</td>
<td>15</td>
<td>$32,000 ($5,000)</td>
<td>$3,500</td>
</tr>
<tr>
<td>Utah</td>
<td>1</td>
<td>$2,750 ($2,750)</td>
<td>$0</td>
</tr>
<tr>
<td>Washington</td>
<td>6</td>
<td>$20,000 ($0)</td>
<td>$5,500</td>
</tr>
<tr>
<td>Wyoming</td>
<td>1</td>
<td>$1,500 ($0)</td>
<td>$0</td>
</tr>
<tr>
<td>Data Compilation, Analysis, Report, Project Coordination</td>
<td></td>
<td></td>
<td>$20,000 ($0)</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>$87,250 ($13,350)</td>
<td>$58,500</td>
</tr>
</tbody>
</table>
Adoption
Pacific Flyway Nongame Technical Committee
August 21, 2019

Contact: Joe Buchanan

Neil Clipperton, Chair

Tabled – no further action
Pacific Flyway Council
August 23, 2019
Recommendation 22 – Amendment to the 2019 Budget

Recommendation
The Pacific Flyway Council (Council) amends the 2019 budget to add three line items. Two line items support the Nongame Technical Committee (NTC) Western Bird Conservation Partners Meeting December 10–11, 2019, in San Diego, California, and one line item supports representation at the Northern Pintail Harvest Strategy Working Group November 12-14, 2019, in Minneapolis, MN. The new line items will be added to the budget as follows:

1. A travel support line item for $2,000 under Section F. One-Time or Time-Limited Special Projects. Funds will support attendance by Mexican representatives Osvel Hinojosa Huerta, Pronatura Noroeste, and Eduardo Palacios, CICESE Department of Conservation Biology.
2. A Partners Meeting Support line item for $1,500 under Section F. One-Time or Time-Limited Special Projects. Funds will help cover costs of the venue.
3. Northern Pintail Harvest Strategy Working Group line item for $2,400 under Section F. One-Time or Time-Limited Special Projects. Funds will support attendance for two Study Committee members.

Justification
In March 2019, Council was notified of the NTC’s plans for hosting a Western Bird Conservation Partners Meeting in 2019 (Informational Note 8). The NTC has since formed a planning committee, selected meeting dates, secured a venue, and invited meeting attendees (Attachment 1). Partner representation from Mexico will enable a direct and meaningful discussion of full life-cycle conservation for migratory birds. We anticipate that at least two participants will require travel support funds. An additional $1,500 will keep registration fees low for meeting participants.

Council supports a review and revision of the Northern Pintail Harvest Strategy. In 2018, the National Pintail Working Group was reformed; Brandon Reishus (OR) and Melanie Weaver (CA) represent the Pacific Flyway. This group has met several times via conference call and is planning an in-person meeting for November 2019 in Minneapolis, Minnesota to make progress towards a review and revision of the harvest strategy. Funds will support travel costs for Pacific Flyway representation at the meeting.
Adoption
Pacific Flyway Study Committee
August 21, 2019
Contact: Jeff Knetter
Brandon Reishus, Chair

Adoption
Pacific Flyway Nongame Technical Committee
August 21, 2019
Contact: Jeff Knetter
Neil Clipperton, Chair

Adoption
Pacific Flyway Council
August 23, 2019
Contact: Jeff Knetter
Kevin Blakely, Chair
Recommendation 23 – 2020 Budget

Recommendation
The Pacific Flyway Council (Council) adopts the attached budget authorizing Council expenditures in calendar year 2020.

Justification
The Study Committee and Nongame Technical Committee are charged with preparing a calendar year budget for Council consideration. The budget includes administrative expenses, travel expenses for Flyway representation, and special project expenses.

The proposed 2020 budget includes $85,090 in anticipated expenses. Expected income of $110,890 includes $49,500 from member assessments (11 states; $4,500 each), $6,390 from NABCI assessments (9 states, excluding Colorado and Wyoming; $710 each), $20,000 from Banks Island banding assessments (8 states, excluding Colorado, Montana, and Wyoming; $2,500 each), and a $35,000 estimated carryover from calendar year 2019.

Since 2013, member assessments of $4,500 have provided a base budget. This budget recommendation does not require an increase in the base assessment in 2020.

Changes to the 2020 budget from 2019 include: $2,400 to provide travel support for Nongame Technical Committee representation at Bird and Fish Conflicts Working Group meetings.

Adoption
Pacific Flyway Study Committee
August 21, 2019

Brandon Reishus, Chair

Contact: Jeff Knetter

Adoption
Pacific Flyway Nongame Technical Committee
August 21, 2019

Neil Clipperton, Chair

Contact: Jeff Knetter

Adoption
Pacific Flyway Council
August 23, 2019

Kevin Blakely, Chair
## Attached 1. Proposed 2020 Pacific Flyway Council Budget

### Pacific Flyway Council Budget - Calendar Year 2020

<table>
<thead>
<tr>
<th>Function</th>
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<th>Notes</th>
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Pacific Flyway Council assessments to the 11 member states are based on projected expenses for flyway representation in Sections A - C, plus costs of operational PF-sponsored duck and crane surveys and duck banding in Section D and administrative costs in Section E. This provides for base budgeting at $49,500 per year (11 states @ $4,500).

**CY 2020 NOTES:**

1. NFC assessment of all flyways for Secretary travel and other expenses.
2. PF-sponsored surveys and banding included in base budget and assessment assumptions.
3. No expenses are budgeted for facilities and services for regular meetings; costs recovered in registration fees.

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Recommendation 24 – Letter of Appreciation to Dr. James Sedinger

**Recommendation**
The Pacific Flyway Council approves sending the attached letter to Dr. James Sedinger, retiring research biologist and professor of waterfowl ecology, in appreciation for his years of service.

**Justification**
See the attached letter.

**Adoption**
Pacific Flyway Study Committee
August 21, 2019
Brandon Reishus, Chair

Contact: Melanie Weaver

**Adoption**
Pacific Flyway Council
August 23, 2019
Kevin Blakely, Chair
August 23, 2019

Department of Natural Resources and Environmental Science
University of Nevada/Mail Stop 186
1664 North Virginia Street
Reno, Nevada 89557

Dear Dr. Sedinger:

The Pacific Flyway Council, as an organization representing the wildlife agencies of the eleven western states, would like to recognize your valuable contributions to the conservation and management of Pacific Flyway waterfowl over the course of your 30+ year long career. The Pacific Flyway Study Committee and Council have been very fortunate to benefit from your scientific expertise, including the preparation of over 100 peer-reviewed publications, as well as advice and counsel on a wide range of management issues.

From the Pacific Flyway perspective, you have made significant contributions through your (1) strong interest and dedication in solving management problems as evidenced by your extensive research into the ecology and population dynamics of Pacific brant and the scientific underpinnings of continental duck management, (2) leadership in organizing and contributing to workshops, national conferences and symposia to enhance wildlife science, and (3) positing challenges and questions of conventional wisdom and contemporary assumptions necessary to guide effective harvest and population management.

Your long-term brant colony monitoring at the Yukon-Kuskokwim Delta is exemplary of progressive and adaptive research built upon long-term datasets that have produced a comprehensive body of ecological and demographic findings. This unique prolonged endeavor also has left a continuing legacy of students and biologists that have benefited from your guidance and the cumulative wisdom of the program.

Your commitment to the conservation of waterfowl has strengthened the basis for our management programs in the Pacific Flyway. We have enjoyed your collegial manner and wit in discussing waterfowl science with you and hope you will continue to provide timely and sage advice as permitted in retirement. The Council wishes you the best in your future endeavors.

Sincerely,

Kevin Blakely,
Chair, Pacific Flyway Council
Recommendation 25 – Letter of Appreciation to Nate Huck

**Recommendation**
The Pacific Flyway Council approves sending the attached letter of appreciation to Nate Huck, Study Committee member from Wyoming.

**Justification**
See the attached letter.

**Adoption**
Pacific Flyway Study Committee
August 21, 2019

Brandon Reishus, Chair

Contact: Brandon Reishus

**Adoption**
Pacific Flyway Council
August 23, 2019

Kevin Blakely, Chair
August 23, 2019

Wyoming Game and Fish Department
Casper Regional Office
3030 Energy Lane
Casper, WY 82604

Dear Nate:

The Pacific Flyway Council would like to recognize and thank you for your contributions to the Pacific Flyway Study Committee and conservation and management of Pacific Flyway migratory game bird resources over the last two years. Although your time with the Study Committee was short, we have benefited greatly from your thoughtful contributions and your comradery. You provided a unique and insightful perspective, given your additional role as a member of the Central Flyway Waterfowl Technical Committee.

You came to the Pacific Flyway with a strong and clear understanding of our activities and issues, and served as the Wyoming technical representative in both the Pacific and Central flyways. This is no easy task and we commend you for the job you have done representing Wyoming in both flyways and for fully engaging with the Pacific Flyway.

Council wishes you the best as you begin your new career with the Pennsylvania Game Commission.

Sincerely,

Kevin Blakely,
Chair, Pacific Flyway Council
Informational Notes
Informational Note 1 – Raven Core Team Update

In September 2018, the Pacific Flyway Council (Council) approved and adopted Recommendation 21 – Pacific Flyway Council’s Representative to the Raven Conflict Work Group. The recommendation was to nominate Nevada’s Nongame Technical Committee (NTC) representative (currently Joe Barnes) to represent the Pacific Flyway on the U.S. Fish and Service’s (Service) Raven Core Team.

Common raven (Corvus corax; hereafter raven) populations have increased in the western United States and parts of Alaska since the 1970s, largely resulting from anthropogenic changes to the landscape, such as increased availability and access to food, water, and nesting substrates. Ravens sometimes prey upon and negatively affect imperiled species, such as the Mohave desert tortoise (Gopherus agassizii) and greater sage-grouse (Centrocercus urophasianus). Their nests on power lines and associated infrastructure cause outages, with consequences to human health and safety. Additionally, ravens can cause damage to agriculture and ranching operations.

Using the Species Conflict Framework, the Service’s Migratory Bird Leadership Team has determined that ravens are associated with conflicts affecting multiple resources in the western United States and that the process outlined in the framework should be applied to reduce those conflicts. The goal of the Core Team is to establish an appropriate sovereign/stakeholder engagement process, develop and evaluate management options, conduct a biological assessment if necessary, implement a management strategy, and evaluate the effectiveness of the management strategy.

Core Team Activity since September 2018

The October 2018 meeting was attended by the Service, Department of Defense, and the Pacific Flyway Council representative (Cris Tomlinson). Objectives of the meeting were to prepare a draft Charter and to identify and compile information to document and define issues. The NTC was subsequently distributed a link to comment on the draft Charter.

The March 2019 meeting was attended by the Service, USGS, DoD, USDA Wildlife Services, and the Pacific Flyway Council representative (Joe Barnes). The meeting purpose was to finish the draft Charter for Service management approval, discuss an outreach plan including technical documents, and identify targets for the outreach. Two groups for outreach were identified: sovereigns (States and Tribal Sovereign Nations), and other stakeholders.

The Service lead is synthesizing literature and other resources provided by Core Team members in a draft technical document for outreach targeted to sovereigns and other stakeholders, in preparation for joint late summer 2019 Core Team meetings (21 and 27 August). This document will help the Core Team collectively understand and articulate raven conflicts to inform an appropriate stakeholder process, as outlined in the Species Conflict Framework. To that end, the document will summarize the biology and ecology of ravens, cultural significance to Tribes,
historical management approaches to raven conflicts, information on the effectiveness of those approaches, current conflicts, and any information and assistance the Core Team is looking for from stakeholders.

**Adoption**
Pacific Flyway Nongame Technical Committee
August 21, 2019

[Signature]

Neil Clipperton, Chair
Informational Note 2 – Southern Wings Projects Report

In September 2018 and March 2019, the Pacific Flyway Council (Council) requested the Nongame Technical Committee and the Study Committee:

1. Identify which state’s Species of Greatest Conservation Need are addressed within each Southern Wings project.
2. Provide a Project Status Report for each of the three projects chosen as priorities by Council.

The attached Southern Wings Projects Report for the Pacific Flyway Council - 2019 fulfills both requests. In addition, through voluntary assessments, Pacific Flyway states contributed $2,000 toward the Southern Wings Pacific Flyway Shorebird Survey.

Both Committees are reviewing the Southern Wings Project Proposals 2019-2020, and a recommendation for three priority projects will be brought forward to Council in March 2020.

Adoption
Pacific Flyway Study Committee

August 21, 2019

Brandon Reishus, Chair

Adoption
Pacific Flyway Nongame Technical Committee

August 21, 2019

Neil Clipperton, Chair
The Pacific Flyway Shorebird Survey: Identifying Threats and Conservation Hotspots in Northwest Mexico

**Partners:** Terra Peninsular, Centro de Investigación Científica y de Educación Superior de Ensenada (CICESE), Point Blue Conservation Science, Universidad Nacional Autónoma de México (UNAM), Centro de Investigaciones Biológicas del Noroeste (CIBNOR), Universidad Autónoma de Baja California Sur (UABCS), US Forest Service International Program (USFSIP), Grupo Aves del Noroeste De México (GANO)

**States and organizations that have participated to date:** Arizona, California (new for 2019), Pacific Flyway Council (new for 2019).

Since 2017 Southern Wings contributions to projects have totaled $25,000.

**Overview:** Nearctic-neotropical migratory shorebirds (Order: Charadriiformes; Families: Charadriidae, Recurvirostridae, Scolopacidae) are highly mobile animals that traverse thousands of kilometers across the Western Hemisphere bi-annually and are reliant upon a network of coastal and interior wetland ecosystems. The Pacific Coast of the Americas (Fig. 1) supports entire populations of neotropical migratory shorebird species during winter (November-February). Wetlands stretching from western Alaska to southern Chile are critical for the survival of these birds; including 12 Western Hemisphere Shorebird Reserve Network sites in NW Mexico. The health of these sites is critical to supporting shorebird populations during their annual migrations. Current research indicates populations of shorebirds are declining (Andres et al. 2012) but the causes of these changes are not well understood (Butler et al. 2004).

The lack of broad-scale coordinated monitoring for Pacific Flyway shorebirds has limited our ability to effectively manage their populations, particularly in light of the predictions of climate change, which will likely alter habitat conditions (e.g. sea-level rise, reduced wetlands due to drought). In 2011, in collaboration with the Copper River International Migratory Bird Initiative and >100 individual and organizational partners throughout the Pacific Flyway, we initiated the Pacific Flyway Shorebird Survey (PFSS) and then the Migratory Shorebird Project to fill gaps in Pacific Flyway population status, trends, to assess hypothesized threats to shorebirds, and identify priority conservation locations, respectively. Specifically, the objectives of the PFSS and then the Migratory Shorebird Project are to: (1) quantify spatial and temporal trends in distribution and abundance of shorebirds and other waterbirds both at the individual site level and across their wintering ranges; (2) provide science-based guidance for managers to inform actions and measure the response; (3) develop an “iterative learning” analytical framework to critically evaluate specific hypotheses about the factors influencing population changes and to identify...
priority wetlands; and (4) educate individuals, communities, and governments about the importance of their wetland resources and their connectivity with people, via shorebirds, throughout the Americas. These programs now collect standardized bird and habitat condition data on over 2.5 million non-breeding waterbirds from 12 countries annually.

**Threats:** The primary threats to shorebirds in the Pacific Flyway include 1) changes in habitat availability; 2) exposure to contaminants and pollutants; 3) human disturbance; 4) climate change; and 5) increasing predator populations. Human disturbance is thought to particularly be a problem in beach habitats (important for populations of threatened or endangered species such as the Snowy Plover and Red Knot), which get a lot of use by humans compared to intertidal mudflats and rocky areas commonly used by other shorebird species.

**Birds:** Shorebirds (Families: Charadriidae, Haematopodidae, Recurvirostridae, Scolopacidae); Waterfowl (Black Brant and ducks); Raptors; and Waterbirds (terns, egrets, etc). Please see Table 1 for a complete list of species.

The wetland habitats and sites used by shorebirds during the non-breeding season and monitored as part of this program are important for other migratory waterbirds. For example; all 13 sites of importance for wintering Black Brant in northwest Mexico are surveyed each year, and Brant as well as other waterfowl are counted as part of the PFSS.

