

# THE ALASKA SPECIES RANKING SYSTEM: SETTING PRIORITIES FOR WILDLIFE CONSERVATION



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# **THE ALASKA SPECIES RANKING SYSTEM: SETTING PRIORITIES FOR WILDLIFE CONSERVATION**

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## **Acronyms**

|        |   |
|--------|---|
| ADF&G  | Alaska Department of Fish and Game                    |
| AKNHP  | Alaska Natural Heritage Program                       |
| ASRS   | Alaska Species Ranking System                         |
| BBS    | Breeding Bird Survey                                  |
| CWCS   | Alaska's Comprehensive Wildlife Conservation Strategy |
| FGFWFC | Florida Game and Fresh Water Fish Commission          |
| LE     | Federally-listed Endangered                           |
| LT     | Federally-listed Threatened                           |
| SGCN   | Species of Greatest Conservation Need                 |
| SSC    | State-listed Species of Special Concern               |
| SWG    | State Wildlife Grants                                 |
| USFWS  | U.S. Fish and Wildlife Service                        |

## EXECUTIVE SUMMARY

To identify and prioritize projects that address the conservation needs of wildlife species in Alaska, the Alaska Department of Fish and Game's (ADF&G) Nongame Program recognized the importance of a systematic approach for evaluating and quantitatively analyzing species information. The goal of this project was to develop a logical, consistent and transparent ranking system for wildlife species with conservation needs identified in Alaska's Comprehensive Wildlife Conservation Strategy (CWCS) (ADF&G 2006). The ranking system will help provide more specific programmatic guidance by prioritizing conservation efforts across taxa and suggesting knowledge gaps that could be addressed by a variety of partners.

The Alaska Natural Heritage Program (AKNHP), working in concert with the ADF&G Nongame Program, reviewed different approaches, and ultimately selected a prioritization ranking system developed for the Florida Game and Fresh Water Fish Commission (FGFWFC), and first described by Millsap et al. (1990), as a model for Alaska's species ranking effort. Within the Millsap et al. (1990) ranking system, vertebrate species are ranked based on biological vulnerability and extent of knowledge of population status and management needs. Advantages of this approach include scores that are explicit and traceable, the ability to update ranks as better information becomes available, and flexibility in setting priorities as a result of separate subscores and sorting mechanisms.

**The Alaska Species Ranking System (ASRS)** closely follows the ranking scheme developed by Millsap et al. (1990), although modifications were made to improve its applicability to Alaska. The ranking system is divided into three component parts: 1) **Biological Scores** are the sum of eight variables that reflect different aspects of a taxon's distribution, abundance and life history; high biological scores indicate greater vulnerability to extirpation; 2) **Action Scores** are the sum of individual scores for four variables that reflect the current state of knowledge or extent of conservation efforts directed toward a given taxon within Alaska; high action scores denote poorly known, unmanaged taxa; and 3) four **Supplemental Variables** are used to sort taxa to answer specific questions in relation to taxonomic significance, season of occurrence, level of harvest and whether or not a taxon is peripheral. The ASRS provides a biological score and an action score for each taxon evaluated. The use of multiple variables allows for flexibility in the ranking system so that it can be queried in a myriad of ways to provide answers to specific conservation questions.

We ranked a total of 341 species, subspecies, or populations including 6 amphibians, 213 birds, and 122 mammals. A major two year effort was required to complete the ranking process. System development included a pilot project to rank and evaluate a subset of the nominee taxa, an internal review by ADF&G Nongame staff after all taxa were ranked, an expert review for taxa with missing information, and a consistency check across all variables.

We examined the results to assess the ability of the ranking system to adequately evaluate biological vulnerability and the current state of scientific knowledge. We conducted analyses to explore the interrelationships among variables, compared scores to other existing agency listing designations, and assessed whether there were taxonomic biases within the system. To better

assist with interpretation of biological and action scores, we also devised categories to group taxa according to biological vulnerability and action need.

