THE AUDUBON ALASKA WATCHLIST 2010
TECHNICAL REPORT

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INTRODUCTION

The Alaska WatchList 2010 is intended as a tool to identify, and focus conservation attention on, vulnerable and declining bird species in Alaska. This WatchList is a revision of the 2005 edition of the Alaska WatchList (Stenhouse and Senner 2005), using updated data and different scoring methods. The Alaska WatchList 2010 is the state-level equivalent of the National Audubon WatchList, which focuses on a larger suite of North American species (Butcher et al. 2007).

This technical report provides detail on methods used in development of the Alaska WatchList 2010, including scoring criteria, thresholds, and data sources. We report the final list, note important patterns, and compare our results with other efforts that identify species of conservation concern (e.g., USFWS 2008, Alaska Shorebird Group 2008, International Union for the Conservation of Nature 2010). These lists are intended to provide helpful guidance for managers, researchers, and conservationists who must prioritize where they will devote limited time, effort, and money. With appropriate conservation actions, we hope to ensure the continued existence and enhanced abundance of all birds in Alaska. We created the Alaska WatchList 2010 with the aim of helping those efforts.

METHODS

Most efforts to prioritize birds of conservation concern base their analysis on similar sets of criteria, including population size, range size (breeding and nonbreeding), threats (breeding and nonbreeding), population trend, and area importance (e.g., Brown et al. 2001, Kushlan et al. 2002, Rich et al. 2004, Panjabi et al. 2005, Butcher et al. 2007, Alaska Shorebird Group 2008, USFWS 2008). While the assumptions and parameters may be imperfect, they provide a satisfactory means for identifying priorities over large areas for diverse species (Carter et al. 2000, Beissinger et al. 2000, Thogmartin et al. 2006). Among plans, there are differences in which criteria to include, how scores are assigned, and what thresholds and rules to apply. Such decisions are often linked to the scope of the planning effort (e.g., a global, continental, or regional focus), or the taxa covered (e.g., shorebirds versus landbirds). For this WatchList, we scored birds based on four criteria:

1) Global population size
2) Limiting seasonal range (when population is most concentrated)
3) Area importance (percent of global population occurring in Alaska)
4) Population trend (at continental level)

A description of these criteria follows.

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 impact on a small population. We assumed species or subspecies with fewer than 25,000 birds were at highest risk (5 points), and species or subspecies with 1 million or more birds were at lowest risk (1 point) (Table 1). For the majority of species, estimates of global population size were from the BirdLife International Data Zone (BLI 2010). For subspecies estimates, we relied on other sources for waterbirds (Delany and Scott 2006), waterfowl (SDJV 2003, Delany and Scott 2006, USFWS 2009), shorebirds (Alaska Shorebird Group 2008), and seabirds (Kushlan et al. 2002, Denlinger 2006). We also utilized data from recently completed status assessments on individual species, for example, the Dusky Canada Goose (*Branta canadensis occidentalis*) (Bromley and Rothe 2003), Yellow-billed Loon (*Gavia adamsii*) (Earnst 2004), Pacific Common Eider (*Somateria mollissima v-nigra*) (USFWS 2006),

Queen Charlotte Goshawk (*Accipiter gentilis laingi*) (USFWS 2007), and individual waterfowl species (USFWS 2009).

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). A high score (5 points) indicated a range size of less than 17,000 km^2. A low score (1 point) was given to birds that had a range size of more than 850,000 km^2 (Table 1). For the majority of species, estimates of minimum seasonal range size were from the BirdLife International Data Zone (BLI 2010). For some colonial seabird species that breed on a handful of colonies, such as 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 those species where more than 95% of the population breeds on five or fewer colonies, we assigned a high vulnerability score of 5. We also departed from the BirdLife International range estimates when we had knowledge that a high proportion of the population inhabited smaller areas at some time during the annual season (e.g., Spectacled Eider, *Somateria fischeri*, and Pacific Brant, *Branta bernicla nigricans*). In these cases, the range size risk factor was given a score of 5 (high). Where no global ranges were reported (including many subspecies), we estimated the appropriate category based on descriptions of the subspecies or species distribution.

Area importance. Because this is a WatchList for Alaska birds, we gave added weight to those birds that are particularly dependant on Alaska. This can be assessed either on the basis of density, or percentage of the global population that occurs in the area (Panjabi et al. 2005). Both of these methods require an estimate of the population size for the area (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 1). 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. We relied most heavily on statewide population estimates from the Partners in Flight online database (PIF 2007). We used additional Alaska population estimates for seabirds (e.g., Denlinger 2006), shorebirds (e.g., Alaska Shorebird Group 2008), and waterfowl (e.g., Delaney and Scott 2006, USFWS 2009). 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.

Population trend. Population trend is a good indicator of the condition or status of a given species. Birds experiencing large, biologically significant declines received the highest score (15 points). Birds experiencing large increases received the fewest points (3). In some cases birds could be increasing but still exist at levels far below historical (last 30 years) numbers. In these cases, we classified the population as depressed, and assigned a trend value of 12 (Table 1). We derived the North American population trends from the Breeding Bird Survey (Sauer et al. 2005), the Audubon Christmas Bird Count, or a combination of the two (Butcher and Niven 2007). We supplemented these estimates with estimates for waterbirds (Delany and Scott 2006), waterfowl (SDJV 2003, Delany and Scott 2006, USFWS 2009), shorebirds (Alaska Shorebird Group 2008), and seabirds (Kushlan et al. 2002, Denlinger 2006). We also consulted status assessments and survey reports completed by the US Fish and Wildlife Service (USFWS) and US Geological Survey (USGS) for individual species.

Threats. An assessment of relative threats is normally included in North American bird conservation initiatives (e.g., Kushlan et al. 2002, Rich et al. 2004, Butcher et al. 2007, Alaska Shorebird Group 2008). Threats can be current and ongoing, such as land clearing, pollution, recent environmental change, or hunting. The exact magnitude and population effects of these changes, especially outside North America, are poorly known. Threats can also be things that we expect to occur in the future, such as possible oil spills, or predicted climate change. Although threats are important, they lack common currency and are difficult to quantify. For that reason we chose to not incorporate threat assessment scores in our analysis. Instead, we assumed populations threatened by ongoing habitat loss, environmental change, or exploitation (the most commonly cited "threats") will show evidence of that in the population trend data. Sensitivity to future threats should be reflected in the population size and range size scores.