**Project goal:** The overall goal is to improve the efficiency of conservation and management for coastal wetlands, shorebirds, waterbirds and waterfowl in Mexico through the integration of data and prioritization in decision-making. This will be achieved by conducting the following actions.

1. Complete annual non-breeding bird surveys at 21 sites across Mexico (Fig. 2) and compile these survey data in to the PFSS node of the Avian Knowledge Network (AKN). Data collected in the field includes the number of birds (shorebirds, waterbirds and waterfowl), measures of bird disturbance, and assessment of habitat condition. The number of avian predators (raptors) of shorebirds and other waterbirds are also recorded.

2. Expand survey efforts on sandy beaches to improve sampling for Snowy Plover, Red Knot, Willet, and Sanderling, and improve our understanding of human impacts which primarily occur on beaches.

3. Integrate survey data from new and existing sites, along with spatial data on the distribution of shorebird habitat across Mexico, into models to determine drivers of shorebird distribution and abundance, and the prevalence of different threats. Distribution models developed with these data for Pacific Flyway State Wildlife Action Plan focal species will be used to highlight priority areas for non-breeding shorebird conservation.
Southern Wings Successes in 2018:

Nonbreeding Surveys

- **Nonbreeding Shorebirds Monitoring:** During January-February of 2018 we completed the annual non-breeding midwinter shorebird surveys at 21 sites across northwest Mexico (Fig. 2). These sites included 243 sampling units that are surveyed by about 50 volunteers in northwest Mexico.

- **Expanding Shorebird Surveys:** We increased (by 70) the number of sampling units with sandy beaches so as to improve sampling for Sanderling and Snowy Plovers (SNPL) and be better able to understand human impacts, which are centered on beaches.

- **Pacific Brant Surveys:** We provided a technical report on Brant surveys in Mexico to the Pacific Flyway Study Committee for their annual meeting on February 27-March 3, 2018.

- **Snowy Plover Nonbreeding Surveys:** During January 2018 we coordinated with the SNPL winter window survey along the Pacific coast of the United States to conduct Nonbreeding SNPL surveys in five sites in northwest Mexico (Estero de Punta Banda, San Quintin, Laguna Atotonilco, Marismas Nacionales, and Ceuta). In March 2018 we conducted one nonbreeding survey at each site (and two surveys at Estero de Punta Banda).

- **Nonbreeding Waterbird Monitoring:** During January-February we completed non-breeding waterbird surveys of roosting birds at 10 sites located in Sinaloa, Sonora, Oaxaca and the Baja California peninsula.

Breeding Surveys

- **Breeding Monitoring:** During May and June 2018, breeding SNPL were monitored at six sites of northwest Mexico (Estero de Punta Banda and Bahía San Quintin, Baja California; Ensenada de La Paz, Baja California Sur; Laguna Atotonilco, Jalisco; Bahía Ceuta, Sinaloa; and Marismas Nacionales, Nayarit). These surveys were coordinated with the SNPL breeding window survey along the Pacific coast of United States. Wilson’s Plover have been monitored monthly in Ensenada de La Paz since March 2018.

- **Monitoring:** During June 2018 we conducted a range-wide survey of the endangered California Least Tern (LETE) colonies along the Pacific coast of the Baja California peninsula (Punta Banda and San Quintin).
**Education/Outreach/Training**

- **Outreach Talk:** On 2\textsuperscript{nd} February 2018, we celebrated the World Wetlands Day by guiding bird-watching walks at Estero de San José del Cabo, Baja California Sur. We also gave a talk about the importance of Ramsar sites for migratory waterbirds to college students.

- **Conference:** During the 45\textsuperscript{th} Annual Meeting of the Pacific Seabird Group we presented a paper on the current status of the LETE in the Baja California peninsula.

- **Training:** In early March 2018 we provided training to a group of interns from Environment for the Americas on identification and monitoring shorebirds. These interns will implement shorebird monitoring surveys at protected areas in the US.

- **Bird Festival:** From March 6-10, 2018, Terra Peninsular conducted several activities to celebrate the 2\textsuperscript{nd} Bird Festival of Bahía Todos Santos in Ensenada, Baja California.

- **Outreach Event:** We teamed up with other organizations to celebrate World Environment Day (June 5\textsuperscript{th}) and conducted an event called “The beach belongs to everyone”. See more information at: [http://terrapeninsular.org/crean-alianza-para-protector-avies-playeras-ensenada/](http://terrapeninsular.org/crean-alianza-para-protector-avies-playeras-ensenada/)

- **Training:** In May 2018, our two students Brenda Guzmán and Abril Heredia worked for a week with a team of other biologists from Washington Department of Fish and Wildlife (led by Joe Buchanan) to conduct capture and marking of Red Knots in Grays Harbor, WA.

**Conservation Planning**

- **Report on disturbance:** We completed a report that analyzed human disturbance in the sandy beach of Golfo de Santa Clara, a hemispheric WHSRN site, located in the Colorado River Delta. The site is very important for Red Knot spring migration in March through May, when they feed on grunion eggs at this site and overlap with Easter vacation and other holidays that generate a lot of disturbance to migrating shorebirds.

- **Training:** On May 12th, 2018 we had a one-day workshop on disturbance, in Ensenada with Comisión Nacional de Áreas Naturales Protegidas (CONANP) staff and volunteers from Golfo de Santa Clara, Sonora. We developed a protocol to monitor disturbance of waterbirds, and an index of disturbance. This protocol will be used by CONANP to mitigate human disturbance affecting migratory shorebirds in the Colorado River Delta.

**Data Entry**

- **Database:** In March - June 2018 we entered these survey data into the project’s online data entry portal hosted by California Avian Data Center (CADC), which is a node of the AKN. Data includes the number of shorebirds, waterbirds and waterfowl, measures of human disturbance and raptors, and assessment of habitat condition.
Specific Activities planned for 2019: Terra Peninsular and partners will implement the following conservation actions.

- Conduct standardized annual non-breeding bird surveys of 21 wetland sites across NW Mexico (Fig. 2), and compile these survey data into the AKN node. Data collected in the field includes the number of birds (shorebirds, waterbirds and waterfowl), measures of bird disturbance, and assessment of habitat condition. The number of avian predators (raptors) of shorebirds and other waterbirds are also recorded.

- Conduct monitoring of breeding SNPL at six sites across NW México (Estero de Punta Banda and Bahía San Quintín, Baja California; Ensenada de La Paz, Baja California Sur; Laguna Atotonilco, Jalisco; Bahía Ceuta, Sinaloa; and Marismas Nacionales, Nayarit). Breeding LETE colonies will also be monitored at two of these sites (Punta Banda and San Quintín).

- Protect nesting habitat (through perimeter fencing), and implement public outreach/education activities at two sites (Bahía San Quintín and Estero de Punta Banda) to mitigate the effects of human disturbance on breeding SNPL and LETE.

- Strengthen conservation and management of a designated wildlife conservation unit (UMA) in the San Quintin Bay area, in concert with several partners, including a local hunting organization:
  - Monitor wintering population of Pacific Brant and work to maintain/enhance habitat.
  - Assist in the voluntary designation of hunting and non-hunting units within the UMA.
  - Improve capture of harvest information (sex and age) for hunted Pacific Brant.
  - Conduct outreach on sustainable and responsible hunting practices.
  - Promote birding and wildlife photography tours.
  - Implement a beach cleanup campaign.

- Implement or support education/outreach and training activities such as, 1) the 5th Bird Festival of Bahía San Quintín, 2) outreach campaign “Share the Beach” focused on nesting SNPL and LETE, 3) other activities that disseminate conservation information to land managers, new professionals, and the general public.
**Budget:** Contributions of $5,000 to $10,000 each will significantly advance implementation of these shorebird/waterbirds/waterfowl conservation actions.

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<td>Conduct standardized annual non-breeding bird surveys of 21 wetland sites across NW Mexico</td>
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<td>Conduct monitoring of breeding shorebirds at six sites across NW Mexico</td>
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<tr>
<td>Monitor, protect nesting habitat, and implement public outreach for breeding SNPL and LETE at Bahía San Quintín and Estero de Punta Banda</td>
<td>10,500</td>
<td>1,000</td>
<td>500</td>
<td>6,000</td>
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<tr>
<td>Strengthen conservation and management of key areas</td>
<td>25,000</td>
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<td>Implement education/outreach and training activities</td>
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Figure 2. Location of 21 coastal wetland sites which are part of the Pacific Flyway Shorebird Survey in Northwest Mexico.
Table 1. Species of Greatest Conservation Need (SGCN) in the project area, listed by state.

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Protecting stopover and wintering habitat for key priority species of shorebirds and waterbirds at Latin America and the Caribbean

Partners: Pronatura Noreste (PNE), National Commission of Protected Areas (CONANP), Rio Grande Joint Venture (RGJV), Grupo Quetzalli, Manomet, New Jersey Audubon, Aquasis, Honduran Ornithological Society

States that have participated to date: Texas
To date Southern Wings contributions have totaled $10,500

Overview: Shorebird and waterbird species are experiencing serious population declines. For some we understand the biggest threats, but for many others we are still identifying important stopover and wintering sites, and developing conservation strategies. For example, the Reddish Egret Working Group has been active and is in the process of developing a hemispheric conservation strategy for this species. American Bird Conservancy (ABC) partner, PNE, led the development of a Reddish Egret Conservation Plan for Mexico that identified four priority regions for that country.

Based on the Reddish Egret Conservation Plan, as well as the Atlantic Shorebird Conservation Business Plan and the Pacific Flyway Shorebird Conservation Strategy, we are targeting Reddish Egret, Wilson’s Plover, Snowy Plover, Red Knot, Long-billed Curlew, and Piping Plover as high priority species. ABC has identified sites where conservation is most urgently needed.

- Laguna Madre, Mexico
- Gulf of Fonseca, Nicaragua and Honduras
- Maranhão, Brazil (Ilha Grande estuary and Delta do Parnaíba)

Other areas of interest include the Isthmus of Tehuantepec in Oaxaca, Mexico; the Gulf of Nicoya in Costa Rica; Panama Bay in Panama, the Surinam coast; and coastal and freshwater wetlands on multiple Caribbean islands in both the Greater and Lesser Antilles.

ABC is working with a diverse group of partners to identify a conservation strategy that will be appropriate and specific to each of the identified sites. For example, in Laguna Madre our partner PNE’s focus is on habitat restoration, biological monitoring, community engagement, and land protection. Laguna Madre specifically falls within the purview of the RGJV, and any conservation activities implemented through this proposal will help advance the RGJV’s conservation plan for this region. In Nicaragua, ABC has identified Grupo Quetzalli as a local organization working with shrimp farmers and women’s groups to educate them on bird conservation and reduce impact of shrimping on these species in the Gulf of Fonseca. In Brazil, ABC is working with Aquasis to address the management issues occurring at the Delta do Parnaíba Protected Area in the Ilha

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1 This project was previously titled Protecting stopover and wintering habitat for key priority species of shorebirds and waterbirds at Laguna Madre, Mexico. The project name has changed to reflect its broader geography.
Grande estuary. Here, shrimp farming and bivalve harvesting are resulting in habitat loss in important shorebird foraging locations.

**Threats:** The principal threats to shorebirds include shoreline and wetland modification, aquaculture, poor water management policies and enforcement, habitat disturbance from recreation activities and predators, invasive species, development, and climate change. In Laguna Madre drought is a serious issue and is reducing wetland habitat. The loss of mangroves in this ecosystem has led to increased erosion of barrier islands and is decreasing available resting and roosting habitat for migratory waterbirds. Furthermore, fishermen frequent barrier islands and leave dogs there that disturb and prey on birds. In the Gulf of Fonseca, shrimp farming is an important economic activity, but it has a high environmental impact. Plus, land and water use policies and enforcement are lacking. In Brazil, coastal areas in the northeast are rapidly being developed. Mangroves, intertidal salt flats, and lagoons are all being lost or being devastated by shrimp farming, bivalve harvesting, and salt harvesting operations.

**Birds:** The focal species (Table 1) include: Reddish Egret, Wilson’s Plover, Snowy Plover, Red Knot, Long-billed Curlew, and Piping Plover. Secondary focal species include: American Oystercatcher, Sanderling, Least Tern, Black Skimmer, Western Sandpiper, Semipalmated Sandpiper, and Redhead.

**Project goals:** Conservation planning with our partners has identified the following objectives.

- Improve management and conservation of existing habitats
- Cultivate and empower conservation constituencies
- Engage commercial industries impacting natural resources
- Strengthen compliance and enforcement of local laws
- Develop and improve environmental, water and wildlife policies
- Improve knowledge of current habitat use and threat status
- Increase partner and stakeholder capacity

**Activities:** In the 240,000-ha Laguna Madre, we will focus on the reforestation of mangroves, fencing of key areas to prevent predators from disturbing bird areas, and educating local constituencies. The loss of soil on many islands within Laguna Madre continues at an accelerated rate due to wave action causing erosion. One of the islands that has been significantly impacted is the Isla de Pajaros, or Bird Island, which is one of the most important sites for colonial waterbirds in Laguna Madre. PNE and CONANP are proposing the establishment of 600m of containment barriers on the south end of Bird Island.

In the Gulf of Fonseca, we will engage shrimp farmers to identify management practices to reduce impact on shorebirds and their habitat, while not seriously impacting their livelihood. We will advance educational programming in the area to reduce impacts on mangroves and of upstream farming.

In Brazil, we will develop recommendations for protected area management that we can present to the local environmental management council. Our goal is to promote better consideration of shorebirds into management planning for the Delta do Parnaíba Protected Area (DPPA). A second goal is to evaluate the threat of hunting at the DPPA and determine if the Brazilian Environmental
Ministry should be taking action to enforce hunting regulations here. Finally, we seek to address important information gaps on shorebird species diversity and seasonal abundance and to consolidate existing information and provide new information that will allow ABC, Aquasis, and other conservation partners to nominate specific parts of the DPPA for WHSRN site status.

**Previous Southern Wings Successes:** Southern Wings has been focused on Laguna Madre, Mexico. For 2013 and 2017, Southern Wings invested a total of $10,500 in the Laguna Madre project, funding mangrove reforestation that resulted in the planting of nearly 21,000 mangrove saplings over 75.6 acres. Previously, with funding from the National Fish and Wildlife Foundation, ABC, and PNE, two new conservation agreements were created on private lands totaling over 10,000 acres, a program was started to control feral animals on islands, fencing was improved to reduce cattle and other agricultural animals from entering sensitive areas of Laguna Madre, focal species monitoring was conducted, mangrove restoration was implemented, and key nesting and wintering sites were protected.

**Budget:** The total budget request for Laguna Madre is $36,500, for the Gulf of Fonseca is $10,000, and for the Delta do Parnaiba is $42,700. Smaller amounts of money can support specific activities. For more detailed budget information for the other sites please contact Deb Hahn (dhahn@fishwildlife.org).

<table>
<thead>
<tr>
<th>Conservation Activity (Laguna Madre)</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction and installation of containment barriers</td>
<td>$18,000</td>
</tr>
<tr>
<td>Conduct mangrove reforestation to reduce erosion on Isla de Pajaros</td>
<td>$5,000</td>
</tr>
<tr>
<td>Conduct annual bird monitoring program for additional data collection</td>
<td>$6,000</td>
</tr>
<tr>
<td>Boat rental and travel costs for avian monitoring and communication</td>
<td>$2,500</td>
</tr>
<tr>
<td>PNE Project Coordination and Administration</td>
<td>$5,000</td>
</tr>
<tr>
<td><strong>Laguna Madre Sub-total</strong></td>
<td><strong>$36,500</strong></td>
</tr>
</tbody>
</table>

**Matching Funds:** Partners at each site fundraise to provide support for the conservation activities. Funds come from private foundations as well as in-country government agencies and programs.
Map of Laguna Madre, México

Map Gulf of Fonseca
Table 1. Species of Greatest Conservation Need (SGCN) in the project area (Laguna Madre site), listed by state.

