THE AUDUBON ALASKA WATCHLIST 2017
TECHNICAL REPORT

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INTRODUCTION

The 2017 Alaska WatchList 2017 is intended as a tool to identify and focus conservation attention on vulnerable and declining bird species in Alaska. This WatchList builds on two other Alaska WatchLists' efforts, Stenhouse and Senner (2005) and Kirchhoff and Padula (2010), using updated data and slightly different scoring methods. This technical report provides detail on methods used in development of the Alaska WatchList 2017, including scoring criteria and thresholds. With appropriate conservation actions, we hope to ensure the continued existence and enhanced abundance of all birds in Alaska. The Alaska WatchList 2017 is aimed at helping those efforts.

Eligible birds. We limited our evaluation to birds that regularly occur in Alaska. We omitted those species classified as rare (annual or possibly annual in small numbers (<1,000) at the perimeter of Alaska), casual (not annual, beyond the perimeter of their range), and accidental (one or two Alaska records) (Gibson et al. 2008). There are over 100 subspecies of birds in Alaska (Gibson and Kessel 1997), as well as a number of populations that are geographically distinct and are monitored and managed separately (especially waterfowl). Many of the subspecies are endemic to small groups of islands within the Bering Sea, the Aleutian Islands, the Kodiak Archipelago, and the Alexander Archipelago. Among others, there are five subspecies of Rock Ptarmigan (*Lagopus muta*), seven subspecies of Song Sparrow (*Melospiza melodia*), seven subspecies of Fox Sparrow (*Passarella iliaca*), seven subspecies of Winter Wren (*Troglodytes troglodytes*), and four subspecies of Gray-crowned Rosy-Finch (*Leucosticte tephrocotis*) (Gibson and Kessel 1997). Most of these subspecies were described by taxonomists in the late 19th and early 20th centuries, are fairly obscure, and little is known of population sizes and trends. As a result, based on our scoring method, most of these subspecies end up on our

Yellow List due to their small range size, large stewardship score, and unknown population trend score. Whether they deserve special management action should be decided on a case-by-case basis.

Thresholds for listing. To appear on the Alaska WatchList, a species must get a minimum of 20 points from our scoring criteria (see below). Species or subspecies that qualify for the WatchList that have a declining or depressed population trend (PT $\geq$ 4 points) appear on the Red List. Non-declining species (PT score $\leq$3 points) scoring $\geq$ 20 points are deemed vulnerable; these are the Yellow List species.

Common but declining populations - Some species scored less than 20 points (and therefore are not on the Red or Yellow List) but are declining (PT $\geq$ 4 points). Most of these species are relatively common ones (large population sizes but relatively small percentage of the population in Alaska), and they still merit close attention. Thus, in 2017 we have also included a table showing common but declining species of Alaska. Our methods for scoring follow.

METHODS

As with past WatchLists, for the 2017 WatchList, we scored birds based on four criteria:

1) Global population size;
2) Limiting seasonal range (when population is most concentrated);
3) Area importance/Stewardship (percent of global population occurring in Alaska);
4) Population trend (weighted x 3).

1) Global population size. The larger the population size, the lower its risk of extinction. Disease, weather, predation, and catastrophic events (e.g., oil spills, volcanic eruptions) can all have a disproportionate impacts on small populations. For the majority of species, estimates of global population size came from the BirdLife International Data Zone; Partners in Flight (mainly landbirds); Wetlands International (waterbirds), Brad Andres, the USFWS National Coordinator for the US Shorebird Conservation Plan (shorebirds) (see references below); and from individual studies of particular species. Deviating slightly from the scores used by Kirchhoff and Padula (2010), and to facilitate comparisons among other commonly used bird ranking efforts, we scored global population size from 1-5 following Partners in Flight and the

US Shorebird Conservation Plan scoring criteria. A high score (5 points) indicated a population size of less than 50,000 individuals. A low score (1 point) indicated a population greater or equal to 50,000,000 individuals (Table 1). If population size was unknown, we gave it a score of 3.