Weighting of factors. Of the factors considered in this analysis, we considered population trend the most important. It directly reflects how a population is faring, and it is relatively easily and objectively measured. It accounted for 15 of 30 possible points (50%) of the final WatchList score. A species' vulnerability was reflected by its population size and range size. These metrics are harder to measure (e.g., Thogmartin et al. 2006), and their relationship to extinction risk is more ambiguous, especially at moderate and higher sizes. These factors together contributed up to 10 points (33%) towards a species' total score. The area-importance of Alaska does not reflect

risk of extinction in any sense, but we wanted to provide some premium to Alaska's stewardship species. This factor contributed a maximum of 5 points (17%), of the total WatchList score.

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 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). Where sufficient data existed to score subspecies and populations, we did so. For the Alaska WatchList 2010, we assigned scores to 222 species, 69 subspecies, and 8 distinct populations of regularly occurring birds in Alaska.

Island endemics. Alaska has numerous subspecies that 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. Rather than include all island endemics on the WatchList, we selected examples from the prior Alaska WatchList (Stenhouse and Senner 2005) for scoring.

Thresholds for listing. Species or subspecies scoring 20 points or more were assigned to the WatchList. Within that group, if the population was declining ($\geq$ 12 points for trend score), we assigned it to the Red List. If the population was not declining, we placed it on the Yellow List. To validate our WatchList, we compared it with other lists, including the prior Alaska WatchList (Stenhouse and Senner 2005), the National Audubon WatchList (Butcher et al. 2007), the International Union for the Conservation of Nature Red List (IUCN 2010), the list of Birds of Conservation Concern in Alaska (USFWS 2008), and the Alaska Shorebird Conservation Plan (Alaska Shorebird Group 2008).

RESULTS

Scoring within each factor. A species becomes more vulnerable as population size and range size diminish. Figures 1–4 show the distribution of species and subspecies by criteria score. As intended, more species merit low scores (low concern), and fewer merit higher scores (higher concern). This reflects the deliberate selection of scoring break points, and the desire to have greater discrimination at the "high risk" end of the spectrum. The exception is the population trend histogram which shows a bell-shaped curve with fewer species at each extreme (large, biologically significant increases or declines) (Figure 4).

Of the 299 species, subspecies, and populations we evaluated, 49, or 16.4%, scored 20 or more points and made the WatchList. Of these, 31 are declining (Red List) and 18 are vulnerable but not known to be declining (Yellow List) (Table 2). At the species level, 29 species (13.1%) were on the WatchList. At the subspecies and population level, 26.1% and 25%, respectively, made the WatchList (Table 2). This partially reflects the fact that birds at higher taxonomic levels (subspecies and populations) have smaller population sizes and more restricted geographic ranges than full species, and thus score higher on vulnerability criteria.

Waterbirds and shorebirds are at significantly greater risk than landbirds (Table 3). This partly reflects more subspecies being evaluated in the former group, and it also reflects a higher proportion of declining populations. Of all bird groups, shorebirds appear most vulnerable, with slightly more than one third of the species and subspecies evaluated making the WatchList. In comparison, 8.3% of the landbirds (a much larger grouping of species) made the WatchList (Table 3).

Of birds making the WatchList, most were in the lower-risk range, with fewer species/subspecies at the higher risk end of the spectrum (Figure 5). The highest scoring bird was the Dusky Canada Goose. This bird has a small population that is steadily declining. They breed exclusively on the Copper River Delta and Middleton Island. The other two birds represented in the highest-score category (26 points or more) were the Kittlitz's Murrelet (*Brachyramphus brevirostris*) that is associated with tidewater glaciers, and a subspecies of Rock Sandpiper (*Calidris ptilocnemis ptilocnemis*) that breeds on Bering Sea islands and overwinters along Cook Inlet. See Table 4 for

a list of all the species on the 2010 WatchList, along with pertinent population and trend data.

Despite using quite different methods, agreement between the Alaska WatchList 2010 and the 2005 Alaska WatchList (Stenhouse and Senner 2005) was high. The new Alaska WatchList adds five birds and removes seven from the prior WatchList (Table 5). The International Union for the Conservation of Nature (IUCN) lists 13 Alaska species as threatened or near-threatened. The Alaska WatchList includes 11 of those, omitting the Sooty Shearwater (*Puffinus griseus*) and Laysan Albatross (*Phoebastria immutabilis*). The Alaska WatchList picks up 19 of 20 "high concern" birds identified in the Alaska Shorebird Plan, omitting the Western Sandpiper (*Calidris mauri*). The Alaska WatchList includes 27 out of 33 of the Birds of Conservation Concern (BCC) in Alaska (USFWS 2008). It does not identify the Horned Grebe (*Podiceps auritus*), Laysan Albatross, Pelagic Cormorant (*Phalocrocorax pelagicus*), Peregrine Falcon (*Falco peregrinus*), Arctic Tern (*Sterna paradisaea*), and Rufous Hummingbird (*Selasphorus rufus*). The Alaska Seabird Information Series (Denlinger 2006) identified two species of high concern that were not on either the Alaska WatchList or the BCC list. They are the Ancient Murrelet (*Synthliboramphus antiquus*) and the Cassin's Auklet (*Ptychoramphus aleuticus*).

A summary of the population and range sizes, trends, criteria scores, and information sources for all regularly occurring species, subspecies, and distinct populations in Alaska is available in an Excel spreadsheet from M. Kirchhoff (907-276-7034 or mkirchhoff@audubon.org).

DISCUSSION AND RECOMMENDATIONS

Our goal was to develop an objective, data-driven process for selecting birds to include on the Alaska WatchList 2010. This proved to be a more difficult task than expected. For the benefit of those who build upon this effort in the future, we note some of the problems encountered and suggest options that might be considered in the future.

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 appear in bold in the Excel spreadsheet). Even where estimates exist, they may have low confidence (e.g.,

Thogmartin et al. 2006). Trend information is better, but it is still 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 uncertainty over population size and trend is greater than in the Lower 48. The Alaska Landbird Monitoring Survey (http://alaska.usgs.gov/science/biology/bpif/monitor/alms.php) will soon provide improved data on population trends, habitat relationships, and the distribution of landbirds in Alaska. These data should be incorporated in future evaluations as they become available.