<table>
<thead>
<tr>
<th>Species (SGCN)</th>
<th>AK</th>
<th>AZ</th>
<th>CA</th>
<th>CO</th>
<th>ID</th>
<th>MT</th>
<th>NV</th>
<th>NM</th>
<th>OR</th>
<th>UT</th>
<th>WA</th>
<th>WY</th>
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</thead>
<tbody>
<tr>
<td>Long-billed curlew</td>
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<tr>
<td>Piping Plover</td>
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<tr>
<td>Least Tern</td>
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<td>Black Skimmer</td>
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<td>Western Sandpiper</td>
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<tr>
<td>Semipalmated Sandpiper</td>
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75
Conserving Wetlands in the Upper Pacific Coast of Mexico

**Partners:** Ducks Unlimited de México (DUMAC) and the University of Guadalajara

**States that have participated to date:** None (new project)

**Overview:** The mainland west coast of Mexico contains several important areas for waterfowl, shorebirds, and other waterbirds (Figure 1). These habitats consist of tidal estuaries connected with brackish water marshes and inland fresh water wetlands and reservoirs. Fresh water streams and irrigation water empty into tidal lagoons and create flats, tidal pools, mangrove swamps and emergent vegetation dominated by cattail, bulrush, wigeongrass, muskgrass and algae. The state of Sonora is encompassed by 1,200 km and more than 190,000 ha of coastal wetlands. Adjacent to the coast lie approximately 456,000 ha of irrigated agriculture.

Upland areas were converted to intensive agriculture during the last 30 to 40 years resulting in major changes to the local wetlands. They have become less saline and subjected to discharges of agricultural pesticides and fertilizers along the in-shore areas. They are more densely covered by cattails that thrive under the new environmental conditions. The cattails cause changes to the structure of the habitat and bird use of the wetlands.

Much of the irrigated farmland supported rice production after it was developed. Rice is very beneficial to waterfowl. However, over the years, agricultural subsidies to producers in wealthier countries have eliminated the economic viability of rice production in Mexico. As a result, production shifted to several other crops, and rice acreage has been eliminated or severely reduced. The loss of rice acreage is correlated with a drop in use of the region by waterfowl, including Northern Pintail. Nevertheless, the irrigation systems are still viable, so fresh water and agricultural chemicals continue to be introduced to the coastal marshes.

A new significant threat along the littoral habitat is the unregulated growth of the shrimp-farming industry. In Sonora the shrimp farm industry has grown to approximately 5,252 ha and it is clearly a major threat for the future as communities and speculators attempt to develop economic opportunities in these areas that were once considered to be wastelands. The damage by the shrimp industry is caused by the direct destruction of mangrove swamp habitat and, more importantly, by the major disruption of the natural hydrological patterns that sustain the whole
ecosystem. The hydrological modifications affect both the salinity of the wetlands and the availability of water needed to sustain them.

Wetlands along the coastal zone are threatened not only from the shrimp farm industry and agricultural activities, but also from road infrastructure that modifies the natural hydrology. These developments affect the hydroperiod of the coastal wetlands, destroying important coastal areas and leading to a reduction of habitat available for migratory birds. It is essential, we consider the restoration or enhancement of those intertidal zones whose hydrology has been modified by road infrastructure. There are roads crossing important coastal wetland areas whose infrastructure needs to be modified to allow the recovery of the natural flow that used to run through these areas—the natural flows served to create important areas for use by migratory waterfowl and other species.

**Project Goal:** We propose to implement a project to create Moist Soil Management Units (MSMU) on agricultural fields and restore the natural hydrology of an intertidal area to provide quality foraging habitat for migratory waterfowl, shorebirds, and other wading birds.

**Project Location:** The Moroncarit Lagoon complex in southern Sonora (Figure 2) is an area that has been recognized for its importance for the distribution of migratory and resident waterfowl and other waterbirds.

**Birds:** This lagoon complex is included in the Mexican Plan for the Conservation, Management and Rational Use of Waterfowl and their Habitats, and is also designated as an Important Bird Area. The area is on the list of new North American Waterfowl Management Plan (NAWMP) sites within the Pacific Coast region. The area is also designated as a Ramsar site, where “each year over 50,000 individuals of shorebirds visit the marshes, mud flats and mangroves of the Moroncarit lagoon, and it is also an important wintering site for 47,000 ducks, geese and other waterfowl” (Table 1). The lagoon area represents an historical wintering habitat of migratory waterfowl species such as the Blue-winged Teal (*Anas discors*), Pintail (*Anas acuta*), Northern Shoveler (*Anas clypeata*), Lesser Scaup (*Aythya affinis*), and American Wigeon (*Anas americana*). It also qualifies as a Regional Site within the Western Hemispheric Shorebird Reserve Network for the large numbers of shorebirds that winter there each year, such as Long-billed Curlew (*Numenius americanus*), Black-necked Stilt (*Himantopus mexicanus*), Sanderling (*Calidris alba*), Western Sandpiper (*Calidris mauri*), Short-billed Dowitcher (*Limnodromus griseus*), Marbled Godwit (*Limosa fedoa*), Whimbrel (*Numenius phaeopus*), American Oystercatcher (*Haematopus palliatus*) and Ruddy Turnstone (*Arenaria interpres*).

**Project Activities:** DUMAC proposes to implement the following conservation actions.
1. Restore 150.73 acres of wetland in the area; design a wetland management plan and construct a series of culverts along a road, which will allow the diversion of water from a drainage channel, to flood 150.73 acres of an intertidal area.
2. Create 212 acres of MSMUs in intertidal areas that have been modified by agriculture.
3. Establish a long-term conservation agreement (15-year agreement with renewal option) with the local Ejido (communal landowner) to ensure conservation of the areas.
4. Implement a "Teaching the Teachers" Environmental Education Program to improve teachers’ capacities to incorporate the environmental education components into their curriculum. At least 80 teachers from elementary and secondary schools will be trained (match activity).

We are proposing to develop a series of MSMU on agricultural fields, to produce a double benefit. The first will be the benefit of the first crop harvest for the local farmers and the second will be forage for wildlife, including waterfowl. Alternative habitat can be established through the creation or enhancement of natural depressions that used to be part of the intertidal coastal area. These natural depressions adjacent to the natural coastal lagoons had been converted to agricultural areas (and then laid fallow) can serve as traditional management units with the potential for the creation of high quality habitat for use by migratory waterfowl and other species. These created habitats serve to replace those natural habitats damaged by the expansion of agriculture and shrimp farms.

The natural depressions represent an important alternative habitat for migratory waterfowl and other species; especially since there is already significant infrastructure in these areas, with drainage channels that can be used to flood areas. Thus, with minimal infrastructure investments, this proposed restoration project would mitigate habitat loss and replace it with compensatory management units for migratory bird use.

Figure 2. General location of the Moroncarit Lagoon complex in Sonora, Mexico.
Project Task Timeline:
*Project timelines can be adjusted based on when funds would become available.

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer 2019</td>
<td>Develop a construction design based on a topographic survey and hydrology analysis for the intertidal wetlands restoration work. Begin negotiations with landowners to establish the MSMUs. Start talks with the Education Secretariat to present the Environmental Education Program and start the selection of participants.</td>
</tr>
<tr>
<td>Fall 2019</td>
<td>Monitoring of habitat and wintering waterfowl and shorebirds use to establish pre-project baseline status for the project area. Start construction work of the restoration area. Clearing of non wetland vegetation from MSMU areas. Carry out the first Teaching the Teachers Environmental Education workshop in local schools.</td>
</tr>
<tr>
<td>Winter 2019</td>
<td>Construction and management of MSMUs. Finish construction of culverts and dredging of channel at wetlands restoration area. Monitor post-restoration habitat conditions and wildlife use of project area. Continue with the environmental education workshops.</td>
</tr>
<tr>
<td>Spring 2020</td>
<td>Final report with information regarding the construction work and evaluation of the enhancement of habitat conditions of the project area.</td>
</tr>
</tbody>
</table>

**Project Budget:** Total estimated budget for the project is $121,385, and Southern Wings funds can support specific activities for 2019 with $17,000 to $4,000 per task:

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Total Cost</th>
<th>Southern Wings Request</th>
<th>DUMA C</th>
<th>University of Guadalajara</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design and engineering plans, including the topographic survey and the hydrology analysis.</td>
<td>14,932</td>
<td>3,632</td>
<td>11,300</td>
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<tr>
<td>Construction of culverts (2)</td>
<td>31,465</td>
<td>16,870</td>
<td>14,595</td>
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<tr>
<td>Dredging of channel (1674 yd. @ $3.77 per yd.)</td>
<td>6,318</td>
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<tr>
<td>Pre and post monitoring of habitat and wildlife use (5 years)</td>
<td>5,000</td>
<td>5,000</td>
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<tr>
<td>Construction/rehabilitation of infrastructure for MSMU</td>
<td>19,680</td>
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<tr>
<td>Agricultural equipment for soil preparation for MSMUs (212 acres @ $82.5 x acre)</td>
<td>17,500</td>
<td>13,180</td>
<td>4,320</td>
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<tr>
<td>Tasks</td>
<td>Total Cost</td>
<td>Southern Wings Request</td>
<td>DUMAC</td>
<td>University of Guadalajara</td>
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<tr>
<td>Flooding of MSMUs (212 acres @ $47.17 x acre)</td>
<td>10,000</td>
<td>5,000</td>
<td>5,000</td>
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<tr>
<td>Implement the “Teaching the Teachers” environmental education program (3 workshops @ $3,710 x workshop)</td>
<td>11,130</td>
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<tr>
<td>Printing of didactic material for teachers</td>
<td>5,360</td>
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<td><strong>TOTAL</strong></td>
<td><strong>121,385</strong></td>
<td><strong>50,000</strong></td>
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<tr>
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<tr>
<td>DUMAC</td>
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<td>66,385</td>
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<td>University of Guadalajara</td>
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<td>5,000</td>
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<tr>
<td><strong>TOTAL MATCH</strong></td>
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<td><strong>71,385</strong></td>
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</tbody>
</table>

If needed, costs may be transferred between line items, depending on final engineering plans, and costs associated with land preparation, infrastructure modifications, and monitoring and administration needs.
Table 1. Species of Greatest Conservation Need (SGCN) in the project area, listed by state.

<table>
<thead>
<tr>
<th>Species (SGCN)</th>
<th>AK</th>
<th>AZ</th>
<th>CA</th>
<th>ID</th>
<th>NV</th>
<th>OR</th>
<th>UT</th>
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Informational Note 3 – Pacific Flyway Nongame Technical Committee 2020 Work Plan

The Pacific Flyway Nongame Technical Committee updated its 2020 work plan to reflect new and completed efforts. Notable changes include:

1) Addition of Golden Eagle Allocation Process Refinement, Short-eared Owl Data Entry Protocol Refinement, Southern Wings Fund Allocation, Colonial Waterbird Data Entry Protocol Development, Yellow-billed Cuckoo Survey Implementation and Reporting, and representation on the USFWS Raven Core Team;

2) Removal of Golden Eagle Take Allocation Process Input, and Short-eared Owl Data Entry Protocol Development, as these items have been completed.

The updated work plan is attached.

Adoption
Pacific Flyway Nongame Technical Committee Contact: Colleen Moulton
August 21, 2019

Neil Clipperton, Chair
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Informational Note 4 – Update of the Bird and Fish Related Conflict Working Group

The Bird- and Fish-related Conflict Working Group (WG) is a nation-wide working group, established in March 2018, that includes about 20 members. The working group includes representatives from each of the flyways, and the representative for the Pacific Flyway is Joe Buchanan (Nongame Technical Committee).

The working group’s charge is as follows:

Federal and State Agency members representing the bird and fisheries management disciplines will develop an adaptive approach to identify opportunities for most efficiently addressing the challenges of managing piscivorous birds and affected fishery resources and promote a common understanding of their interactions. The WG reports to the Fisheries and Water Resource Policy Committee and the Bird Conservation Committee. The WG may advance issues to the FWRPC and BCC from which information and requests can be developed and presented to state directors.

The group has met four times; most recently in July 2019. The group has drafted and finalized focus areas and goals (described below), as well as identified action items associated with many of the focus areas and goals.

Focus Areas and Goals of the working group:

1. Develop best practices for constructively engaging bird and fisheries management disciplines within and among state and federal fish and wildlife agencies on issues surrounding the management of bird and fisheries resource related conflicts;
   a. Identify opportunities to establish and improve efficient and effective communication within and between state and federal agencies regarding management challenges surrounding piscivorous birds and fish.
   b. Evaluate current processes for stakeholder input, within the purview of the group, to enhance the public input process related to bird- and fish-related conflicts.
   c. Develop a common understanding of population goals for priority birds and fish and how those goals are established.

2. Develop science assessment and needs regarding impacts of bird predation on fisheries resources and priority fish populations;
   a. Prioritize list of piscivorous birds of concern and review population characteristics and trends.
b. Prioritize list of vulnerable fisheries resources and fisheries of concern by category, and, where possible, describe population characteristics and trends.

c. Develop recommendations for gathering and administering priority bird and fish population data.

d. Develop a common understanding of methodologies used to evaluate avian predation, including the strengths, costs, and limitations of different approaches.

e. Where appropriate, compile existing evaluations of biological, economic, and social impacts of avian predation and control.

f. Develop a classification system to categorize evaluations of avian predation impacts by level of scientific credibility (i.e., tiered system ranging from anecdotal observations to peer-reviewed literature).

g. Develop recommendations to establish the level (or combination of levels) of evaluations necessary to demonstrate with acceptable certainty; the biological, economic, and social impacts of avian predation.

3. Develop recommendations to conduct well-designed and defensible evaluations of avian predation impacts or benefits to fish population health.

4. Develop recommendations on how to manage avian predation on fisheries resources, as part of an adaptive process, while ensuring appropriate population levels of fish and birds.

In addition to items related to focus areas and goals, the group proposed a theme for a technical session at the annual meeting of The Wildlife Society, held jointly with the American Fisheries Society on 29 September – 3 October in Reno, Nevada. The proposed technical session was accepted and is included in the official conference program. There will be multiple presentations covering a broad scope of science and management issues relating to avian predation on fish resources.

Adoption
Pacific Flyway Nongame Technical Committee
August 21, 2019

Neil Clipperton, Chair
Informational Note 5 – 2020 Trumpeter Swan Survey Steering Committee Update

The North American Trumpeter Swan Survey (NATSS) is a cooperative, range-wide survey that has been conducted at five-year intervals since 1968 to monitor the status of trumpeter swans in North America. The survey is conducted by federal, state, provincial, and private cooperators across the northern U.S. and Canada. Survey results are used by the flyway councils, wildlife management agencies, and others to evaluate trumpeter swan status relative to various management and conservation objectives.

Since 1968, all three trumpeter swan populations have experienced tremendous growth and range expansion, which has resulted in an increase in the cost and logistical complexity of the NATSS. This growth has also led to changes to the conservation status for the species in many jurisdictions (i.e., ‘down-listing’). As a result, some cooperators are now challenged to find the resources (funding and staffing) necessary to carry out the survey. With a few exceptions, cooperators are responsible for their own funding and rely on survey methods that suit regional needs, budgets and goals. In 2012, a steering committee (Committee) was formed within the existing flyway structure to plan for the 2015 survey and help with international coordination of this complex survey (involving many cooperators over a large geographic area), but also to ensure the survey is as cost-effective and technically sound as possible.

The Committee was recently revitalized to plan for the next quinquennial survey in 2020. The Committee is composed of representatives from each flyway, the Canadian Wildlife Service (CWS), and The Trumpeter Swan Society. To date, the Committee has met twice via teleconference to plan for the 2020 survey. During those meetings, the Committee supported maintaining the 2015 survey objectives, methods, and coverage for the 2020 survey. The primary objectives of the survey are to obtain white swan abundance (adult and subadult), with a secondary objective to obtain summer range delineation, and an optional objective to obtain data on productivity (i.e., cygnet abundance, broods, brood size). The Committee also identified preliminary survey gaps and needs (e.g., financial, staffing).

The Committee also tasked itself with seeking input from the flyway councils and technical committees at the 2019 fall meetings to identify additional survey gaps and outstanding needs. The Committee can help to prioritize those needs across flyways and seek support to the extent possible. [The Pacific Flyway Study Committee (SC) indicated that no survey gaps or additional financial help was needed to complete the U.S. portion of the survey in the Pacific Flyway.]