Score	Criteria
1	≥50,000,000 individuals
2	<50,000,000 and ≥5,000,000 individuals
3	<5,000,000 and ≥500,000 individuals (or unknown)
4	<500,000 and ≥50,000 individuals
5	<50,000 individuals

Table 1. Global population size.

2) *Minimum range size*. As with population size, small range sizes also confer greater risk on a population. We scored each bird based on the season when the global population was most concentrated (breeding, nonbreeding, migration). Deviating slightly from the scores used by Kirchhoff and Padula (2010), and to facilitate comparisons among other common bird ranking efforts we scored global population size from 1-5, using the same ranking criteria as Partners in Flight and the US Shorebird Conservation Plan (Table 2). A high score (5 points) indicated a range size of less than 80,000 km^2. A low score (1 point) was given to birds that had a range size of more than 4,000,000 km^2 (Table 2). If minimum range size was unknown, we gave it a score of 3.

For the majority of species, estimates of minimum range size were taken from the BirdLife International Data Zone, the Partners in Flight database for North American landbirds, and to a lesser extent, individual studies and expert opinion. Most of these scores remained unchanged from Kirchhoff and Padula (2010), unless more up-to-date information was found (e.g. Partners in Flight data). For some colonial seabird species that breed on a handful of colonies, like albatross and Red-legged Kittiwake (*Rissa brevirostris*), we felt risk was better represented by the approximate colony area, rather than the at-sea distribution. For species where more than 95% of the population breeds at five or fewer colonies, we assigned a high vulnerability score of 5. We also departed from standard range estimates when we had

knowledge that a high proportion of the population could be found in a smaller areas at some time during the annual season (e.g., Spectacled Eider, *Somateria fischeri*, and Pacific Black Brant, *Branta bernicla nigricans*). In these cases, the range size risk factor was given a score of 5 (high). Where we were unable to locate range data (including many subspecies), we either estimated the range or gave a range score of 3 for unknown.

Score	Criterion
1	≥4,000,000 km^2
2	≥1,000,000 and <4,000,000 km^2
3	≥300,000 and <1,000,000 km^2 (or unknown)
4	≥80,000 and <300,000 km^2
5	<80,000 km^2

Table 2. Minimum range size.

3) *Area/Stewardship importance*. Because this is a WatchList for Alaska birds, we gave added weight to those birds which are particularly dependant on Alaska. We gave the highest score (5 points) to birds when more than 70% of the global population could be found in Alaska at any point in time (Table 3). We gave the lowest score (1 point) to species or subspecies when less than 10% of the population could be expected to occur in Alaska. Given that these scores have potentially changed significantly since the 2010 WatchList, we relied heavily on the latest individual studies of particular species, if available. In addition, we used statewide landbird Alaska population estimates from the Partners in Flight online database (PIF 2016), and additional sources for groups of birds including for seabirds (e.g., Denlinger 2006, Dragoo et al. 2017), shorebirds (Andres 2016), and waterfowl (e.g., Platte and Stehn 2013, USFWS 2016). Where no statewide population estimate was available, we assigned the score based on the approximate proportion of the species' North American range occurring in Alaska, or gave it a score of 3 for unknown.

Score	Criterion
1	<10
2	10 to <25
3	25to <50 (or unknown)
4	50 to <70
5	>70

Table 3. Area importance/Stewardship.

4) *Population trend*. Population trend is a good indicator of the condition or status of a given species, and as a consequence half the potential points a bird can score come from its weighted (x 3) trend score. Birds experiencing large, biologically significant declines received the highest score (5 x 3 = 15 points). Species with increasing populations received the fewest points (1 x 3 = 3 points) (Table 4). In some cases, birds could be increasing but still exist at levels far below historical (last 30 years) numbers; we classified these species as depressed, and assigned a trend value of 4 x 3 = 12 points (Table 4). We used population trend data from a variety of sources including from Breeding Bird Surveys, Audubon Christmas Bird Count data for Alaska, BirdLife International, Alaska Landbird Monitoring Survey, various species group (e.g. Bowman et al. 2015) or region specific efforts (e.g. Platte and Stehn 2013, see other references below) , and single species efforts. Trend scores often vary regionally by species (for instance, Rusty Blackbird populations are severely depressed, but declines appear to be mainly in the eastern North America vs. the western population that appears to be stable), so when trend scores varied for a species in different directions, we gave preference to trends calculated in Alaska or for the population of birds found in Alaska

Score	Criterion
1	Large, biologically significant increase
2	Apparently increasing, or stable
3	Variable trend (or unknown)
4	Apparently declining or depressed from former decline

5	Large, biologically significant decline

Table 4. Population trend (weighted x 3).