There should be allowance for expert opinion in the assignment of scores and the composition of the WatchList. One way of doing this is to include threat scores, which by their nature involve some qualitative assessment. An alternative is to invite professional input after scoring is done. We prefer the process prescribed by the US Fish and Wildlife Service (2008:10) in their rule set for identifying Birds of Conservation Concern: "In very limited circumstances, add or remove species (and document rationale) when Service expertise, supplemental information, or local data indicates a much greater or lesser degree of concern than that reflected by the bird conservation initiative scoring." Future Alaska WatchList efforts should consider convening a panel of experts that provide this final judgment.

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 species. This levels the playing field, but at the cost of excluding important components of avian diversity. In this WatchList we chose a middle-of-the-road approach, evaluating some, but not all, subspecies, depending on what information was available and whether the subspecies were being tracked by managers. In the future, consideration might be given to including all subspecies in the analysis, but scoring and electing the subspecies and the species separately.

By design, population trend carries significant weight in this WatchList. We were constrained, however, by the limited number of scores (5) that could be assigned. For example, 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 not be rated the same or higher 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 historical 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., seven 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. But 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. We wrote this technical report with that in mind.

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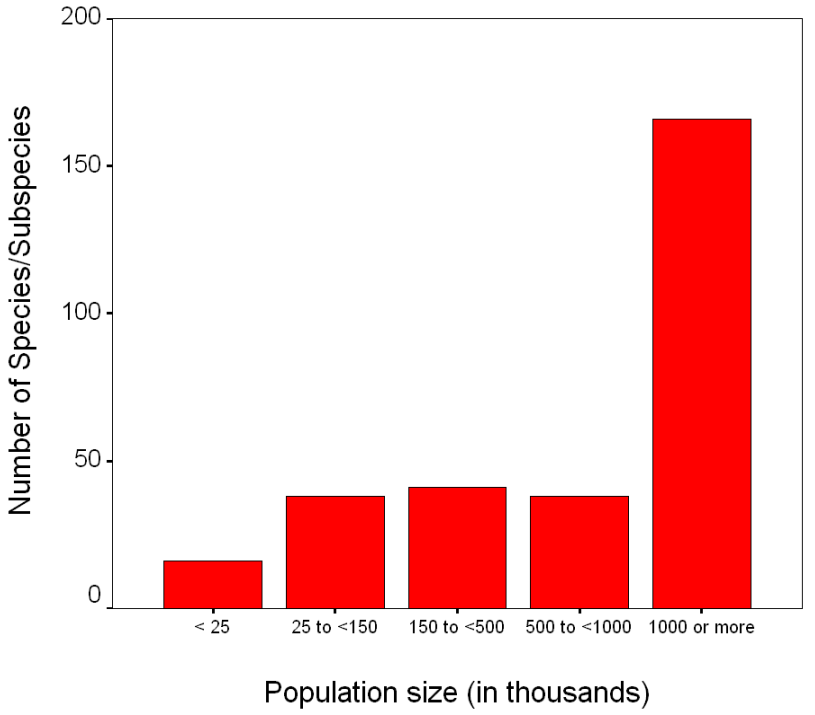
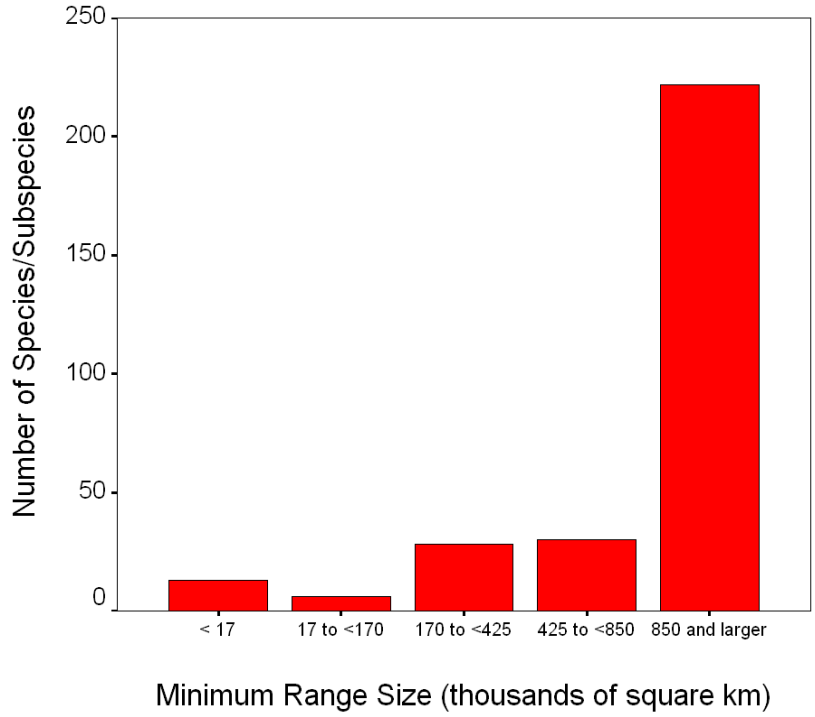
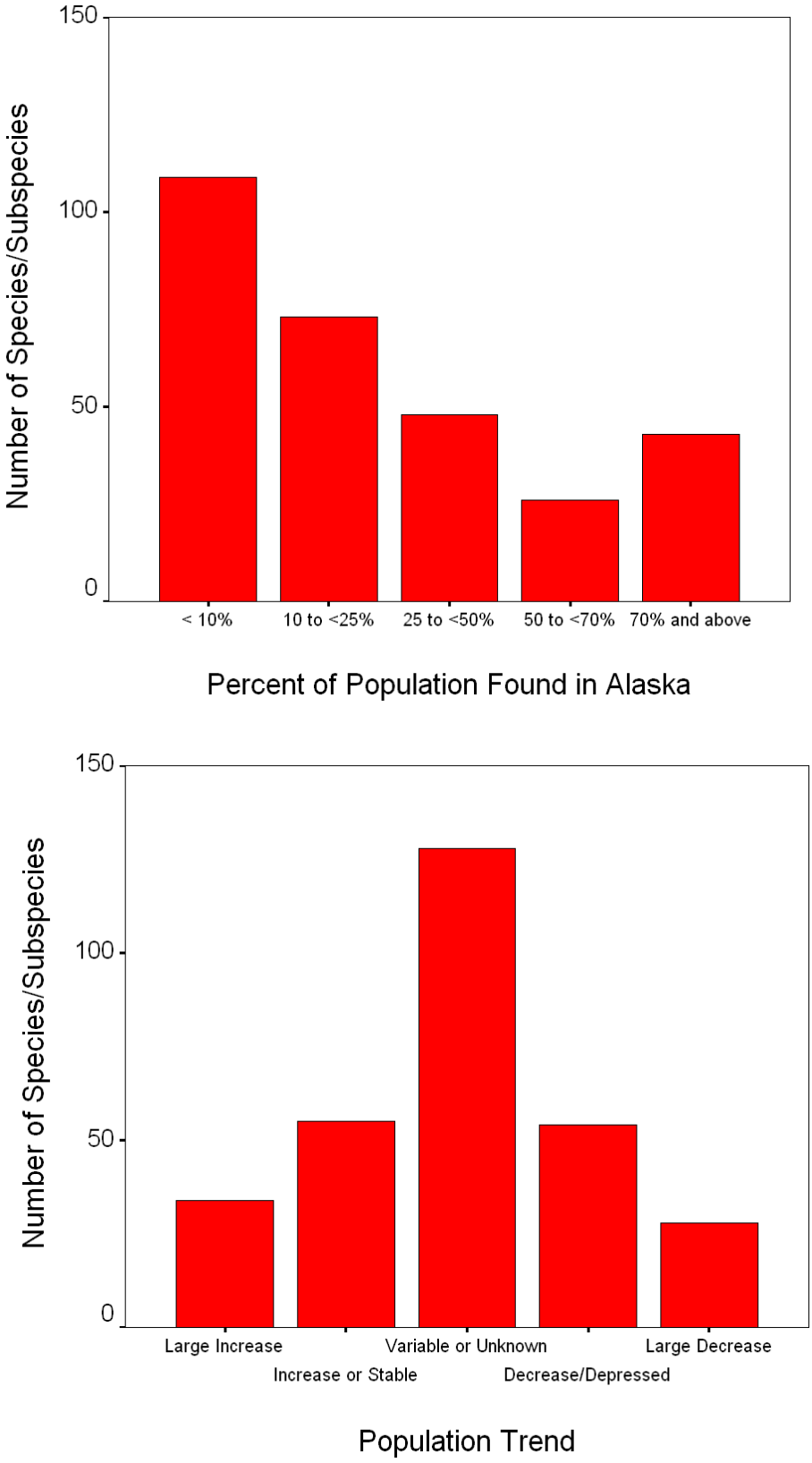
FIGURES