Andre Breault (CWS) indicated that a review of this survey by the CWS’s Wildlife Monitoring and Assessment Committee recommended the complete CWS withdrawal from the 2020 NATSS. CWS plans to explore the use of other monitoring programs to track population abundance and trends (e.g., the Waterfowl Breeding Population and Habitat Survey, Christmas Bird Counts) in Canada.
The SC indicated that the lack of participation by CWS would represent a loss of important information from a significant portion of the survey that cannot be easily replaced, and the loss of these data would impact management programs. In the Pacific Flyway, Canadian data are used to derive the management index of two populations of trumpeter swans. This would directly impact tundra swan hunts in four western states (Alaska, Montana, Utah, and Nevada) and a proposed hunt in Idaho.

The absence of CWS survey effort would most importantly hamper the ability of the Pacific Flyway to monitor and manage the Rocky Mountain Population of trumpeter swans (RMP). The Pacific Coast Population (PCP) and Interior Population breeding segments are largely enumerated by the U.S. portion of the NATSS and these two populations have lower status management needs. The SC discussed the following alternatives to deliver the 2020 survey in the absence of CWS participation:

1. Reallocate funds from PCP segment of the survey in Alaska, and possibly elsewhere, to the Canadian portion for RMP-complex. The SC noted that this is beyond the scope of decision-making of the SC or Committee.

2. Abandon the 2020 survey entirely. Pacific Flyway management plan objectives for trumpeter swans and tundra swans are based on the NATSS and management plans would require a significant revision to address the loss of information from the continental survey. An incomplete continental survey would not meet the data needs of the current management plans.

3. Use other metrics. The Bpop surveys might be a viable alternative, but it is difficult to differentiate between species of swans from the air in a May survey when tundra swans might still be migrating, and there are questions about the relationship in trends between surveys. Christmas Bird Count data also may be an option, but this is likely to be an inaccurate and imprecise metric.

4. Reinstate old survey methods. In the past, the Pacific Flyway conducted a winter survey to enumerate swans in conjunction with a fall survey. The winter survey count, minus the fall count, provided an index to Canada breeding swans that wintered in the U.S. The winter survey was discontinued for safety and other reasons, such as, the NATSS at that time provided the needed information.

The Pacific Flyway representatives to the Committee will convey the proceedings from the SC discussion to the Committee at the next scheduled meeting on September 25th.

Adoption
Pacific Flyway Study Committee
August 21, 2019

Brandon Reishus, Chair
Informational Note 6 – Adjustments to the Allocation of Wyoming Wetlands Society Trumpeter Swans to Approved Release Sites

In March 2019, the Pacific Flyway Study Committee recommended an allocation of Wyoming Wetlands Society (WWS) trumpeter swans for release at approved restoration sites. This allocation depended upon hatching success during spring 2019, which was predicted to be 30 cygnets. The management plan for Rocky Mountain Population (RMP) trumpeter swans requires the RMP Trumpeter Swan Subcommittee to provide an equitable allocation of available cygnets to trumpeter swan restoration release sites if fewer cygnets than anticipated are available for release. The original request was as follows:

1) Blackfoot River Valley, Montana - 5
2) Summer Lake Wildlife Area, Oregon - 5 (≤20% of available allocation)
3) Middle Madison River, Montana - 5
4) Yellowstone National Park - 10
5) Teton Basin, Idaho - 5

Due to severe and unfavorable late winter conditions, and a late spring in the Jackson, Wyoming area, some unexpected nest failures, and an aging flock, production at the WWS was lower than anticipated. Only 11 cygnets were available for release in 2019; therefore, it was necessary to adjust the allocation to meet the reduced number of birds available from the WWS. The new allocation is:

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Adoption
Pacific Flyway Study Committee
August 21, 2019

Contact: Claire Gower

Brandon Reishus, Chair
Informational Note 7 – Pacific Flyway Colonial Waterbird Data and the Avian Knowledge Network

The Avian Knowledge Network (AKN) is a partnership of people, institutions, and government agencies, dedicated to using the best available science to support conservation and management of birds and their habitats. AKN members have developed protocols for collecting and uploading data to AKN databases; tools to describe, view, aggregate, and analyze bird monitoring data; and a framework for the cooperative development of new data visualization and analysis tools. Data storage warehouses exist at the Cornell Lab of Ornithology, Point Blue Conservation Science, Bird Studies Canada, and the Bird Conservancy of the Rockies. Several regional data nodes (e.g., the Midwest Avian Data Center and Avian Knowledge Northwest) and theme-based nodes (e.g., the Pacific Shorebird Monitoring Network) provide online access to data input and analysis tools. The AKN currently houses over 800 projects and 8 million data records, and is growing daily.

Since early 2019, the Pacific Flyway Nongame Technical Committee (NTC), via the AKN Steering Committee, has worked with the Mississippi Flyway on the development of a data entry protocol to allow for the housing and analysis of colonial waterbird data (e.g., American white pelican and double-crested cormorant colony counts) collected by the flyways and other partners. The state of Tennessee provided funding and contracted with Point Blue to complete protocol development. As the Pacific Flyway is the only flyway thus far to coordinate colonial waterbird surveys on a large scale, data collected the last several years for American white pelicans and double-crested cormorants have provided the building blocks of this protocol. As a result, the protocol is specifically tailored to fit data collected by the Pacific Flyway and will serve as the standard to be used by other flyways that would like to include their data in the AKN.

The protocol is currently in beta testing and is anticipated to be ready for use by the flyways and partners by the end of the year. This protocol will be available through all AKN nodes. Development of particular data analysis tools of interest to the flyways will be discussed in the coming months.

Adoption
Pacific Flyway Nongame Technical Committee
August 21, 2019

Neil Clipperton, Chair

Contact: Colleen Moulton
Subcommittee Reports
Population Status
The Winter 2018-2019 Survey of the Lower Colorado River Valley (LCRV) population of Sandhill Cranes counted 2,922 cranes. This is 22% higher than the previous year’s count (2,396). The most recent three-year average is 2,678 which is (7%) higher than the Pacific Flyway Council LCRV Sandhill Crane Management Plan (2,500).

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</table>

Averages: 1,032 | 606 | 610 | 272 | 2,493

Harvest Information
There was no harvest on the LCRV population of Sandhill Cranes during the 2018-2019 hunting season.

Management Activity
None reported
Research Activity
Dan Collins, Region 2 Migratory Bird Management Office, provided updates on activities related to GSM/GPS transmitter work on several greater sandhill crane populations including the LCRV. He reported that efforts are ongoing to band additional cranes in order to get approximately 100 new birds marked with auxiliary markers. There are already ~ 550 birds marked in this population.

Recent Publications


Recommendations
No recommendations were forwarded.

Midcontinent Sandhill Crane Subcommittee
    Jason Schamber, Alaska Department of Fish and Game

Population Status
The Management Guidelines for the Mid-continent Population of Sandhill Cranes identifies the annual spring photo-corrected aerial transect survey of the Platte River in Nebraska as the primary measure of population status. The management index is the average of the three most recent and reliable photo-corrected estimates from the annual spring survey. The 2019 photo-corrected estimate was 945,996 cranes and the management index (2017-2019) was 840,000 cranes. The management index is 43% above the upper threshold of the population objective range of 350,000–475,000 cranes.

Harvest Information
In the 2018-2019 season: Alaska reported a harvest of 705 cranes (HIP), Arizona harvested 587 cranes, and New Mexico reported a harvest of 284 cranes.

Management Activity
Wyoming reported that the Central Flyway is considering implementing a parts-collection survey of mid-continent cranes to inform harvest estimates.

Research Activity
No research activity reported.

Recommendations
The subcommittee recommends no change in the Alaska season frameworks for midcontinent sandhill cranes.
Pacific Coast Population Sandhill Crane Subcommittee  
Jason Schamber, Alaska Department of Fish and Game

Population Status  
The Pacific population of sandhill cranes is monitored using a winter aerial transect survey in California. The 2019 estimate was 39,230 cranes; 36% above the objective of 25,000 cranes wintering in California.

Harvest Information  
Alaska is the only state in the Pacific Flyway that harvests Pacific sandhill cranes. The most recent estimate of Alaska harvest was 180 cranes in the 2017-18 season (HIP).

Management Activity  
The Management Plan for the Pacific Coast Population of Sandhill Cranes (Plan) is currently under revision. The subcommittee voted to reframe the Plan as an assessment document rather than a management plan because of the complexity in conservation status across Pacific Flyway states and to better reflect the general nature of the management needs, prescriptions and guidance contained in the Plan. Depending on state classification, cranes fall under both game and nongame in the Pacific Flyway (designated as a game bird in Alaska and Oregon, and a nongame bird in Washington and California). The subcommittee scheduled a conference call for this winter to address outstanding items. California agreed to lead future efforts to incorporate comments and edits from the subcommittee during winter 2019-20.

Research Activity  
No research activity reported.

Recommendations  
The subcommittee recommends no change in the Alaska season frameworks for Pacific sandhill cranes.

Rocky Mountain Sandhill Crane Subcommittee  
Claire Gower, Montana Fish, Wildlife, and Parks

Population Status  
The September 2018 survey of the Rocky Mountain Population (RMP) of sandhill cranes (cranes) counted 21,801 cranes, a 11.3% increase from 2017 (19,592 cranes). The most recent three-year average (2016-2018) is 21,219 cranes. This average is above the population objective range of 17,000 – 21,000 cranes described in the Pacific Flyway Council (Council) RMP Sandhill Crane Management Plan.

The 2019 fall staging survey will be flown the week of September 16.

Harvest Information  
State harvest estimates for the 2018 crane harvest indicate Montana harvested 154 cranes (from an allocated 425), Idaho harvested 235 (from an allocated 306), Wyoming harvested 189 (from
an allocated 211), Utah harvested 203 (from an allocated 246), Arizona harvested 102 (from an allocated 157), and New Mexico harvested 678 (from an allocated 750). The reported harvest does not include crippling loss. The 2018 total harvest estimate was 1561 which was 75 % of the total harvest allocation (total allocation of 2,095).

**Management Activity**
A recommendation was approved by the Council in September 2017 to increase the crane season from 30 to 60 days. For the 2018 hunting season, Montana and Utah both extended the number of days to 60. Both states will retain the same season length for 2019.

Claire Gower (MT) reported that Montana is considering a new hunt area north of Great Falls. This is already part of the survey area so three years of data are already in place. Montana may make a recommendation fall 2020 for a potential hunting season in 2021. There is also some interest in a crane season in Park County; 2018 was the first year data were collected, with over 700 cranes counted.

Last fall, Mason Cline (NM) provided an update on the Estancia Valley (EV) crane hunt. Currently, the sandhill crane season in the EV is experimental, with a requirement to monitor the level and subspecies composition of the harvest and to assign Greater sandhill cranes harvested during this season to the Rocky Mountain Population (RMP) crane quota. From 2017 to 2019, harvest in the EV season was monitored via mandatory hunter check stations. During this time period, approximately 1-2% of harvest was RMP sandhill cranes (1-2 birds out of a harvest of approximately 100 birds in the EV hunt). New Mexico will continue to monitor the level and subspecies composition of the harvest in the EV season using bill cards and assign Greater cranes harvest to the RMP crane quota. NM have put forward a joint recommendation (CF and PF) to change the status of the EV crane hunting season from experimental to operational.

**Research Activity**
Dan Collins (USFWS Region 2) gave an update on the GSM/GPS transmitter work. Five of the six units deployed in AZ are still active. Other units were being deployed by the interior states in Arizona summer 2018, with remaining units to be deployed on the wintering grounds in NM. To date nine units have been deployed on the summer / breeding areas in the interior states - two adults in MT (one in the Ruby Valley and one in the Paradise Valley); four in Idaho, (one adult, one colt at Little Camas Reservoir and two colts at Bear Valley); three adults in CO (one on the White River and two in the Yampa). Montana, UT and CO will try another round of capture on adults at the end of this month.

Dan Collins reported that efforts to ramp up banding in NM will take place this winter in order to get auxiliary markers (~100) out on the landscape to investigate the utility of a mark-resight abundance estimation as a back-up methodology in case aerial survey efforts cannot be conducted. Trapping and banding is occurring on state and federal properties in NM. Since 2012-2019, 551 birds have been marked (AZ -42; CA -14; ID -28; NM – 467).

The USFWS Migratory Bird Program and Science Application program in Region 2 along with Phil Thorpe and Patrick Donnelly are working on a predictive modeling effort to inform when
the Fall RMP survey should take place and more effectively determine the survey window to obtain good counts.

Matt Boggie finished his PhD, conducted in the Middle Rio Grande Valley (MRGV) to evaluate movement patterns, resource and habitat selection, carrying capacity, subsidization of agriculture crops, and bioenergetics of the MRGV for RMP cranes.

In 2018, Dave Olson (USFWS Region 6) provided an update on a project that will investigate how changing water regimes, and consequently, wetland food and water resources will impact the carrying capacity of cranes in the San Luis Valley. Rachel Vanausdall is a new graduate student. She will be doing field work this fall in the San Luis Valley, CO and start classes at Colorado State University this winter.

**Recent Publications**
https://doi.org/10.1371/journal.pone.0206222

**Recent Recommendations**
The subcommittee forwarded two recommendations:
- Accept the hunt allocation based on the results of the 2019 September survey and the recruitment survey.
- Change the status of the Estancia Valley crane hunting season in New Mexico from experimental to operational.

**Interior Band-tailed Pigeon Subcommittee**
Blair Stringham, Utah Division of Wildlife Resources

**Population Status**
The Interior population of band-tailed pigeons is monitored by the Breeding Bird Survey. Since 1968, the trend in the median annual count has declined 5.2% per year. Population trends in the most recent 10-year period (-3.75% and 1.32%) are inconclusive due to low sample sizes, as a result, variances are high.

**Harvest Information**
Estimated harvest of the HIP in 2018 was 200 birds, which was down from 300 in 2017. Utah reported no harvest from their state survey in 2018.

**Management Activity**
Colorado sold 455 permits to hunters this year. This data wasn’t sent in on time to be included in the population status report. Arizona is working on logistical challenges of getting permit numbers included in future status reports. All other state data is in the population status report.
Arizona is continuing banding and PTT work. The subcommittee will meet at the spring 2020 meeting to further discuss collaboration on projects and assess future band-tailed pigeon priorities in the flyway.

**Research Activity**
Region 2 is working to identify funding for GPS units for a master’s student project focusing on survival estimates for a transient group of pigeons.

A movement study was recently published on New Mexico birds:

A survival study paper for New Mexico birds is in progress by Dan Collins, Guthrie Zimmerman and Bill Kendall.

**Recommendations**
No changes.

**Pacific Coast Band-tailed Pigeon Subcommittee**
Melanie Weaver, California Department of Fish and Wildlife

**Population Status**
Pacific Coast band-tailed pigeon population indices are monitored by the mineral site survey (MSS). Results from the MSS suggested no trend in the median annual count of Pacific Coast band-tailed pigeons seen at mineral sites since 2004, and no trend in the last five years. Trends in abundance during recent five- and 10-year periods were not significant.

**Harvest Information**
Harvest and hunter participation are estimated from the Migratory Bird Harvest Information Program. Preliminary estimates from the 2018 season indicated total harvest, active hunters, and total hunter days afield for Pacific Coast band-tailed pigeons were 11,600 (95% CI = 5,000–18,300) pigeons, 3,200 hunters, and 8,900 (4,500–13,400) days afield, respectively. Harvest composition during 2018 was 25% hatching year birds based on a total sample of 115 pigeons.

**Management Activity**
British Columbia investigated the presence of mineral sites at the north end of Vancouver Island in August 2019. Washington will investigate the presence of mineral sites in the Olympic Peninsula region in 2020.

**Research Activity**
Nothing to report.

**Recommendations**
The subcommittee recommended no change in the season framework for Pacific Coast band-tailed pigeons.
Western Management Unit Mourning and White-winged Dove Subcommittee
Russell Woolstenhulme, Nevada Department of Wildlife

Population Status
Predicted abundance of mourning doves for September 2019 in the WMU was 49.33 million (70% Credible Interval = 41.95–57.61). This abundance results in a “Standard” regulatory alternative as prescribed by the harvest strategy.