Statistical analyses revealed no strong correlations among the biological variables or the action variables. Principal components analysis revealed that both population status and life history variables were important in explaining the variance in biological scores. When comparing biological scores to Federal and State status designations, no differences were observed between unlisted and listed species. This was attributed to the high proportion of Federally-listed species that occur primarily outside of Alaska and the obsolete nature of the State species of special concern list. A more meaningful comparison was made with NatureServe conservation status ranks, a nationally recognized ranking protocol that ranks the global and state status of all taxa from critically imperiled to secure. This comparison revealed an increase in median biological scores from secure to critically imperiled indicating that the ASRS follows a similar pattern observed in a well known and accepted ranking system and accurately represents the relative status of taxa across a wide range of status conditions.

Comparison of scores among vertebrate classes revealed higher biological and action scores for mammals compared to birds. The higher biological and action scores received by mammals were primarily due to a high proportion of endemic mammal taxa included in the ranking. We also compared individual action scores among classes with and without endemic taxa. The only observable differences for both these analyses were higher management scores for mammals compared to birds. Due to the observed lack of between class differences and the associated large amount of within class variation, we found that evaluation of action scores at the class level was too coarse to reveal any significant relationships. A comparison of action scores below the class level (i.e. within or between Order or Family) may be more meaningful, but was not conducted for this project.

We did not use the results from the variable analysis to adjust the ranking system. Instead, they are presented here to alert users of the potential biases and limitations of the system. In order to fairly evaluate the system, we feel that all vertebrate taxa in Alaska need to be included in the ranking. The current system provides biological and action scores based on the best available knowledge. To fully interpret and use the scores to guide decisions regarding wildlife conservation in Alaska, users of the system should read the criteria justification provided in the database and acknowledge the extent of the expert review prior to drawing conclusions. Furthermore, we encourage users of the ASRS to utilize the supplemental variables to sort taxa based on taxonomic significance, seasonal occurrence, level of harvest, and peripheral status.

We acknowledge that the ASRS is a complex ranking system that requires the user to have a fair amount of prior knowledge about the ranking criteria and the scoring system to be able to interpret results correctly and use them prescriptively for wildlife conservation. Furthermore, this report was developed to address all facets of the ASRS, from development to analyses through implementation, and is therefore quite lengthy. Owing to the length and breadth of the report, we have included a “Frequently Asked Questions” section (see Appendix I) as a quick reference for users.

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## INTRODUCTION

Resources (e.g. time and money) available for biodiversity conservation are invariably in short supply relative to the needs for those resources (Master 1991, Regan et al. 2004). Not surprisingly, methods for prioritizing potential target species in terms of their conservation status are integral components of the conservation planning process (Knapp et al. 2003). Many states in the U.S. have developed their own systems in order to prioritize conservation actions and/or to appoint “official” state designations such as “endangered,” “threatened” and “species of special concern”.

To make the best use of federal funds provided through the Wildlife Conservation and Restoration and the State Wildlife Grant (SWG) programs, Congress directed each state to develop a Comprehensive Wildlife Conservation Strategy (CWCS). As a primary objective, Congress further directed each state to identify and focus on species of greatest conservation need (SGCN). With the completion and approval of Alaska’s CWCS in 2005, the Alaska Department of Fish and Game (ADF&G) became eligible for congressional SWG appropriations. To identify and prioritize projects that address the species of greatest conservation need in Alaska, ADF&G recognized the importance of a systematic approach for evaluating and quantitatively analyzing species information.

About 600 species or subspecies of vertebrate animals regularly occupy Alaska’s terrestrial habitats. With such a large array of taxa it is difficult to objectively allocate limited resources to those most in need of active conservation. Initially, the Alaska CWCS compiled a list of nominee species that contained 400 species of greatest conservation need (ADFG 2006). This list was derived from conservation plans, lists from conservation organizations, and expert and public comments. Although a number of evaluation criteria were considered to develop the nominee list, no criteria were used to objectively score species. This approach, along with the sizeable number of species, has limitations for guiding future project and funding decisions. To help remedy this, the CWCS identified the need for an objective ranking process and suggested that a key requirement was to complete a systematic statewide species ranking process as part of the state’s initial implementation effort.