Figures 1 and 2. Figures show the number of Alaska species/subspecies by global population size (top), and limiting range size (bottom). See text for descriptions of criteria and categories.



Figures 3 and 4. Figures show the number of Alaska species/subspecies by area importance (top), and population trend (bottom). See Table 1 and text for descriptions of criteria and categories.

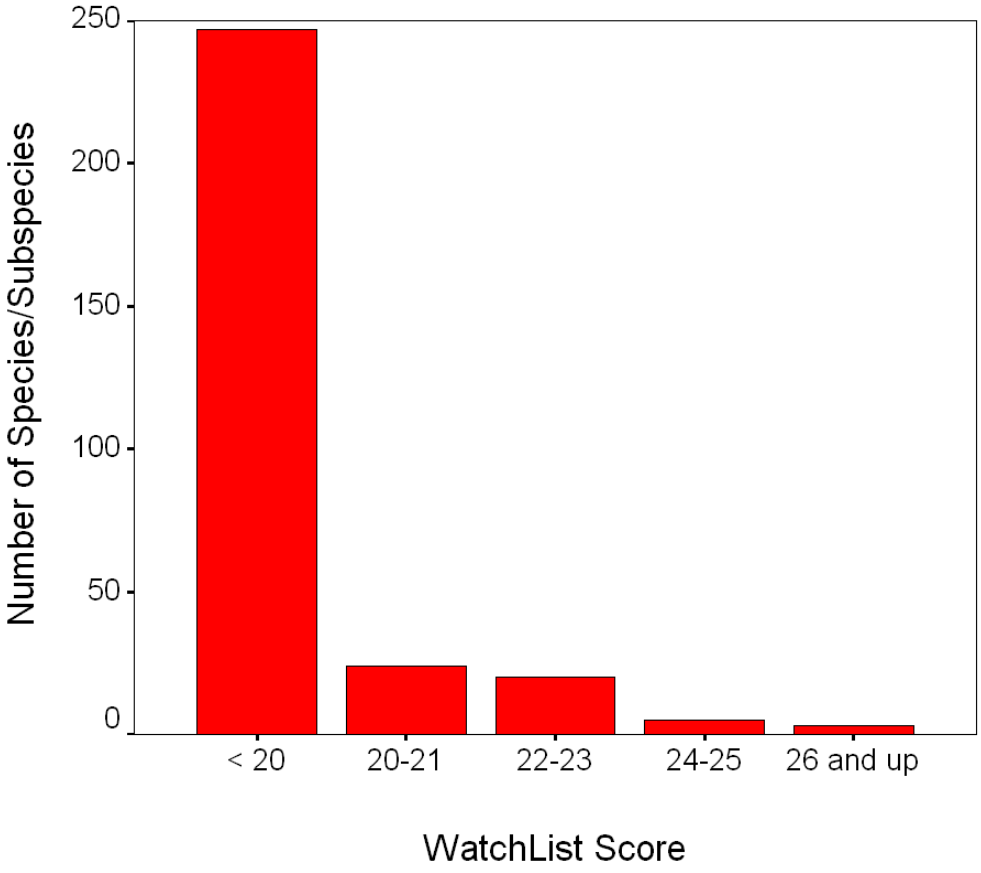


Figure 5. The WatchList score for each species/subspecies is the sum of the scores for population size, minimum range size, area importance, and population trend. Species or subspecies scoring 20 points or higher made the Alaska WatchList 2010.

TABLES

Table 1. Factors used to score species/subspecies on the Alaska WatchList 2010.