White-winged dove abundance is assessed through two surveys: the North American Breeding Bird Survey (BBS) and a state-specific survey in Arizona. The BBS indicates continental white-winged dove abundance has increased significantly during the most recently available 10-year period (2005–2015); however, abundance has not changed significantly in Arizona, California, or the Western BBS area during that same time period. White-winged doves continue to expand their range northward. The short-term trend for the Western BBS was 1.16 (-0.72 to 3.29). In Arizona, relative abundance data for white-winged doves is collected by call-count survey in May. Average annual count per route has remained stable or increasing, from 2007–2017 (Table 1).

Table 1. Average number of white-winged doves heard per route in Arizona during May call count surveys, 2007–2017.

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<tr>
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</table>

*Bird density index per 20 mile transect

Harvest Information
The 2017 WMU Mourning dove harvest estimate was 1,457,700, up 12% from 2017. The 2018 white-winged dove harvest estimate was 110,752, a 1% increase from 2017.

Management Activity
Federal band inscriptions applied to mourning doves changed in 2018, moving to an all internet reporting approach. For these new bands, reporting probability is uncertain. This information is vital to estimating harvest rates of mourning doves across the US, and for obtaining unbiased estimates of mourning dove abundance used to make annual regulatory decisions.
A 3-year reward band study to estimate band reporting probability began in 2019. The study requests that banders apply reward and control bands during normal mourning dove banding operations in July and August.

Dove banding operations are ongoing at this time and banding summaries will be provided at a later date.

Research Activity
Nothing to report.

Recommendations
The subcommittee forwarded two recommendation;

- The subcommittee recommends the “Standard” regulatory alternative as prescribed by the mourning dove harvest strategy, which is no change from 2010 season. The dove season framework includes mourning doves and white-winged doves in the aggregate.
- The Subcommittee recommends proposing to the council that zoning criteria be established for the Western Management Unit.

**Aleutian Canada Goose Subcommittee**
Kyle Spragens, Washington Department of Fish and Wildlife

Population Status
Based on indirect estimates from mark-re-sight data, the 2019 population estimate was 198,905 (SE = 27,657; 95% CI = 144,697–253,113), and the most recent three-year average is 179,596. This represents a 16.1% increase from the 2018 estimate and is above the 60,000 goose population objective.

Harvest Information
There is no efficient method for indexing Aleutian Canada goose harvest in the Pacific Flyway. Thus, reported harvest from individual states is considered a minimum.

Melanie Weaver (CA) reported a harvest of 34 geese based on data from check stations at public hunt areas. This does not include Humboldt Bay National Wildlife Refuge harvest.

Brandon Reishus (OR) reported hunter self-classification of Canada geese from a random telephone survey of Northwest Permit holders is not a reliable method to derive Aleutian Canada goose harvest.

Kyle Spragens (WA) reported harvest of 35 Aleutian geese based on field checks in southwest Washington.

Management Activity
Annually, a sample of geese is marked with plastic neck collars in California as part of a mark-resight program to estimate population abundance. California Department of Fish and Wildlife has committed to continue collaring geese during late October or early November in the San
Joaquin Valley. Resight efforts will continue during January-March in California and Oregon. Melanie Weaver (CA) reported that 404 geese were marked in California during October 2018, and plans to continue banding efforts in fall 2019 with a goal of marking 400 geese.

Research Activity
None reported.

Recommendations
The subcommittee recommended no changes in the season frameworks for Aleutian Canada geese.

Cackling Canada Goose Subcommittee
Jason Schamber, Alaska Department of Fish and Game

Population Status
The management index for the cackling Canada goose population is the three-year average projected fall population size; which is calculated by multiplying the indicated total bird index from the Yukon-Kuskokwim Delta Coastal Zone Survey (YKDCZS) by an index ratio of 3.42. The index ratio is estimated as the ratio between the indicated total bird index from the YKDCZS and population estimates derived from mark-resight data collected in 1989-2003 and 2011-2013. The 2019 cackling Canada goose projected fall population is 205,262 (95% CI: 181,371–229,154). The management index (three-year average; 2017-2019) is 235,137 birds, 6% below the population objective of 250,000. The annual population growth rate of the fall population index calculated over the most recent 10 years (2010–2019) was -4% (95% CI: -20%–12%) and 4% (95% CI: -4%–13%) over the long-term (1985–2019).

Harvest Information
There is no reliable method to differentiate the various subspecies of Canada geese from the U.S. Fish and Wildlife Service’s (Service) parts collection survey, and therefore, there is no way to generating an estimate of total cackling Canada goose harvest in the Pacific Flyway is not possible. However, various state surveys/check stations provide some information about harvest.

In 2015-16, the Oregon Department of Fish and Wildlife initiated a random telephone harvest survey of hunters authorized to hunt geese in northwest Oregon. Oregon reported an estimated harvest of 17,809 cackling Canada geese in northwest Oregon in 2018–2019 based on hunter self-classification of Canada geese.

Washington reported a Canada goose harvest estimate of 3,815 in southwest Washington based on their state Mandatory Harvest Report Card (initiated during the 2018-19 season). Bag checks in this region documented that the harvest was composed of 55.4% cackling Canada geese for a harvest estimate of 2,114.

California reported a harvest of 121 cackling Canada geese on state-operated public hunting areas.
The Canadian Wildlife Service’s National Harvest Survey estimated a harvest of 6,125 (SE 1,070) in British Columbia in 2018-19.

Management Activity
The Yukon Delta National Wildlife Refuge (YDNWR) worked with the Association of Village Council Presidents-Waterfowl Conservation Committee (AVCP-WCC) to assess the use of helicopters to capture cackling Canada geese rather than the traditional method involving fixed-wing aircraft. This was the second year of this project and helicopter use was considered more efficient and more productive than fixed-wing aircraft. A total of 539 birds were banded (281 adults and 258 juveniles). A member of the AVCP-WCC, who participated in this project, will provide a summary report to the AVCP-WCC at their 30 August meeting. The YDNWR will request the support of the AVCP-WCC to continue to use helicopters in future banding operations.

In 2017, Oregon was granted permission to increase their 4-bird daily bag limit to a 6-bird daily bag limit. No changes are proposed to the Oregon 4-bird daily bag limit for the 2019-20 season because of the lower management index in 2018 and 2019. Oregon is proposing to stay at a 4-bird bag limit for the 2020-21 season pending the results of the 2020 survey data.

USFWS Region 1 continues to issue depredation permits allowing the take of Canada geese.

Research Activity
Under Arctic Goose Joint Venture (AGJV) project #134 (Evaluation and improvement of U.S. goose harvest estimates and Lincoln estimator), ~14,000 Canada/cackling and Ross’s/snow central tail feathers were measured at the 2019 Parts Collection Surveys (wingbees), and ~2,000 samples were collected and shipped to USDA-APHIS, Fort Collins, CO for genetic testing. One hundred and twenty-five samples were selected for initial development/testing of primers. A lab technician will start work on this project in September 2019 and conduct the first phase of genetic testing (i.e., Canada/cackling geese) in fall/winter 2019. Preliminary analyses of the goose measurement data and an initial outline of the Lincoln estimator cost-benefit analyses have been conducted, and a preliminary report of these analyses will be provided for the 2019 fall AGJV meeting.

Recommendations
The subcommittee recommends no change to general goose frameworks except to adjust season dates from the last Sunday in January to January 31.

The subcommittee recommends no change in the Alaska season frameworks for cackling Canada geese.
Dusky Canada Goose Subcommittee
Kyle Spragens, Washington Department of Fish and Wildlife

Population Status.
The 2019 Total Breeding Ground Index of 17,727 (95% CI=12,834–22,619) was the second highest ever (Marks and Wilson 2019 memo). The most recent 3-year (2017–2019) average population index of 14,408 was 44% above the 10,000-population index to maintain management Action Level 1, per the Pacific Flyway Council management plan for this population (2015). Estimates of geese on Middleton Island were derived from nest plot surveys in 2015-2018 (ADFG, unpubl. data) and ground counts of all adult birds in 1986-2014 (Petrula and Smith 2017).

The production survey in Alaska recorded 2,848 adult geese and 1,635 goslings. This productivity follows three consecutive years of low productivity from the Copper River Delta and Egg Island.

Harvest Information.
Washington Department of Fish and Wildlife reported 16 violations of dusky Canada geese taken in Goose Management Area 2, primarily in the proximity of Ridgefield National Wildlife Refuge, Shillapoo Wildlife Area, and Pacific County, Washington. Oregon Department of Fish and Wildlife reported enforcement activities encountered 3 harvested dusky geese in the Northwest Permit Zone last season.

Management Activity.
Following a biannual every other year schedule, no banding occurred in 2019, with anticipated deployment of neck collars in summer 2020.
Brandon Reishus (OR) and Kyle Spragens (WA) reported collar reading efforts will be maintained at similar levels of effort as in previous years.
Andre Breault (CWS) reported that 77 dusky Canada goose neck collars were observed during the 2018-2019 collar reading efforts. A total of 2,050 dusky Canada Geese were observed in early November 2018, and 823 dusky Canada geese were encountered in January 2019 in coastal British Columbia.
The 2019 dusky Canada Goose Mark-resight Data Assessment to estimate apparent annual survival rates and number of geese with a neck collars reported survival rates were 0.646 (SE = 0.013, 95% CI = 0.620–0.672) during 1997–2000 and 0.808 (SE = 0.006, 95% CI = 0.796–0.819) during 2001–2018. The number of marked birds estimated in the population during October 2018 was 861 (SE = 23.8, 95% CI = 821–915; Sanders and Olson, May 7, 2019 memo).

Research Activity.
An update was provided on preliminary results from a joint project between U.S. Forest Service, Chugach National Forest and U.S. Geological Survey – Alaska Science Center to assess the effect of cottonwood and spruce removal on bald eagles to improve dusky Canada goose nest survival. Monitoring efforts are targeted at quantifying patterns of eagle use within and adjacent to the identified project area, assessing changes in eagle distribution relative to vegetative treatment, and to quantify patterns of nest survival relative to vegetation treatment. Post-treatment removal resulted in a net increase of 84 acres between 100-200 meters from potential eagle perch trees, and 284 acres greater than 200 meters from potential eagle perch trees. Results from surveys and nest monitoring are being analyzed and a final report is anticipated in spring 2020.
Recommendations.
The subcommittee recommended no changes in management strategies for dusky Canada geese.

Lesser, Taverner’s and Vancouver Canada Goose Subcommittee
David Safine, U.S. Fish and Wildlife Service, Alaska Region

Population Status
The statewide population index for Taverner’s Canada geese in Alaska is the sum of Canada goose indices from three annual aerial breeding population surveys: the Arctic Coastal Plain (ACP) Survey, the Yukon-Kuskokwim Delta Coastal Zone Survey, and the Waterfowl Breeding Population and Habitat Survey (WBPHS: Strata 9, 10, and 11). The 2019 indicated total bird index was 58,924 (95% CI = 48,729–69,119). The 2019 index was 29% above the most recent 10-year (2010–2019) average (45,592, 95% CI = 41,964–49,220). The posterior mean of the average annual growth rate ($\bar{r}$) was 1% (95% CI = -16% to 17%) during the most recent 10-year period (2010–2019).

The Alaska-Yukon population index for lesser Canada geese is the sum of stratum-specific indices from the WBPHS (Strata 1, 2, 3, 4, and 12). An undetermined but small proportion of Canada geese on the ACP are also believed to be lesser Canada geese but they are not included in the Alaska-Yukon index. The 2019 indicated total bird index was 13,066 (95% CI = 0–26,871). The 2019 index was 166% above the most recent 10-year (2010–2019) average (4,908, 95% CI = 3,269–6,547). The high estimate in 2019 was due in part to an unusually large number of flocked birds being observed. The posterior mean of the average annual growth rate ($\bar{r}$) was -9% (95% CI = -25% to 7%) during the most recent 10-year period (2010–2019) and 1% (95% CI = -6% to 8%) over the history of the survey (1964–2019).

Harvest Information
Oregon reported a harvest of 1,897 lesser and Taverner’s Canada geese from the Northwest Permit Zone (self-classified and reported by hunters during the 2018-2019 season). Washington reported small Canada goose harvest of 20,351. In southwest Washington, total reported harvest (corrected by field bag checks) was 241 lesser, 462 Taverner’s, and 0 Vancouver Canada geese.

Management Activity
The 2018–2019 hunting season in the southwest Washington zone was the first year that Washington Department of Fish and Wildlife required a mandatory harvest report by hunters.

Research Activity
This was the second year of Chris Latty’s (Arctic National Wildlife Refuge [Arctic NWR]) research project to determine wintering areas, migration routes, and habitat use of nesting Canada geese from the eastern ACP. The project is a collaborative effort between the Arctic NWR, Oregon Department of Fish and Wildlife, Alaska Department of Fish and Game, and USFWS Alaska Region. Cackling goose minimum nest densities at a study site on the eastern section of the Arctic Refuge Coastal Plain increased from about 0.25 nests/km$^2$ in 1979-1980 to ~ 4.5 nests/km$^2$ in recent years. On the eight birds marked in 2018, collars performed poorly, with three birds reporting some data, and only one bird reporting locations through the winter. The only bird to
report throughout fall migration and winter migrated along the Mackenzie River into Alberta, then east of the Rockies until reaching Albuquerque, New Mexico where it wintered. It left the Albuquerque area in early February, using agriculture fields in southern Colorado through at least mid-March (the last time it transmitted data). In 2019, three collared birds were relocated on the Arctic NWR study area, and two collars were recovered and returned to the manufacturer to determine if the devices collected any GPS data. Eight additional birds were marked with GPS/GSM collars (using a new design) in 2019. There are plans to mark additional birds in 2020, including birds at Prudhoe Bay, and potentially further to the east and west if funds were available.

**Recommendations**
- The subcommittee recommends no change to the goose season frameworks except to adjust season dates from the last Sunday in January to January 31st.

**Western Canada Goose Subcommittee**

Jeff Yost, Colorado Parks and Wildlife

**Population Status**
The 2019 breeding population index for Pacific Population (PP) Canada geese is 346,991, a 1% decrease from the 2018 index of 350,684. The 3-year average (2017–2019) is 331,448; up 4% from the previous 3-year average of 319,583 (2016–2018). The breeding population index for Rocky Mountain Population Canada geese in 2019 is 175,652, a 30% decrease from the 2018 index of 252,695. The 3-year average (2017–2019) is 205,338 down 11% from the previous 3-year average of 230,662 (2016–2018). The RMP management plan objective is a breeding population index of 117,000.

**Harvest Information**
Estimates of Canada goose harvest for 2018-2019 are not available at this time. The 2017–2018 season totals from the U.S. Fish and Wildlife Service (Service) Harvest Information Program are; Arizona 1,624, California 52,876, Colorado 8,852, Idaho 66,012, Montana 19,513, Nevada 4,636, New Mexico 897, Oregon 46,220, Utah 24,178, Washington 46,804, Wyoming 545, and British Columbia 14,207. These estimates are for all Canada geese harvested and are not segregated by population or subspecies.

**Management Activity**
California banded 473 western Canada geese during summer 2019. A small number of Canada geese were banded in Oregon in summer 2019 (exact number not available) with some goslings moved to the Summer Lake Wildlife Area by USDA-APHIS-Wildlife Services to help alleviate nuisance issues in Bend, Black Butte Ranch and Klamath Falls. Adult geese captured with the goslings were banded and released on site except in Boardman, where Wildlife Services is authorized to euthanize adult geese. Utah banded approximately 3,000 geese including 500 urban birds. Washington reported banding 1,071 geese birds across the state. Nevada banded 313 geese and translocated them out of Reno. Idaho relocated 144 geese from Sandpoint to lower Coeur d’Alene. The Canadian Wildlife Service (CWS) did not band Canada geese in British Columbia in 2019.
The CWS issued “kill to remove” permits to the *Guardians of Mid-Island Estuaries Society* authorizing the take of Canada geese in Campbell River, Parksville-Qualicum and Saanich areas in 2019. The Guardians work with the Wei Wai Kum First Nation and the K’omok’s First Nation and the meat from salvaged geese is used as traditional food. A total of 1,440 Canada geese were taken under these permits in the summer of 2019 and the *Guardians of the Mid-Island Estuaries* have taken a total of 4,508 Canada geese in these 3 areas between 2016 and 2019. An additional 64 Canada geese were removed in Penticton (Okanagan Valley) in the summer of 2017. The Canada geese taken on Vancouver Island are a combination of summer residents and moult migrants and the goose removal program is one of the aspects of the estuary restoration activities undertaken by the Society.