For further discussion of how we ranked species and justification of the weighting scheme we used for this WatchList see Kirchhoff and Padula (2010). A summary of the population and range sizes, trends, criteria scores, and information sources for the species we scored is available in an Excel spreadsheet from N. Warnock (907-276-7034 or nwarnock@audubon.org).

DISCUSSION AND RECOMMENDATIONS

(Copied and modified from Kirchhoff and Padula (2010))

Like previous efforts, our goal was to develop an objective, data-driven process for selecting birds to include on the Alaska WatchList 2017. Challenges arose in this task, and for the benefit of those who build upon this effort in the future, we discuss some of them below.

A purely data-driven approach is limited by the amount and quality of data available. We were unable to find data on range size and population size for a number of species and subspecies, and in those cases were forced to estimate the correct category for scoring (these values are given a source code of E for expert opinion in the Excel data base). Even where estimates exist, they may have low confidence (e.g., Thogmartin et al. 2006). Trend information accuracy varies as well, and it is heavily tilted towards the lower 48 states, especially for non-harvested species. In Alaska, where there are relatively few Breeding Bird Survey routes and limited Christmas Bird Count data, the confidence intervals around estimates of population size and trend tend to be greater than in the Lower 48. The Alaska Landbird Monitoring Survey (http://alaska.usgs.gov/science/biology/bpif/monitor/alms.php) is helping provide improved data on population trends, habitat relationships, and the distribution of landbirds in Alaska (e.g. Handel and Sauer 2017). eBird data (http://ebird.org/content/ebird/) are also rapidly expanding our knowledge about the distribution and abundance of birds in Alaska. Bird monitoring efforts by our state and federal agencies should be commended and highest priority should be given to those monitoring programs.

Comparing birds at the species level, subspecies level, and population level creates an inherent imbalance when population size and distribution are factors that place birds on the list. Most species prioritization lists restrict their analysis to the species level, but this can obscure regional differences. In this WatchList we expanded our subspecies list but most of these subspecies lack basic data on things like population size and trend. Even though most of these populations are in remote and relatively untouched areas, this lack of information hinders effective management of the populations.

By design, population trend carries half the weight in our WatchList scoring system. It would be desirable to discriminate between large declines and moderate declines, and within each, whether the decline is certain or uncertain. And if populations are depressed but recovering, how depressed are they, and what is the prognosis for recovery? We felt some populations which are rebounding slowly from former depressed states (e.g., Emperor Goose, Spectacled Eider) should be rated differently than species that are stable and near all-time highs. In such cases, we assigned higher scores to reflect their recovering status. However, we lacked the necessary historic data to do this systematically and comprehensively for all species. A future effort might consider making such decision rules more explicit, and allowing for more categories (e.g., 7 categories) for assigning points to trend.

For many colony-nesting birds, the reported size of the breeding range underestimates their true vulnerability. For example, Cassin's Auklets range from the western Aleutians to California, but more than one third nest in a single colony. Red-legged Kittiwakes (*Rissa brevirostris*) nest at just five or six locations in the world, with 80% in a single location; however, because minor colonies are widespread, the species' reported breeding range is 14,000,000 km^2. This understates vulnerability. For a handful of species, we increased the range score when the reported range did not accurately reflect vulnerability. Future efforts should consider a more systematic method for scoring those species that are densely concentrated on breeding colonies, during molt, or in migration.

The database that was compiled for this effort will hopefully provide a foundation for future species prioritization processes. The underlying data will need periodic review and revision to

retain its usefulness. Although the criteria, scoring, and listing rule-sets may change in the future, the process used to generate any given list should be clearly documented and transparent.

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