Points	Population Size (species, subspecies, or population, whichever is smaller)
5	< 25,000 individuals
4	25,000 to < 150,000 individuals
3	150,000 to < 500,000 individuals
2	500,000 to < 1,000,000 individuals
1	1,000,000 or more individuals

Points	Range Score (Season when population is most concentrated—breeding, nonbreeding, migration)
5	Occupies a very small area (< 17,000 km^2)
4	Occupies a small area (17,000 to < 170,000 km^2)
3	Occupies a moderate area (170,000 to < 425,000 km^2)
2	Occupies a large area (425,000 to < 850,000 km^2)
1	Occupies a very large area (850,000 or more km^2)

Points	Population Trend (across North America)
15	Large, biologically significant decline
12	Apparently declining, or depressed from former decline
9	Unknown or variable trend
6	Apparently increasing, or stable
3	Large, biologically significant increase

Points	Percent of Global Population in Alaska
5	70 and higher
4	50 to < 70
3	25 to < 50
2	10 to < 25
1	< 10

Table 2. Number of species, subspecies, and populations evaluated. Because subspecies and distinct populations have smaller populations and smaller home ranges than full species, their combined scores are relatively higher, and they are disproportionately represented on the WatchList.

Taxonomic Level	Number Evaluated	Number Listed	Percent Listed
Species	222	29	13.1
Subspecies	69	18	26.1
Distinct Populations	8	2	25.0
All Combined	299	49	16.4

Table 3. There are proportionately more waterbirds than landbirds on the WatchList. Shorebirds appear particularly vulnerable, with 34% of species on the WatchList. In contrast, fewer than 10% of landbird species are on the WatchList.

Taxonomic Group	Number Evaluated	Number Listed	Percent Listed
Waterfowl (swans, geese, ducks)	58	10	17.2
Shorebirds (plovers, oystercatchers, sandpipers)	53	18	34.0
Seabirds (jaegers, gulls, terns, procellarids, alcids)	51	8	15.7
Other waterbirds (loons, grebes, herons, cormorants)	16	3	18.8
Landbirds (raptors, grouse, ptarmigan, perching birds)	121	10	8.3

Table 4. The Alaska WatchList 2010 highlights species, subspecies, and populations with a combined score of 20 or higher (see Table 1 for scoring criteria). The Red List designation (N=31) signifies populations with a depressed or declining trend (score 4 or 5). Yellow List species (N= 8) are non-declining, but vulnerable. For comparison, this table provides global population size, area importance (in Alaska), population status (trend), and other lists that include this species/subspecies. Notes provide a brief summary of natural history information, and possible causes for declines.

Key for abbreviations of other lists:

- Audubon Alaska WatchList 2005 (AA 2005)
- Alaska Seabird Information Series conservation status (high or greater) (USFWS 2006)
- The National Audubon Society WatchList (NAS 2007)
- The US Fish and Wildlife Service Birds of Conservation Concern for the Alaska Region (USFWS 2008)
- Alaska Shorebird Conservation Plan priorities for the Alaska Shorebird Group (ASG 2008)
- The International Union for the Conservation of Nature Red List of threatened and near-threatened species (IUCN 2010)

	Species or Subspecies	Global Population	Percent in Alaska	Population Status	Other Lists	Notes
	LOONS					
	Red-throated Loon *Gavia stellata*	395,000	4	Depressed[1]	AA (2005) USFWS (2008)	This species is the smallest of the loons. The population in Alaska declined substantially between 1977 and 1993, and has not rebounded. Wintering distribution is not well understood.
	Yellow-billed Loon *Gavia adamsii*	24,000	14	Possible Decline	AA (2005) NAS (2007) USFWS (2008)	The largest of the loons, this Arctic-breeding loon is also the rarest. Fall subsistence surveys indicate unsustainable levels of harvest. It has qualified as a candidate for listing under the Endangered Species Act.
	CORMORANTS					
	Red-faced Cormorant *Phalacrocorax urile*	155,000	13	Declining	AA (2005) NAS (2007) USFWS (2006) USFWS (2008)	The largest colonies of this bird are found in the western Aleutians. Surveys are complicated by overlap with other cormorant species, but in colonies where this species is differentiated, significant declines are occurring. Reasons for the decline are unknown.
	WATERFOWL					
	Greater White-fronted Goose (Tule) *Anser albifrons gambelli*	14,000	100	Stable	AA (2005)	The Tule Goose is a large, dark subspecies of the Greater White-fronted Goose. This form breeds along Cook Inlet in Alaska, and it winters in the Sacramento Valley of California. The Tule Goose is one of the least abundant of any goose subspecies, but populations appear stable.
	Canada Goose (Dusky) *Branta canadensis occidentalis*	8,700	100	Declining	AA (2005)	The Dusky Canada Goose subspecies breeds exclusively on the Copper River Delta and Middleton Island. The Good Friday Earthquake of 1964 raised the Copper River Delta two meters, prompting primary plant succession, and increasing predator numbers (e.g., brown bears, Bald Eagles). Dusky populations on the delta have declined over the last 24 years (3.8 percent annual change). The 2009 population estimate was the lowest recorded since surveys began.

[1] Some populations underwent dramatic declines from the late 1970s to the early 1990s (for example, all four eider species). Even though population trends in recent years are stable or increasing, the population remains depressed below historical levels.

	Brant (Pacific) *Branta bernicla nigricans*	147,000	100	Stable	AA (2005)	This subspecies designation includes populations of Black Brant and Western High Arctic Brant. Teshekpuk Lake, on the North Slope of Alaska, supports up to 37,000 Brant during the critical molting season. Virtually the entire population of Pacific Brant stages in Izembek Lagoon. With warming trends, and increased availability of eelgrass during winter, as much as 30 percent of the population now winter along the Alaska Peninsula.
	Emperor Goose *Chen canagica*	78,000	100	Depressed	AA (2005) NAS (2007) IUCN (2010)	Most of the world population breeds on the Yukon-Kuskokwim Delta, and spends spring and fall staging periods on the Alaska Peninsula. These birds declined from an estimated 139,000 in 1964 to 42,000 in 1986, for reasons that are not well understood. The population is stable or increasing slightly.
	Green-winged Teal (Aleutian) *Anas crecca nimia*	10,000	100	Stable	AA (2005)	The Aleutian Green-winged Teal is listed as vulnerable because of relatively small estimated population and range. The Aleutian subspecies breeds and winters on the Aleutian Islands.
	Common Eider (Pacific) *Somateria mollissima v-nigra*	170,000	32	Depressed	AA (2005)	The Pacific Common Eider breeds primarily along the North Slope, Western Alaska, and Aleutian Islands. Populations declined substantially from the 1950s to late 1980s on northern Alaska, Western Alaska, and Canadian breeding grounds. Populations since are stable to slightly increasing.
	King Eider (western population) *Somateria spectabilis*	470,000	100	Depressed	AA (2005)	King Eider populations winter in two geographically distinct areas along either coast. Surveys of the western population suggest significant declines between 1976 and 1996, with possible increase since then. During migration, the entire Pacific population passes by Point Barrow in very large flocks
	Spectacled Eider *Somateria fischeri*	363,000	100	Depressed	AA (2005) NAS (2007)	Populations of Spectacled Eiders were federally listed as threatened following significant declines (more than 90 percent) in populations in western Alaska, but have been slowly recovering over the past decade. Only 10 percent of the global population breeds in Alaska, but virtually all winter in Alaskan waters. Tens of thousands of Spectacled Eiders congregate in ice-free waters south of St. Lawrence Island in winter.