The Service issues permits authorizing control of nuisance and depredating Canada geese to entities experiencing damage. In Oregon, Region 1 issues blanket Canada goose depredation permits for agricultural damage without regard to Canada goose subspecies. Utah plans to start scaling back on Canada goose translocations and move towards lethal control methods. Some study committee members expressed concern over the increasing number of lethally controlled geese and how lethal control fits into the goose management plan.

**Research Activity**
No new research activities planned for 2019. Utah’s project in the Salt Lake area using hardened bands on Canada geese as part of a band longevity study is ongoing.

**Recommendations**
The subcommittee adopted one recommendation:
- The subcommittee recommends allowing a closing date of January 31st for Pacific Flyway Canada geese.

**Pacific Brant Subcommittee**
Melanie Weaver, California Department of Fish and Wildlife

**Population Status**

**Harvest Information**
The 2018 HIP estimates are not available but the 2017 estimates were: California 3,200; Oregon 0; Washington 300 (mandatory harvest report indicated 346); Alaska 3,900; Pacific Flyway total 7,400. BC reported harvest of 192 Pacific brant.

**Management Activity**
Izembek National Wildlife Refuge and USGS-Alaska Science Center (ASC) will continue to collect and analyze fall age ratio data at Izembek Lagoon.

USGS-ASC banded 1,000 brant in late July 2018 and 2019 at the Colville River Delta. Experimental GPS neck collars and plain neck collars were placed on a subsample to determine
if collars can be used for a proposed USGS-ASC study on possible disturbance effects to molting brant from helicopters in the Teshekpuk Lake Special Area.

The North Slope Borough and ABR, Inc. and the Environmental Research & Services conducted a photo census of brant on the Ikpikpuk River colonies and an aerial survey of brant nests at 8 colonies between Fish Creek and Utqiagvik in summer 2019, results are pending.

University of Alaska Fairbanks banded 1,194 brant and recaptured 225 previously marked birds at the Tutakoke River colony.

Research Activity
The USGS-ASC continues to monitor survival and productivity of brant on the Colville River delta.

Recommendations
The Subcommittee did not propose any changes.

Emperor Goose Subcommittee
David Safine, U. S. Fish and Wildlife Service, Alaska Region

Population Status
The management index for emperor geese is the annual indicated total bird index from the Yukon-Kuskokwim Delta Coastal Zone Survey (Pacific Flyway Council 2016b, Alaska Migratory Bird Co-Management Council 2016). The 2019 emperor goose indicated total bird index was 26,585 (95% CI = 24,161–29,008), which is 3% below the most recent ten year (2010–2019) average index of 27,333 (95% CI = 26,309–28,357). The 2019 management index of 26,585 indicated total birds is 22% below the population objective of 34,000, but 16% above the harvest closure threshold of 23,000 birds (Pacific Flyway Council 2016b, Alaska Migratory Bird Co-Management Council 2016). The Pacific Flyway Council management plan and Alaska Migratory Bird Co-Management Council (AMBCC) management plan both indicate that conservation measures should be considered when the indicated total bird estimate is between 23,000 and 28,000. The posterior mean of average annual growth rate ($\bar{r}$) based on the indicated total bird index was 4% (95% CI = -8% to 15%) during the most recent 10-year period (2010-2019), and was 1% (95% CI = -4% to 7%) over the history of the survey (1985–2019).

Harvest Information
The AMBCC’s Harvest Assessment Program estimated a 2017 statewide (five region) total spring-summer harvest of 2,344 (CIP: 83%) birds and 1,443 eggs (CIP: 145%).

The 2018-19 fall-winter hunt was administered by the Alaska Department of Fish and Game (ADFG) using a registration permit system across seven hunt areas with a statewide harvest quota of 1,000 birds. The hunt was open to both Alaska residents and non-residents. Registration permits were issued to 411 hunters, and 150 reported harvesting an emperor goose.
Management Activity
The 2019 spring-summer subsistence hunt began 2 April and will close on 31 August. The 2019-2020 fall-winter hunt will begin on 1 September in four of seven hunt areas and will begin in October in the remaining hunt areas.

The ADFG conducted an aerial survey of emperor geese on the Seward Peninsula during June of 2019, providing a second consecutive year of count and distribution data for this small breeding population. The timing of the survey was late relative to nesting, likely resulting in an expected lower abundance estimate.

Research Activity
USGS-Alaska Science Center reported that a paper on 35 years of annual survival data from western Alaska was submitted to a journal for peer-review. A project that monitored two years of winter habitat use and body condition in the Aleutian Islands and along Alaska Peninsula has been completed and preparation of a publication is underway.

In 2019, Bryan Daniels (Yukon Delta NWR) conducted the third year of emperor goose nesting ecology research on Kigigak Island. Out of 237 emperor goose nests monitored: the mean clutch size was 5.4 eggs; 191 (80.6%) nests had at least one egg hatched; 28 (11.8%) were depredated; 12 (5.1%) abandoned; and 6 (2.5%) were either inviable or had an unknown fate. The crew had 74 re-sights and banded 115 nesting females to estimate survival.

In June 2019, ADFG captured and implanted 30 adult female emperor geese with satellite transmitters on the Yukon-Kuskokwim Delta, Alaska. These transmitters provide location and survival data every fourth day and are anticipated to have a battery life of 2 to 4 years.

Publications
Ramey, A.M., Uher-Koch, B.D., Reeves, A.B., Schmutz, J.A., Poulson, R.L., and Stallknecht, D.E., 2019, Emperor geese (Anser canagicus) are exposed to a diversity of influenza A viruses, are infected during the non-breeding period and contribute to intercontinental viral dispersal. Transboundary and Emerging Diseases, https://doi.org/10.1111/tbed.13226

Recommendations
The subcommittee adopted one recommendation.

• The subcommittee recommends no change in the Alaska Season Framework regulations for emperor geese except that the allowable total harvest be reduced from 1000 to 500 emperor geese.

White Goose Subcommittee
Claire Gower, Montana Fish, Wildlife, and Parks

Population Status
White Goose (Snow goose and Ross's goose) abundance indices from the California Special white goose survey and Skagit-Fraser photo inventory and the Oregon Light Goose and Tundra Swan Survey, estimate of 1,413,764 in winter 2018. This is a 4.3% increase from 2017 (LTA 723,497; 3 year-average 1,558,585).
Every three years, as recommended by the Pacific Flyway Management Plan for the Western Arctic Population of Lesser Snow Geese, a composition survey is conducted to determine the ratio of Ross’s and snow geese wintering in California. The most recent species composition and population estimates from December 2017. This survey estimated 1,217,295 white geese, including 140,458 Ross’s geese, which comprised 11.5% of white geese, compared to 31.9% reported in 2014. The 2017 estimate of 11.5% is also far below the long-term average of 33%. The overall trend for Ross’s geese is stable to slightly increasing, while the proportion of the total wintering white geese is declining. The next composition survey is planned for 2020.

Brandon Reishus (OR) reported the December 2018 white goose and swan survey covered three areas (Willamette Valley and Lower Columbia River, Columbia Basin, and Summer Lake Wildlife Area) in Oregon. Survey methods varied among areas, with aerial photography used for the Willamette Valley and Lower Columbia, a roost fly-off survey for the Columbia Basin, and a ground count at Summer Lake Wildlife Area. Total wintering white goose numbers were 71,108 (18,241 in the Willamette Valley and Lower Columbia with most found at Sauvie Island, 52,837 in the Columbia Basin, 26 at Summer Lake). The counts along the Columbia River (Lower Columbia and Columbia Basin) include adjacent areas of Washington.

Brandon Reishus also reported fall staging snow goose numbers at Summer Lake Wildlife Area continue to be much lower than historical counts. The peak weekly index in fall 2018 (ground count) was 3,807 white geese, similar to the previous 5-year average (4,470). Counts in the late 1950s exceeded 400,000.

Kyle Spragens (WA) reported 109,993 geese were counted from their winter photo inventory on the Skagit-Fraser; the three-year average is 100,054 geese.

Russel Woolstenhulme (NV) reported Nevada discontinued the mid-winter inventory. No data are available.

David Safine (USFWS Region 7) reported lesser snow geese are counted by USFWS-MBM on two aerial surveys in Alaska each year: the Arctic Coastal Plain Survey and the Teshekpuk Lake Molting Goose Survey. On the Arctic Coastal Plain Survey, the 2019 snow goose total bird index was 70,748 (95% CI = 28,861–112,635); 106 % above the most recent 10-year average of 34,374 (95% CI = 25,401–43,347) birds (2010–2019; Wilson et al., In prep). The posterior mean of average annual growth rate (r̅) based on the total bird index on the Arctic Coastal Plain over the most recent 10 years (2010–2019) was 19% (95% CI = 5% to 29%; Wilson et al., In prep).

The Teshekpuk Lake Molting Goose Survey was incomplete in 2018 (Shults and Zeller 2019). The 2017 Teshekpuk Lake snow goose count from the traditional molt survey area was 8,947 adults and 128 goslings; 20% above the most recent 10-year average of 7,435 birds (2008–2017; Shults and Zeller 2017). The average annual growth rate of adult snow goose molting near Teshekpuk Lake calculated over the most recent 10 years (2008–2017) was 7% (95% CI = 1% to 14%) and 13% (95% CI = 11% to 16%) over the history of the survey (1976–2017; Shults and Zeller 2017). Estimates from the July 2019 molt survey will be provided at a later date.
Kyle Spragens (WA) reported, via a memo from Don Kraege, on preliminary numbers from snow goose surveys on Wrangel Island this year. Wrangel Island had low snowpack last winter and very warm temperatures during this year's breeding season. These conditions led to large areas of snow-free tundra for nesting efforts. Vasilii Baranyuk estimated the 2019 spring population at 442,000, with 156,600 nests, 93.7% nest success, and average clutch size of 4.09. The 2019 spring population estimate indicated a large increase in the population, considering the 2018 estimate of 305,800 and the 2017 estimate of 346,000. The main colony occupied a very large area (160 sq. km) with low nesting density and contained 146,600 nests. Another 7,500 nests occurred on the Tundra of the Academy (north of the main colony) and 2,500 nests away from the main colony. Vasilii also reported more lemming activity this year, high productivity of snowy owls and arctic foxes, and continued evidence of wolf and wolverine activity in the colony.

Harvest Information
Washington reported a preliminary harvest through mandatory reporting in the permit zone (Skagit-Delta Region) of 7,500 geese; this was approximately 1,300 more than last year.

Oregon reported 442 snow and 2 Ross’s geese were reported harvested at Summer Lake Wildlife Area, and 210 snow geese were reported harvested at Sauvie Island Wildlife Area. These are the only two ODFW managed public hunting areas with huntable concentrations of white geese in Oregon. ODFW also conducts a random telephone goose harvest survey of Northwest Permit Goose Zone (NWPZ) hunters, which includes Sauvie Island Wildlife Area hunters. This survey estimated 487 snow geese were harvested in the NWPZ last season.

California reported 2,650 white geese were harvested on public hunt areas only.

Idaho has no current harvest information to report.

Nevada reported that no harvest survey questionnaire was conducted, and therefore, no data were available.

Alaska reported 5,602 white geese were harvested during the subsistence hunt in 2017; down from 11,202 in 2016. (2017 is the most recent estimate)

British Columbia reported a harvest of 1,610 Wrangel Island birds. This was a low harvest compared to other years.

Management Activity
No data is currently available on Wrangel Island banding.

Eric Reed (CWS) submitted a report on the 2019 banding program on Banks Island. This year was the 5th year of snow goose banding on Banks Island and 2,664 snow geese were captured (2,604 new birds banded and 60 recaptures). Seven of these birds were foreign recaptures (six from AK and 1 from Wrangel Island). Thirty-five GSM-GPS neck collars were deployed on snow geese. The financial support received from PFC, AGJV, and CWS provides secure funding at least 2022.
Jason Schamber (AK) reported banding continued on the North Slope in 2019. The North Slope Borough and Alaska Biological Resources, Inc. banded approximately 1,400 snow geese at the Ikpikpuk River colony in summer 2019.

The U.S. Geological Survey-Alaska Science Center (USGS-ASC) banded approximately 1,000 snow geese on the Colville River Delta in summer 2019 with support from USGS and the Arctic Goose Joint Venture.

Jeff Knetter (ID) reported Mark Petrie (DU) has been working on analyses that could suggest overabundant goose populations may have a negative impact on wintering duck populations. Related, a duck body condition study performed by USGS in California did not indicate a decline in body condition from earlier studies. This could influence future management actions (i.e., pursuit of a Conservation Order in the Pacific Flyway).

Research Activity
Jason Schamber (AK) reported the USGS-ASC is developing an integrated population model of north slope breeding snow geese informed by nest monitoring, mark-recapture data, and aerial brood surveys.

Chris Nicolai (USFWS Region 8) reported 13 GPS-GSM transmitters were deployed at the Ikpikpuk River in Alaska this summer to provide additional data on annual white goose spatial patterns.

Chris Nicolai also reported a UC Davis graduate student has deployed 102 transmitters on snow geese. Another student at University of Nevada, Reno will analyze duck movements concurrent with goose data.

Recommendations
The subcommittee adopted two recommendation:
- Recommend no change to the regular goose season framework for white geese
- Recommend no change to the Alaska season frameworks related to white geese

While not a federal framework change, two courtesy notice will be included in the goose omnibus; Washington is considering:
- Modify Goose Management Area 1 to include the portion of Skagit, Snohomish, and Whatcom Counties west of Highway (State Route) 9.
- Modify Goose Management Area 3 to include all other parts of western Washington not included in Goose Management Area 1, 2-Coast and 2-Inland.
White-fronted Goose Subcommittee
Jason Schamber, Alaska Department of Fish and Game

Population Status
The management index for the Pacific Flyway population of greater white-fronted geese is the three-year average of the fall projected population, which is the sum of indicated total bird (ITB) indices from the Yukon-Kuskokwim Delta Coastal Zone Survey and Waterfowl Breeding Population and Habitat Survey expanded by a constant ([ITB x 2.5498] + 71,339) to approximate fall population size. The 2019 Pacific white-fronted goose projected fall population is 479,289 and the management index is 601,650; which is 101% above the current population objective of 300,000. The 2019 indicated total bird index was 159,993; approximately 25% below the most recent ten-year (2010–2019) average index of 212,144. Over the most recent ten years (2010–2019), the average annual growth rate was -2% (95% CI: -5%–2%).

The Alaska component of the midcontinent greater white-fronted goose population breeds in portions of interior and northwest Alaska, and on the Arctic Coastal Plain. The interior and northwest Alaska regions are indexed by the ITB from the Waterfowl Breeding Population and Habitat Survey. The Arctic Coastal Plain region is indexed by the ITB from the Arctic Coastal Plain Survey. The 2019 ITB from interior and northwest Alaska was 30,921; which is 32% below the most recent 10-year (2010–2019) average of 45,707 birds. The annual population growth rate from interior and northwest Alaska calculated over the most recent 10 years (2010–2019) was -3% (95% CI: -14%–8%). The 2019 ITB from the Arctic Coastal Plain was 257,347 (95% CI: 235,366–279,327), which is 0% from the most recent 10-year average of 257,600 birds (2010-2019; 95% CI: 246,472–268,728). The annual population growth rate from the Arctic Coastal Plain calculated over the most recent 10 years (2010–2019) was 2% (95% CI: -16%–20%).

The Management Plan for Midcontinent Greater White-fronted Geese identifies the fall staging survey in Prairie Canada (Alberta and Saskatchewan) as the primary tool to assess population status. The 2018 fall aerial survey index in Canada was 774,097; slightly above the 2017 index of 771,609. The three-year (2016–2018) average is 848,613; 8% below the previous three-year average of 916,277, but well above the population objective of 650,000 birds.

The 2019 tule greater white-fronted goose estimate in California was 6,993; a 59% decrease from the 2017 index (17,123), and 30% below the 10,000-bird objective.