	Steller's Eider (western population) *Polysticta stelleri*	220,000	68	Depressed	AA (2005) NAS (2007) IUCN (2010)	Once numerous on the Yukon-Kuskokwim Delta, this species had virtually disappeared as a breeding species there. The population trend on the Arctic Coastal Plain is variable, with highest densities in the Barrow area (several hundred birds). The majority of the world population winters in Alaska, from the eastern Aleutians to lower Cook Inlet. It is federally listed as a threatened species.
	Black Scoter (western population) *Melanitta nigra americana*	200,000	75	Declining	AA (2005)	Surveys of the western population indicate a significant decline over the last 7–15 years. A popular subsistence species because of its high fat content, about 7,000 ducks are harvested annually on the Yukon Delta in Western Alaska.
	RAPTORS					
	Northern Goshawk (Queen Charlotte) *Accipiter gentilis laingi*	1,400	61	Unknown	AA (2005)	This subspecies occurs in low densities throughout the coastal temperate rainforest of Southeast Alaska and British Columbia. Range-wide population estimates are 300–700 pairs, with an unknown number of non-breeders. Clear-cut logging has probably reduced populations from historical levels, especially in the southern half of its range.
	GROUSE and PTARMIGAN					
	Spruce Grouse (Prince of Wales) *Falcipennis canadensis isleibi*	< 25,000	100	Unknown	AA (2005)	This subspecies occurs in the Prince of Wales Island complex in southern Southeast Alaska. Population size is unknown, but is probably under 25,000 individuals. Threats include mammalian predators (pine marten, wolves, human hunters), avian predators (Northern Goshawk), and vehicles on roads.
	Rock Ptarmigan (Evermann's) *Lagopus muta evermanni*	< 25,000	80–100	Unknown	AA (2005)	This subspecies was extirpated on a number of Aleutian Islands by introduced foxes in the late 1800s and early 1900s. Foxes have now been successfully removed from a number of these islands. Recent reintroduction efforts show promise for eventually restoring this subspecies to its original distribution and status.

	SHOREBIRDS					
	American Golden-Plover *Pluvialis dominica*	200,000	45	Declining	AA (2005) NAS (2007) ASG (2008)	The American Golden-Plover is apparently declining, possibly due to habitat loss on wintering grounds in South America and changing agricultural practices on migratory staging grounds in the American Midwest.
	Black Oystercatcher *Haematopus bachmani*	10,800	65	Stable	AA (2005) ASG (2008)	This large-bodied shorebird has a small population that depends on a narrow strip of rocky, coastal habitat throughout the year. Oystercatchers are highly sensitive to disturbance and mammalian predators.
	Short-billed Dowitcher *Limnodromus griseus caurinus*	75,000	100	Unknown	USFWS (2008) ASG (2008)	This subspecies breeds entirely within Alaska, and has a small population size. Population trends are unknown, but other subspecies are declining. Threats include harvest for subsistence and loss of habitat on winter range.
	Hudsonian Godwit *Limosa haemastica*	70,000	11	Unknown	AA (2005) NAS (2007) USFWS (2008) ASG (2008)	This species is a long-distance migrant, moving from a few breeding sites in the Arctic to a small wintering range in southern South America. In preparation for this long flight, it gorges on aquatic plants—an unusual diet for a shorebird. The Alaska population is small, genetically distinct, and relatively vulnerable.
	Bar-tailed Godwit *Limosa lapponica baueri*	100,000	100	Declining	AA (2005) NAS (2007) USFWS (2008) ASG (2008)	This subspecies breeds only in Alaska, and winters on the southeastern coast of Australia and in New Zealand. On the southward migration, it undertakes the longest nonstop flight of any shorebird species, covering over 7,000 miles and losing half its body weight in the process. Threats include habitat degradation and hunting at stopover sites (in northward migration) along the Yellow Sea in eastern Asia.
	Marbled Godwit *Limosa fedoa beringiea*	2,000	100	Unknown	AA (2005) NAS (2007) ASG (2008)	This subspecies has a very small population size, and breeds only along a small section of the central Alaska Peninsula. Fewer than a dozen nests have been found.
	Whimbrel *Numenius phaeopus rufiventris*	26,000	85	Unknown	AA (2005) USFWS (2008) ASG (2008)	Populations of this Alaska and western Canada subspecies are small, and trends are poorly known. Drastic reductions of the intertidal mangrove habitat this species depends on in its Latin America wintering grounds is a concern.