Harvest Information
Oregon reported that at Summer Lake Wildlife Area, a major staging area for tule white-fronted geese and a minor staging area for Pacific white-fronted geese, hunters reported harvesting 175 white-fronted geese; down 3% from the previous 10-season average. Staff also examined a portion of the harvest to separate tule geese from Pacific white-fronted geese. Measurements suggested approximately 60 tule geese were harvested last season at Summer Lake WMA; down 19% from the previous 10-season average. Also, estimated harvest of greater white-fronted geese in the NW Permit Zone derived from random telephone surveys of hunters was 288, which is
higher than normal. The area is a minor white-front staging and wintering area, though much of
the population passes over while in route to wintering areas in California. Hunter also reported
harvesting nine white-fronted geese at Klamath Wildlife Area.

The most recent three-year average (2016–2018) harvest rate estimate for mid-continent
white-fronted geese was 0.054±0.006 [SE] (95% CL: 0.043–0.065), below the harvest
rate threshold of 6%.

Management Activity
In 2018, the CDFW and ODFW trapped 56 Tule geese and deployed 20 VHF radios at
Summer Lake WMA. A complete report for the 2018-2019 Tule Project results follows
this subcommittee report.

CDFW and ODFW will continue to mark tule white-fronted geese at Summer Lake with VHF
radio collars in September 2019 for ongoing population estimation work.

The Service-Alaska Region was unable to conduct banding of mid-continent greater
white-fronted geese at the Innoko National Wildlife Refuge due to smoky conditions
from wildfires that grounded fixed-wing aircraft needed for operations.

The Service (Region 1) continues to issue depredation permits in Klamath county to
address agricultural damage issues.

The Canadian Wildlife Service (CWS) has announced plans to withdraw their participation in the
fall survey count after 2019. CWS is advocating use of banding and harvest data via Lincoln-
Peterson estimates to monitor future population status.

Research Activity
The Service-Region 2 reported that the states of Texas and Louisiana have ongoing studies of
midcontinent white-fronted geese.

The Service-Region 8 reported that USGS deployed 18 GSM-GPS transmitters on Pacific white-
fronted geese in 2018-19.

California reported on tule goose survival, recovery, and harvest rates for leg-band only and
collared birds from banding efforts at Summer Lake, OR and Sacramento Valley, CA in 2003-
2018:

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Recommendations
The subcommittee adopted two recommendations.
- Recommend no change to Alaska season frameworks for white-fronted geese.
- Recommend no changes to seasons and bag limits for regular white-fronted goose seasons in the Pacific Flyway.

Western and Eastern Tundra Swans Subcommittee
Jason Schamber, Alaska Department of Fish and Game

Population Status
Western Population: The status of Western Population (WP) tundra swans is measured using a three-year average of the breeding ground index (Pacific Flyway Council 2017), derived from the combined total bird indices from both the Waterfowl Breeding Population and Habitat Survey (Stratum 8 [Bristol Bay], Stratum 9 [interior Yukon-Kuskokwim Delta], Stratum 10 [Seward Peninsula], and Stratum 11 [Kotzebue Sound]) and the Yukon-Kuskokwim Delta Coastal Zone Survey (Pacific Flyway Council 2017). The 2019 breeding ground index was 101,102 (95% CI: 77,881–124,323). The management index was 127,556 swans; 113% above the population objective of 60,000 swans. The 10-year (2010-2019) average annual growth rate of the breeding ground index was -1% (95% CI: -11%–10%).

During winter 2018–2019, the following states counted tundra swans: California 89,404; Nevada 1,481; Oregon, including adjacent areas of southwest Washington, 1,004; Utah 11,241; and Washington 2,068. Additionally, Oregon counted 10,762 unidentified swans; though the vast majority are known to be tundra swans.

Eastern Population: The management index for the Eastern Population (EP) of tundra swans is the three-year average of the annual combined Mid-winter Waterfowl Survey in the Atlantic (AF) and Mississippi (MF) flyways. In 2018, a total of 111,614 swans was counted during the combined Mid-winter Survey; below the count of 119,287 swans reported in 2017. The three-year average mid-winter index was 107,906; well above the Management Plan population objective of 80,000 swans, but below the 110,000-swan threshold that allows for 12,000 permits to be issued across EP tundra swan hunt states for the 2020-21 season.

Tundra swans breeding east of Point Hope and across the Alaska Arctic Coastal Plain (ACP) belong to the EP, as they winter principally in the Atlantic Flyway from New Jersey to South Carolina. Since 1986, tundra swans nesting on the ACP have been monitored via a breeding pair survey. The 2019 total bird index from the ACP survey was 21,807 (95% CI: 17,530–26,084). The 10-year (2010–2019) average annual growth rate was 3% (95% CI: -3%–5%).

Harvest Information
Western Population: Hunting of WP tundra swans is regulated by state-issued permits, which allow for reliable estimates of hunter activity and harvest. Allocation and number of permits within the Pacific Flyway in 2018–2019 were as follows: Alaska–1,300; Nevada–650; Utah– 2,000; and Montana–500. Permit numbers for Nevada, Utah, Montana, and Alaska will be the same in 2019–2020.
During the 2018 fall-winter season, an estimated 38 tundra swans were harvested by permit in western Alaska. The estimated harvest was zero swans in Unit 17 (Bristol Bay), 18 swans in Unit 18 (Y-K Delta), 19 swans in Units 22 (Seward Peninsula), and one swan in Unit 23 (Kotzebue Sound).

In 2018–2019, Utah reported a harvest of 947 swans, with five trumpeter swans harvested. Nevada harvested 236 swans and zero trumpeter swans were included in the harvest. Montana had a harvest estimate of 121 swans that included 11 trumpeter swans. Eastern Population: The state of Delaware will begin conducting an approved experimental tundra swan season in the 2019–2020 fall-winter season. The permits for the Delaware tundra swan hunt will be allocated from the permits allotted to existing EP tundra swan hunt states.

Subsistence Harvest: Subsistence harvest estimates of birds and eggs in Alaska are derived from a survey of five regions that comprise 90% of the total statewide subsistence harvest. Sampling effort was designed to obtain moderately precise statewide total harvest estimates of the 10 most commonly harvested species. Swans are not among the most commonly harvested species; therefore, precision of the estimate is coarse. Further, the estimate for swans does not discriminate between tundra and trumpeter swans. The estimate of statewide subsistence harvest of swans in Alaska was 2,071 (CIP: ±65%) in 2017.

Management Activity
The AF and MF Study Committees will be submitting a recommendation to their respective Councils at the fall regulatory meetings to reduce the overall number of allowable permits by 25% for 2020-21 season, in response to the management index falling below the 110,000-swan threshold.

Research Activity
No research activities reported

Recommendations
The subcommittee adopted three recommendations that include:
• No change in the general frameworks for swan hunting, except:
  ■ Allow the swan season to be split into two segments to align with duck seasons
  ■ Include swan hunting in northern ID in the general swan frameworks
• No change in Alaska season frameworks for tundra swans.

Pacific Coast Population Trumpeter Swan Subcommittee
David Safine, U. S. Fish and Wildlife Service, Alaska Region

Population Status
The North American trumpeter swan survey has been conducted by cooperators throughout Canada and the northern United States approximately every five years since 1968 to assess abundance, productivity, and distribution of trumpeter swans (Cygnus buccinator). During the most recent survey in 2015, swan abundance for the Pacific Coast Population (PCP) was 31,642±1,432 SE; an 18% increase from the 2010 estimate of 26,790±1,060 (SE). In 2015,
cygnets were 32% of PCP swans; higher than the 22% observed in 2010 and the 1968-2010 average of 25%. Mean brood size in 2015 was 3.02 cygnets; slightly higher than 2.85 cygnets per brood observed in 2010.

During the 2019 northwest Washington Swan Survey, a total of 15,208 trumpeter swans were counted.

**Harvest Information**
The Pacific Coast Population of trumpeter swans is not subject to sport or subsistence harvest.

**Management Activity**
Washington Department of Fish and Wildlife reported that during the 2018–2019 winter, 453 trumpeter swan mortalities were recorded. Of these 453 birds, more than 300 of the mortalities were caused by lead poisoning.

The international steering committee is planning the 2020 North American trumpeter swan survey. The steering committee held a teleconference in early August 2019, and an informational note regarding current planning efforts was produced.

**Research Activity**
None reported.

**Recommendations**
The subcommittee did not propose any recommendations for the Pacific Coast Population of trumpeter swans.

**Rocky Mountain Trumpeter Swan Subcommittee**
Jeffrey Knetter, Idaho Department of Fish and Game

**Population Status**
The most recent survey of the U.S. breeding segment the Rocky Mountain Population (RMP) of trumpeter swans was conducted during September (fall) 2018. The survey includes data from the tri-state region (Idaho, Montana, and Wyoming) and restoration flocks (Flathead Valley, Montana, Nevada, and Oregon). Fall survey data were used to monitor total number of white birds and cygnets fledged in relation to flyway management plan objectives.

Observers counted 1,043 swans (826 white birds and 217 cygnets), an 8.1% increase from the 2017 count of 965 (781 white birds and 184 cygnets). Plan objectives are 718 adults and subadults (white birds counted during the fall survey). The number of white birds has more than doubled over the last 20 years, from 347 in 1999.

The number of white birds in the Greater Yellowstone Area (600) was similar to the 2017 count of 595. The total number of cygnets increased 27.8%, from 115 in 2017 to 147 in 2018.
The number of birds counted during the 2018 survey included: Idaho, 140 white birds and 26 cygnets; Montana Greater Yellowstone (Centennial Valley, Red Rock Lakes National Wildlife Refuge, Madison Valley), 257 white birds and 72 cygnets – Paradise Valley was not surveyed in 2018; Oregon (Malheur National Wildlife Refuge and Summer Lake Wildlife Area) 32 white birds and 6 cygnets; Wyoming, 203 white birds and 49 cygnets. In the Flathead Valley, Montana, 194 white birds and 64 cygnets were observed. No data were reported for Nevada. Numbers do not include captive-reared swans released in various restoration areas during summer 2018.

The 2019 survey will be completed the week of September 15th.

The 2015 North American trumpeter swan survey remains the most recent population-wide survey to assess abundance, productivity, and distribution of trumpeter swans in North America.

**Harvest Information**

For the 2018-2019 season, Utah reported a harvest of 947 tundra swans and 5 trumpeter swans; there was 95% species identification compliance. Nevada harvested 236 tundra swans and 0 trumpeter swans; there was 90% species identification compliance rate. Montana reported 110 tundra and 11 trumpeter swans harvested, respectively. Montana had a 76% compliance rates for bill card measurements.

**Management Activity**

Planning is underway for the 2020 North American trumpeter swan survey. Josh Dooley (USFWS Division of Migratory Bird Management) has agreed to be the 2020 survey coordinator. The steering committee has held meetings via conference call on April 17 and August 6, and has agreed to the same objectives from the 2015 survey effort:

i. Primary: white swan abundance (adult and subadult)

ii. Secondary: summer range delineation

iii. Optional: productivity (i.e., cygnet abundance, broods, brood size)

All restoration project leads from Idaho, Montana, Oregon and Wyoming (Yellowstone National Park) presented annual reports to the Greater Yellowstone Trumpeter Swan Working Group (GYTSWG) this past winter; consequently, each project was eligible for Wyoming Wetlands Society (WWS) swans in 2019.

The WWS anticipated 30 cygnets would be available for release in 2019. Unfortunately, an aging flock with low productivity resulted in lower than predicted cygnets available for release from the WWS during summer 2019; 11 cygnets were available for release. The allocation was adjusted to meet the reduced number of birds available from the WWS. The Blackfoot Valley project released five cygnets and six cygnets were released in Yellowstone National Park. In Oregon, three yearlings were released at Summer Lake Wildlife Area in spring/summer 2019 - one from The Trumpeter Swan Society (TTSS) captive pair at Aspen Lakes Golf Course, Sisters, Oregon and two were from the WWS (2018 allocation). The TTSS owned and managed pairs in central Oregon produced 12 cygnets (broods of 8 and 4) in 2019. These birds will be held in captivity with their parents until April 2020, when they will be released at Summer Lake Wildlife Area.
In Montana, swans are no longer being released in the Flathead Valley. As a result, swans may be available for release from the Montana Waterfowl Federation; John Jarvis is the contact.

The GYTSWG meeting is planned for mid-winter 2020; a full day meeting will be set aside to discuss spatial modelling work Gregg Neudecker and Service counterparts have been conducting to determine connectivity among trumpeter swan nesting sites. This work could potentially be used to facilitate restoration efforts in the future. Priorities for restoration work, low cygnet availability for allocation, and Flyway management plan goals and objectives associated to restoration efforts and trumpeter swan releases will also be discussed.

Research Activity
Oregon Department of Fish and Wildlife (ODFW) and TTSS purchased five GPS-GSM collars last winter to deploy on wintering trumpeter swans in an attempt to determine the origins of several hundred wintering trumpeter swans in southcentral Oregon. One adult male was captured and marked on March 8, 2019. This swan migrated to the Peace River region of Alberta/British Columbia where it settled about 20 miles south, southeast of Dawson Creek, British Columbia in early April. Based on movements, we suspect this bird and its mate hatched a nest around June 12. The ODFW intends to deploy the remaining collars during winter 2019-20.

Additionally, TTSS has partnered with staff at the Southeast Idaho Refuge complex on a GPS-GSM collar telemetry project. At least three birds have been marked so far; one each at Grays Lake, Camas and Bear Lake NWRs. They plan to mark another at Red Rock Lakes Refuge.

Montana Fish, Wildlife and Parks worked with the WWS to deploy four GPS-GSM Radio neck collars on molting trumpeter swans this summer – two in the Blackfoot Valley and two in the Madison Valley.

Recommendations
The subcommittee approved a recommendation to modify the swan hunting framework to include swan hunting in northern Idaho.

American White Pelican Subcommittee
Michelle McDowell, USFWS
Russell Norvell, Utah
Colleen Moulton, Idaho
Allison Begley, Montana
Joe Barnes, Nevada
Neil Clipperton, California

2018 Implementation of American White Pelican Monitoring in the Pacific Flyway

Survey Goal.
The goal of the Pacific Flyway Council’s American White Pelican Monitoring Strategy (Strategy) is to establish a coordinated, long-term, flyway-level monitoring effort to estimate the breeding population size, trend, and distribution of the western population. This
information is fundamental to support development of effective management recommendations, and for guiding and assessing management actions pertaining to American white pelican (pelican) depredation on fish resources.

Survey Data Summary.
The Strategy was implemented in 2014, 2017 and 2018. Because of the small number of pelican colonies in the west, all known colonies identified in the 2013 Strategy (n=18), plus 3 colonies subsequently identified, were targeted for monitoring across eight states and British Columbia. Data are reported here for all 21 of these sites (Table 1, Figure 1).

The Pacific Flyway Nongame Technical Committee (NTC) coordinated collection of colony data by state and federal agencies, and submitted survey result data to the U.S. Fish and Wildlife Service (Service). The Service compiled these data and produced a breeding population estimate for the western population. Surveys yielded estimates of 42,692 (2014), 46,083 (2017), and 48,304 (2018) breeding individuals (Table 1).

Future Activity.
Monitoring is next scheduled to take place in 2021.

Current and On-going Work.
1. Assisting Point Blue Conservation Science and the Service Inventory and Monitoring Program’s development of a pelican reproductive success framework protocol, by serving on the Core Team (Idaho) and Project Team (Utah, Service)

2. Annual banding and wing-tagging of juvenile pelicans at the Gunnison Island colony in Utah, and at both the Blackfoot and Minidoka National Wildlife Refuge colonies in Idaho. This work has led to:
   a. Survivorship analysis;
   b. Documentation of strong connectivity for the Pacific Flyway populations (UT and ID).

3. Improving wing-tag re-sight rates using citizen science (UT). Utah Division of Wildlife Resources is working with NGOs and academics to recruit, train, and deploy citizen scientists to improve re-sight rates for wing-tagged pelicans around the Great Salt Lake and other important wetlands. This will improve survivorship estimate precision over time.

4. Capturing adult pelicans (Utah) to mount solar-powered GPS and GSM transmitters (68 to date, five on-air as of August 2019) to:
   a. Identify breeding, foraging, migration stopover, and wintering habitats;
   b. Identify migration pathways;
   c. Describe local and regional breeding season movements;
   d. Identify management and conservation partners with influence over crucial landscapes; and
e. Improve airport airspace security.

5. Refining the publicly accessible online pelican map (https://wildlife.utah.gov/pelican_webmap/) to include spatial analysis tools (‘dashboards’) useful for bird movement data by porting the custom application to a fully supported platform.