	Bristle-thighed Curlew *Numenius tahitiensis*	10,000	100	Unknown	AA (2005) NAS (2007) USFWS (2008) ASG (2008) IUCN (2010)	The Bristle-thighed Curlew has highly restricted breeding and wintering ranges. An estimated 3,200 pairs nest in two localities: the Andreafsky Wilderness near the Yukon Delta, and on the central Seward Peninsula. The birds overwinter on widely scattered mid-oceanic islands. They are the only shorebirds to have a completely flightless period during their molt, making them vulnerable to mammalian predators on their wintering grounds. Populations appear stable.
	Lesser Yellowlegs *Tringa flavipes*	400,000	45	Declining	USFWS (2008) ASG (2008)	This species is declining rapidly based on Breeding Bird Survey data. Causes may include drying of boreal wetland habitat on their breeding grounds as a result of recent climate changes and habitat degradation on wintering grounds in Latin America.
	Solitary Sandpiper *Tringa solitaria cinnamomea*	50,000	80	Declining	AA (2005) USFWS (2008) ASG (2008)	A dispersed nester in boreal woodland forests, this subspecies has a relatively small population. Populations are declining for unknown reasons.
	Wandering Tattler *Tringa incana*	25,000	60	Declining	AA (2005) NAS (2007)	The Wandering Tattler is a montane-nesting shorebird that migrates and winters along rocky shorelines. Populations are small, and are declining based on Breeding Bird Survey data. Reasons for the decline are unknown.
	Black Turnstone *Arenaria melanocephala*	95,000	100	Stable	AA (2005) NAS (2007) ASG (2008)	The entire global population of Black Turnstones breeds in Alaska. During migration, the species historically staged on beaches in Prince William Sound where herring once spawned in abundance.
	Surfbird *Aphriza virgata*	70,000	79	Declining	AA (2005) NAS (2007) ASG (2008)	More than 75 percent of the small global population of Surfbirds nests in Alaska. These birds historically concentrated at one site on Montague Island during migration to feed on herring spawn—a resource that is no longer abundant there.
	Red Knot *Calidris canutus roselaari*	39,000	100	Declining	AA (2005) NAS (2007) USFWS (2008) ASG (2008)	Only a few thousand birds of this subspecies nest in Alaska, but all of the North American population migrates through Alaska. This subspecies, like others, is declining. Conservation concerns include unsustainable hunting on the wintering grounds and low reproductive success on the breeding range.
	Rock Sandpiper *Calidris ptilocnemis ptilocnemis*	25,000	100	Declining	AA (2005) NAS (2007) USFWS (2008) ASG (2008)	This subspecies breeds on Bering Sea islands, where their habitat has been markedly altered by reindeer grazing. A major portion of the small population winters in Cook Inlet, the furthest north of any Pacific shorebird.

	Dunlin *Calidris alpina arcticola, C. a. pacifica*	500,000	100	Declining	AA (2005) USFWS (2008) ASG (2008)	The *pacifica* subspecies nests in western and northern Alaska. A small percentage of the *articola* subspecies nests in western Canada. Both subspecies are relatively abundant, but appear to have undergone significant declines. The *articola* subspecies has suffered an alarming rate of habitat loss on its wintering grounds in eastern Asia.
	Buff-breasted Sandpiper *Tryngites subruficollis*	56,000	27	Declining	AA (2005) NAS (2007) USFWS (2008) ASG (2008) IUCN (2010)	The Buff-breasted Sandpiper is unique among North American shorebirds in having a lek mating system. It dropped from a population of millions in the 1800s to near extinction by 1920 as a result of unregulated market hunting and habitat loss. In Alaska, breeding occurs on the northeastern Arctic coastal plain. The bird migrates through the central US to wintering grounds in Argentina, Uruguay, and Brazil. The widespread conversion of grasslands to agriculture on its winter range is contributing to the ongoing decline.
	SEABIRDS					
	Black-footed Albatross *Phoebastria nigripes*	109,000	18	Depressed	USFWS (2006) NAS (2007) USFWS (2008) IUCN (2010)	Black-footed Albatross nest primarily on the Hawaiian Islands, but forage during summer in Alaska waters, making up to 5,000-mile round-trips to obtain food for their young. Plume hunters decimated the species during the late 1800s. Bycatch in long-line fisheries is a more modern concern. Since 1997, mandatory seabird deterrent devices have dramatically reduced bycatch, but populations remain depressed far below historical numbers.
	Short-tailed Albatross *Phoebastria albatrus*	2,400	32	Depressed	AA (2005) USFWS (2006) NAS (2007) IUCN (2010)	The Short-tailed Albatross was formerly the most abundant albatross in the North Pacific, once numbering in the millions. Decimated by plume and egg hunters in the early 1900s, the species was believed extinct in the 1950s. Fortunately, a few juvenile birds at sea survived; eventually returning to Toroshima Island, near Japan, to breed. Today, the population is just 2,350 birds. Outside the breeding season, this species spends most of its time foraging in Alaska waters where it is exposed to bycatch in long-line fisheries. The greatest threat, however, is of a volcanic eruption that could destroy the main colony. This species is federally listed as an endangered species.
	Ivory Gull *Pagophila eburnea*	28,000	4	Declining	NAS (2007) IUCN (2010)	The Ivory Gull is an inhabitant of Arctic ice floes and snowfields. It has a patchy, circumpolar breeding distribution, with small numbers wintering in the Bering and Chukchi seas. The birds feed on Arctic cod and krill in open water near ice, and may also scavenge after polar bear kills. Ivory Gulls, which are rare and declining, are on Canada's Endangered Species list.

	Red-legged Kittiwake *Rissa brevirostris*	213,500	98	Variable	AA (2005) NAS (2007) USFWS (2008) IUCN (2010)	This small gull breeds in only five or six locations in the world, all in the Bering Sea. A single colony, on Saint George Island, contains 80 percent of the world's population. Population trends vary among different colonies. Because the population breeds in just a few places, it is deemed vulnerable.
	Aleutian Tern *Onychoprion aleuticus*	18,500	51	Declining	AA (2005) NAS (2007) USFWS (2008)	The Aleutian Tern is rare worldwide, with about half of the population occurring in Alaska. The species is poorly monitored, but populations in both Siberia and Alaska are thought to be declining. Aleutian Terns are not as aggressive as Arctic Terns, and are sensitive to disturbance and predation on nesting colonies.
	Marbled Murrelet *Brachyramphus marmoratus*	360,000	75	Declining	AA (2005) USFWS (2006) NAS (2007) USFWS (2008) IUCN (2010)	The Marbled Murrelet is a noncolonial seabird that nests in the upper canopy of old-growth trees. The bird is federally listed as threatened in the lower 48 states, where loss of old growth nesting habitat from logging is a suspected cause for declines. Threats in Alaska include marine regime shifts that affect food supply, predation by avian predators, incidental bycatch in gillnet fisheries, and logging of old-growth habitat.
	Kittlitz's Murrelet *Brachyramphus brevirostris*	24,000	76	Declining	AA (2005) USFWS (2006) NAS (2007) USFWS (2008) IUCN (2010)	The Kittlitz's Murrelet, like the Marbled Murrelet, is a non-colonial nester. It is a much rarer bird, however, and nests on non-vegetated rock on mountain tops. The bird breeds in scattered locations along the northern Gulf of Alaska and Bering Sea coast, and is found as far north as the Chukchi Sea. Densest numbers are found in fjords with glacial influence, including Glacier Bay, Icy Bay, and Prince William Sound. Populations are declining, with principle threats being oil spills; habitat change; and mortality from avian predators, including eagles and falcons.
	Whiskered Auklet *Aethia pygmaea*	121,000	96	Stable	AA (2005) NAS (2007) USFWS (2008)	These small seabirds are endemic to a group of volcanic islands in the western Aleutians and the Commander and Kuril islands of Russia. The "whiskers" are specialized feathers that help the bird navigate its nesting burrow in the dark. Introduced foxes decimated the auklets, but the birds are slowly recovering following fox removal. The birds remain highly vulnerable to depredation by rats.