6. Leveraging valuable colony count and movement datasets by adding graduate student opportunities using the pelican movement data (UT/ID, 2018). To date, two MA and one PhD positions have been funded and are in progress (USU and BYU).

7. Initiated a full-life cycle survivorship analysis, using a combination of long-term colony counts and banding returns (UT).

8. Improved tag re-sighting rates by implementing targeted citizen science surveys in Utah (2017-2020).

9. Mounted solar-powered GPS/GSM transmitters on 25 pelicans in Idaho that are foraging on a fish population of concern, to determine local movements and habitat use. Results will be used to further refine management activities. As these transmitters will be in use year-round, these data are also contributing to regional movement knowledge gained by efforts in Utah described above.
**Planned Work.**

1. Provide input and direction to the analysis of pelican monitoring and movement data by associated graduate students to maximize management value for the Pacific Flyway.

2. Add 10 additional GSM transmitters per year through 2023 to describe pelican movements between years and in further detail (UT).

**Table 1. American white pelican colony count data, western population, 2014-2018.**

<table>
<thead>
<tr>
<th>Colony Name</th>
<th>State</th>
<th>2014 Estimated Breeding Individuals (% annual total)</th>
<th>2017 Estimated Breeding Individuals (% annual total)</th>
<th>2018 Estimated Breeding Individuals (% annual total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaho Island NWR</td>
<td>NV</td>
<td>16,224 (38.0)</td>
<td>20,860 (45.3)</td>
<td>19,000 (39.3)</td>
</tr>
<tr>
<td>Gunnison Island WMA</td>
<td>UT</td>
<td>9,428 (22.1)</td>
<td>8,342 (18.1)</td>
<td>10,644 (22.0)</td>
</tr>
<tr>
<td>Minidoka NWR</td>
<td>ID</td>
<td>4,264 (10.0)</td>
<td>2,118 (4.6)</td>
<td>3,676 (7.6)</td>
</tr>
<tr>
<td>Badger Island, McNary NWR</td>
<td>WA</td>
<td>3,670 (8.6)</td>
<td>3,770 (8.2)</td>
<td>5,616 (11.6)</td>
</tr>
<tr>
<td>Canyon Ferry WMA</td>
<td>MT</td>
<td>3,432 (8.0)</td>
<td>3,276 (7.1)</td>
<td>3,286 (6.8)</td>
</tr>
<tr>
<td>Blackfoot Reservoir</td>
<td>ID</td>
<td>2,096 (4.9)</td>
<td>1,232 (2.7)</td>
<td>1,416 (2.9)</td>
</tr>
<tr>
<td>Malheur NWR</td>
<td>OR</td>
<td>656 (1.5)</td>
<td>0 (0.0)</td>
<td>72 (0.1)</td>
</tr>
<tr>
<td>Molly Lake, Yellowstone NP</td>
<td>WY</td>
<td>614 (1.4)</td>
<td>560 (1.2)</td>
<td>394 (0.8)</td>
</tr>
<tr>
<td>Stum Lake</td>
<td>BC</td>
<td>590 (1.4)</td>
<td>77 (0.2)</td>
<td>88 (0.2)</td>
</tr>
<tr>
<td>Clear Lake NWR</td>
<td>CA</td>
<td>444 (1.0)</td>
<td>868 (1.9)</td>
<td>584 (1.2)</td>
</tr>
<tr>
<td>Miller Sand</td>
<td>OR</td>
<td>366 (0.9)</td>
<td>204 (0.4)</td>
<td>398 (0.8)</td>
</tr>
<tr>
<td>Spit/Rice Island</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper Klamath NWR</td>
<td>OR</td>
<td>348 (0.8)</td>
<td>466 (1.0)</td>
<td>385 (0.8)</td>
</tr>
<tr>
<td>Island Park Reservoir</td>
<td>ID</td>
<td>326 (0.8)</td>
<td>1,650 (3.6)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Arod Lake</td>
<td>MT</td>
<td>234 (0.5)</td>
<td>332 (0.7)</td>
<td></td>
</tr>
<tr>
<td>Lower Klamath NWR</td>
<td>CA</td>
<td>0 (0.0)</td>
<td>466 (1.0)</td>
<td>542 (1.1)</td>
</tr>
<tr>
<td>Crump Lake</td>
<td>OR</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Pelican Lake</td>
<td>OR</td>
<td>0 (0.0)</td>
<td>674 (1.5)</td>
<td>433 (0.9)</td>
</tr>
<tr>
<td>Ruby Lake NWR</td>
<td>NV</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td></td>
</tr>
<tr>
<td>Neponset Reservoir</td>
<td>UT</td>
<td>--</td>
<td>916 (2.0)</td>
<td>50 (0.1)</td>
</tr>
<tr>
<td>Punzi Lake</td>
<td>BC</td>
<td>--</td>
<td>232 (0.5)</td>
<td>592 (1.2)</td>
</tr>
<tr>
<td>Unnamed Island, Padilla</td>
<td>WA</td>
<td>--</td>
<td>36 (0.1)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Fairchild Swamp</td>
<td>CA</td>
<td>--</td>
<td>--</td>
<td>1,128 (2.3)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>42,692</strong></td>
<td><strong>46,083</strong></td>
<td><strong>48,304</strong></td>
</tr>
</tbody>
</table>

*aNew colony first observed in 2018.*
Figure 1. Western population of American white pelican colony locations, approximate sizes, and current activity in the Pacific Flyway.
Double-Crested Cormorant Subcommittee
Joe Buchanan, Washington
Michelle McDowell, U.S. Fish and Wildlife Service
Colleen Moulton, Idaho
Martin Nugent, Oregon

2018 Summary - Double-crested Cormorant Western Population Status Evaluation, U.S. Army Corps of Engineers

Background
The U.S. Army Corps of Engineers (Corps) developed the Double-crested Cormorant Management Plan and Final Environmental Impact Statement (FEIS) (Corps 2015) to comply with reasonable and prudent alternative action (RPA) 46 in the 2008 Federal Columbia River Power System Biological Opinion, and its 2010 and 2014 supplements, issued by National Marine Fisheries Services. Reasonable and prudent alternative 46 in the 2014 Supplemental Federal Columbia River Power System Biological Opinion called for the Corps to “…develop a cormorant management plan (including necessary monitoring and research) and implement warranted actions to reduce cormorant predation in the estuary to Base Period levels (no more than 5,380 to 5,939 nesting pairs on East Sand Island).” The Corps selected Alternative C-1 from the FEIS, which includes coordination with the U.S. Fish and Wildlife Service (Service) and states to implement the Pacific Flyway Council (PFC) Monitoring Strategy (PFC 2013) annually through 2019.

Corps funding was used to survey sites where other PFC Partners would not have otherwise collected data in 2015, 2016 and 2018. The Corps is currently conducting their fourth and final survey in 2019.

2018 Strategy Implementation
Surveys were completed, at minimum once per site, to estimate peak number of breeding double-crested cormorants, through nest and adult counts, March through August. The Service and its contractors, PFC partners, and Corps contractors monitored colony sites or colony complexes (i.e., collection of closely associated colonies) in 2018. The Service assembled and processed all 2018 colony information and derived a 2018 estimate of the western population as described in the PFC Monitoring Strategy. This annual estimate was compared to the Double-crested Cormorant Western Population Model prediction (FEIS, Corps 2015).

For each year, sites were selected for monitoring and additional data for colony sites and colony complexes were contributed by partners and used in the analysis. All Columbia River Estuary sites monitored were included in these analyzes; the data were contributed by the Corps.

Results
In 2018, 43 sites were monitored of the 46 selected. Arod Lakes in Montana, and two colony sites in interior California were not monitored. An additional 78 sites were also surveyed for a total of 121 colony sites or colony complexes monitored and analyzed (Table 1). Two new breeding colonies were detected, Puloma Ranch Pond in Arizona and Seaside Trees in Oregon.

The 2018 estimate was higher than the 2017 estimate, but lower than the 2016 estimate (Table 2). There was little evidence of a difference in breeding population size comparing 2014-2016 and 2018 data. As predicted, following the significant drop in estimated population size from 2016 to 2017, the population rebounded in 2018.
Table 1. Numbers of colony sites or colony complexes selected for monitoring and total monitored and analyzed according to methods in the PFC Monitoring Strategy; this includes data contributed from partners.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of sites selected</th>
<th>Total number monitored and analyzed</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>46</td>
<td>121</td>
</tr>
<tr>
<td>2017</td>
<td>46</td>
<td>124</td>
</tr>
<tr>
<td>2016</td>
<td>46</td>
<td>110</td>
</tr>
<tr>
<td>2015</td>
<td>46</td>
<td>123</td>
</tr>
<tr>
<td>2014</td>
<td>44</td>
<td>115</td>
</tr>
</tbody>
</table>

Table 2. Double-crested Cormorant western population estimates for 2014–2018.

<table>
<thead>
<tr>
<th>Year</th>
<th>Population Estimate</th>
<th>Standard Error</th>
<th>Estimated LCL</th>
<th>Estimated UCL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pairs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>30,814</td>
<td>2,895</td>
<td>25,141</td>
<td>36,488</td>
</tr>
<tr>
<td></td>
<td>Individuals</td>
<td>61,629</td>
<td>50,281</td>
<td>72,976</td>
</tr>
<tr>
<td>*2017</td>
<td>22,164</td>
<td>1,654</td>
<td>18,921</td>
<td>25,406</td>
</tr>
<tr>
<td></td>
<td>Individuals</td>
<td>44,327</td>
<td>37,842</td>
<td>50,812</td>
</tr>
<tr>
<td>2016</td>
<td>37,454</td>
<td>3,010</td>
<td>31,555</td>
<td>43,353</td>
</tr>
<tr>
<td></td>
<td>Individuals</td>
<td>74,908</td>
<td>63,110</td>
<td>86,705</td>
</tr>
<tr>
<td>2015</td>
<td>37,301</td>
<td>2,127</td>
<td>33,132</td>
<td>41,469</td>
</tr>
<tr>
<td></td>
<td>Individuals</td>
<td>74,601</td>
<td>66,265</td>
<td>82,938</td>
</tr>
<tr>
<td>2014</td>
<td>36,719</td>
<td>1,611</td>
<td>33,562</td>
<td>39,875</td>
</tr>
<tr>
<td></td>
<td>Individuals</td>
<td>73,437</td>
<td>67,124</td>
<td>79,751</td>
</tr>
</tbody>
</table>

*Significantly different from all other years, p<0.01

Discussion
The strength in using the PFC Monitoring Strategy was the ability to detect change from 2014 forward. Monitoring methods were standardized for the first time, and a sampling approach was used that does not require monitoring all colonies.

The 2017 breeding pair estimate of the western population was statistically lower than the other survey years (Table 2). The colony with the largest decrease in nesting was East Sand Island. In 2017, the peak breeding abundance was only 544 pairs, compared to 13,626 breeding pairs in 2014. The nearby Astoria-Megler Bridge hosted the largest colony in the western population in 2017 (834 pairs). A combination of factors likely led to multiple dispersal events and extremely low breeding abundance of cormorants on the East Sand Island colony in 2017. These factors included: 1) unusually high disturbance and predation by bald eagles, 2) high flows in the Columbia River that may have reduced the prey available to cormorants during the breeding season, and 3) potential carry-over effects from past breeding seasons (Turecek et al. 2018). Prior to management, the large size of the East Sand Island colony likely provided security, “swamping” bald eagles, reducing the effects of disturbance and predation (Anderson and Hodum 1993, Peck-Richardson 2017). Late breeding and late departure from colonies can lead to low nesting success in subsequent years (Fayet et. al. 2016), and repeated nesting attempts, late nesting, and late departure from the breeding site were observed for 2016, 2017, and 2018 (Turecek et al. 2018, Turecek et al. 2019). Reducing productivity was part of implementation of the Corps’ Double-crested Cormorant management plan to reduce predation of juvenile salmonids in the Columbia River Estuary (e.g. nest destruction through egg oiling; active culling of adults on/near East Sand Island during the incubation period). Active management at East Sand Island was another potential factor for the low breeding colony abundance in 2017, but management occurred at substantially lower levels.
than in previous years, and at levels below those identified in the management plan. Approximately 16,000 total cormorants were observed on East Sand Island in 2017, and thousands used the Astoria-Megler Bridge for roosting throughout the breeding season, but the vast majority did not nest. These nonbreeders are not included in the western population estimate of breeding pairs, which is the metric for this study. Metrics important to stakeholders may not match with the primary metrics of this survey.

Breeding numbers increased from 2017 to 2018 in the Columbia River Estuary; presumably a result of many of the non-breeders observed in 2017 returning. In 2018, the East Sand Island colony was the largest in the western population; the Astoria-Megler Bridge colony was the second largest with 1,736 breeding pairs (Turecek et al. 2019). The 2018 western population estimate was larger than predicted in the FEIS (Corps 2015). This study addresses the fourth adaptive management goal, “Minimize adverse impacts to the western population of DCCO” (Corps 2015); this goal is currently being achieved.

**Future Monitoring Plans**

The PFC Monitoring Strategy (2013) states that implementation will occur every third year and thereafter for at least 10 years. The future survey years are 2020 and 2023. Data collected during other years can augment analyses, but the goal is to conduct a comprehensive, standardized monitoring effort during the years specified. The Corps will continue to support surveys on East Sand Island and navigational aids in the lower Columbia River Estuary for 2020 and 2021.

**References**


Off-cycle Products
(Approved since March 6, 2019)

Recommendation
The Pacific Flyway Council (Council) endorse the attached letter to be sent with the Western Association of Fish and Wildlife Agencies’ (WAFWA) Competitive State Wildlife Grant proposal Assessing Habitat Occupancy for the Western Distinct Population Segment of the Yellow-billed Cuckoo.

Justification
The federal listing of the western yellow-billed cuckoo has drawn attention to a lack of knowledge on the species’ current population status and distribution. To address this information gap, the state wildlife agencies began collaborating on a proposal for Competitive State Wildlife Grant Funds in 2015. The Arizona Game and Fish Department, as the lead state agency for the Pacific Flyway, has coordinated with all state wildlife agencies within the Pacific Flyway, and WAFWA plans to submit a proposal on behalf of participating states. This letter will inform the U.S. Fish and Wildlife Service’s Wildlife and Sportfish Restoration Program of the Pacific Flyway Council’s support for this valuable effort.

Adoption
Pacific Flyway Nongame Technical Committee
July 5, 2019

Contact: Jamey Driscoll

Neil Clipperton, Chair

Adoption
Pacific Flyway Council
July 12, 2019

Kevin Blakely, Chair
July 10, 2019

Paul Van Ryzin
U.S. Fish and Wildlife Service
Wildlife and Sport Fish Restoration Program
Mailstop: WSFR
5275 Leesburg Pike
Falls Church, VA 22041-3803

Dear Mr. Van Ryzin,

The Pacific Flyway Council (Council) supports and endorses the Western Association of Fish and Wildlife Agencies’ (WAFWA) Competitive State Wildlife Grant proposal for Assessing Habitat Occupancy for the Western Distinct Population Segment of the Yellow-billed Cuckoo (Coccyzus americanus). The Arizona Game and Fish Department, as the lead state agency for the proposal, has coordinated with 12 state wildlife agencies including those of the Pacific Flyway, and WAFWA plans to submit a proposal on behalf of participating states.

All 12 states (Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Texas, Utah, Washington, and Wyoming) have recognized the yellow-billed cuckoo as a Species of Greatest Conservation Need. The states’ Wildlife Action Plans identify data needs and management actions to advance conservation of this federally listed species. However, the lack of knowledge on the species’ current distribution is an impediment to evaluating conservation concerns, and inhibits targeted on-the-ground conservation.

To address this information gap, the state wildlife agencies began collaborating on a proposal for Competitive State Wildlife Grant Funds in 2015. The states are pursuing this grant to implement the following objectives: 1) develop a western DPS range-wide Species Distribution Model, 2) Implement a western DPS range-wide survey, and 3) Investigate use of Autonomous Recording Units as an alternate survey method.

We strongly endorse the objectives of the proposal. We believe the information gathered through the implementation of this project will address some of the information gaps that currently hinder conservation and recovery of this species.

Sincerely,

Kevin Blakely, Chair
Pacific Flyway Council