	PERCHING BIRDS					
	Olive-sided Flycatcher *Contopus cooperi*	1,200,000	25	Declining	AA (2005) NAS (2007) USFWS (2008) IUCN (2010)	The Olive-sided Flycatcher has a low reproductive rate for a passerine. It breeds in montane and northern coniferous forests, at forest edges and openings. Populations are declining 3–3.5 percent per year in North America. A suspected cause is loss of forested habitat in its South American wintering grounds. This species favors post–forest fire habitat with standing dead trees, so fire suppression efforts may be detrimental.
	Varied Thrush *Ixoreus naevius*	30,000,000	50	Declining	NAS (2007)	The Varied Thrush breeds in wet coniferous or mixed forests. It prefers mature forests with a closed canopy. It is abundant, but declining by 3–4 percent per year. Threats include loss of mature forest due to logging, especially in the southern portion of its range.
	Blackpoll Warbler *Dendroica striata*	20,000,000	30	Declining	AA (2005)	This warbler breeds in boreal coniferous forest (primarily spruce), tall shrubs, and alder thickets. It winters in Puerto Rico and northern South America, flying a route that takes it more than 1,800 miles across open water, lasts longer than 80 hours, and consumes half the bird's body mass. Although abundant and widespread, Blackpoll Warblers are declining at 2.6 percent per year. Cause of the decline is unknown.
	McKay's Bunting *Plectrophenax hyperboreus*	31,000	100	Unknown	AA (2005) NAS (2007) USFWS (2008) IUCN (2010)	One of North America's rarest songbirds, McKay's Bunting breeds only on two small islands in the Bering Sea. It winters along the western Alaska coast. Given its small population, tiny range, and ground-nesting habits, it is deemed vulnerable.
	Song Sparrow (Aleutian) *Melospiza melodia maxima*	< 25,000	100	Unknown	AA (2005)	This subspecies, found in the central and western Aleutian Islands, is the largest form of song sparrow. Little is known about the status of these birds, other than population range and size are relatively small, and they are island endemics. They are vulnerable to introduced mammalian predators.
	Smith's Longspur *Calcarius pictus*	75,000	33	Unknown	AA (2005) NAS (2007) USFWS (2008)	Smith's Longspur population numbers and trend are poorly known. The Smith's Longspur is polygynandrous (each sex mates with multiple partners). Over a period of just one week, a female will copulate over 350 times on average, making it the highest known copulation rate of any bird.

	Rusty Blackbird *Euphagus carolinus*	2,000,000	29	Declining	AA (2005) NAS (2007) USFWS (2008) IUCN (2010)	The Rusty Blackbird has undergone a dramatic long-term decline, from an estimated 13 million birds in 1965 to only 2 million birds today. Acid rain and mercury accumulation on the breeding grounds may be harming the species. Changes in boreal forest wetlands associated with climate change may impact the Rusty Blackbird. Loss of wintering habitat has also played a role in this bird's decreasing numbers.

Table 5. Changes in species or subspecies on the Alaska WatchList from 2005 to 2010.

Species Added	Species Removed	Comments
Black-footed Albatross (*Phoebastria nigripes*)		Forages extensively in Alaska waters. Small population, small breeding area, and vulnerable to by-catch. Listed as endangered by the International Union for the Conservation of Nature (IUCN 2010).
Ivory Gull (*Pagophila eburnea*)		This species is declining throughout its circumpolar range. It is an ice-associated species, possibly affected by climate change. Listed as near-threatened by IUCN.
Short-billed Dowitcher (*Limnodromus griseus caurinus*)		This subspecies has a small population and a restricted breeding distribution. Population trends are unknown but suspected to be declining. The Alaska Shorebird Plan (2008) identifies it as a species of "high concern."
Lesser Yellowlegs (*Tringa flavipes*)		This species has declined significantly over the last 40 years, and is suffering losses from hunting and habitat degradation on its nonbreeding grounds. The Alaska Shorebird Plan (2008) identifies it as a species of "high concern."
Varied Thrush (*Ixoreus naevius*)		Although still abundant, data suggest this species is declining at a rate of 3.5% per year. Loss of forest habitat in the Pacific Northwest may be a contributing factor. This species is on the National Audubon 2007 WatchList.
	Trumpeter Swan (*Cygnus buccinator*)	Alaska supports two thirds of the breeding Trumpeter Swan population. From 1968 to 2005, the population increased at an annual rate of 5.9% per year, and is now near carrying capacity.
	Long-tailed Duck (*Clangula hyemalis*)	This is the most abundant Arctic sea duck (6.5 million birds) with a large circumpolar range. Less than 5% of these birds breed in Alaska. Populations declined dramatically since 1957, but have stabilized somewhat since the 1990s.
	Golden Eagle (*Aquila chrysaetos*)	Golden Eagles are widespread throughout Eurasia and North America, albeit at low densities. Trends are poorly studied, but populations appear stable in Alaska and Canada.
	Gyrfalcon (*Falco rusticolus*)	Gyrfalcons are globally widespread, albeit at low densities. About 5% of the world population breeds in Alaska. North American populations are increasing.
	Peregrine Falcon (*Falco peregrinus anatum; F. p. pealei; F. p. tundrius*)	Three subspecies of Peregrine Falcon occur in Alaska. Populations are small, but stable to increasing.
	Pacific Golden-Plover (*Pluvialis fulva*)	Moderately-sized global population, 19% of which occurs in western Alaska. Population trends are stable or unknown. Not a species of high concern in the Alaska Shorebird Plan (2008).
	Short-eared Owl (*Asio flammeus*)	Despite significant declines, the Short-eared Owl is relatively abundant globally (2,000,000) with one of the widest distributions of any landbird. An estimated 8% of the global population nests in Alaska.