To meet this need, the Alaska Natural Heritage Program (AKNHP), working in concert with the ADF&G Nongame Program, reviewed a variety of options for systematically ranking and evaluating the conservation status of species, including a number of basic approaches that were described in other states’ conservation strategies. After extensive consultation and discussion with other programs, the approach used by the Florida Game and Fresh Water Fish Commission (FGFWFC), and first described by Millsap et al. (1990), was selected as a model for Alaska’s species ranking effort. Within the Millsap et al. (1990) ranking system, vertebrate taxa are ranked based on biological vulnerability and extent of knowledge of population status and management. Advantages of the Millsap et al. (1990) approach include scores that are explicit and traceable, the ability to update ranks as better information becomes available, and flexibility in setting priorities as a result of separate subscores and sorting mechanisms.

Since the publication of Millsap et al. (1990) Wildlife Monograph, this procedure has been adjusted and employed as a tool to guide conservation decision making in a number of states,

other countries, and also within the National Park system. At the state level, a modified Millsap approach was used to set priorities for species ranking in Indiana (Knapp et al. 2003) and for identifying species of concern in Maine (Ritchie et al. 2005). Baldi et al. (2001) adapted the Millsap system to set priorities for the conservation of terrestrial vertebrates in Hungary and Lunney et al. (1996) customized the Millsap et al. (1990) ranking system to identify and prioritize endangered fauna in New South Wales, Australia. At a finer scale, Garret and Wright (2000) used a modified Millsap approach to prioritize research and monitoring needs for terrestrial mammals within the U.S. National Parks system.

Over a two-year period from 2006 to 2008, ADF&G's Nongame Program entered into a partnership with AKNHP to research and develop a consistent and transparent priority ranking system for wildlife taxa in Alaska. The project objective was to provide a logical ranking of all vertebrate taxa with respect to biological vulnerability and current state of knowledge in order to prioritize conservation efforts across taxa and suggest knowledge gaps. Results of the ranking exercise would be used to provide up-to-date species level information for strategic decision making, better-inform cooperators, allow for better inter-divisional coordination, and increase public support for wildlife conservation expenditures.

Here, we describe the **Alaska Species Ranking System** (ASRS) and present ranks of taxa according to specific sets of criteria. We summarize the methods that were employed to develop the priority ranking system, including modifications made to the Millsap et al. (1990) ranking and scoring system to improve its efficacy in Alaska. We also illustrate ways that ranks can be used to prioritize wildlife conservation decisions across taxa in Alaska.

## METHODS

### Development of the Ranking System

System development began in January 2006. ADF&G, AKNHP and U.S. Fish and Wildlife Service (USFWS) staff participated in a teleconference with Thomas Eason and Jeff Gore from the Florida Fish and Wildlife Conservation Commission (FF&WCC). Jeff Gore was a co-author on the Millsap et al. (1990) Wildlife Monograph and the FF&WCC has been using the Millsap ranking system to guide wildlife conservation decisions in Florida for almost two decades. The Florida team advised us of the strengths and weaknesses of their system and made suggestions for modifications that would improve the applicability of a similar ranking system for Alaska. They also provided us with a copy of their project database, which they currently use to house and update all project data.

Based on discussions with the FF&WCC team and after a thorough review of the ranking literature, we decided to implement a three-pronged ranking system similar to Millsap et al. (1990), which considers biological, action, and supplemental variables. We specifically selected this three-pronged approach because variables are designed to be applicable to all vertebrate taxa, the system yields independent measures of biological vulnerability and state of knowledge for each taxon, and the system is flexible enough to allow sorting of taxa based on any combination of variables (Millsap et al. 1990). Categories were adopted from Millsap et al. (1990) and adjusted when deemed necessary to describe the range of variation within each

variable. Variable descriptions and modifications made to the Millsap et al. (1990) ranking and scoring system for Alaska are described later in the methods section.

To test the initial system, a pilot evaluation was conducted using a subset of 26 taxa from the CWCS nominee species list (ADF&G 2006). Pilot taxa were selected by ADF&G and AKNHP staff to represent a sample of potentially data deficient, common, and rare taxa across all vertebrate taxonomic groups, including birds, fishes, mammals, and amphibians (Appendix II). Pilot study results were reviewed by ADF&G Nongame and AKNHP staff to assess the consistency and accuracy of the ranking system. Criteria were then refined to assign more accurate weights, to maximize consistency and to reduce taxonomic bias.

In the first year of the project, AKNHP ranked 200 taxa and presented these preliminary results to ADF&G Nongame Program staff for further evaluation. With a much larger sample, reviewers were able to better identify ambiguities in the evaluation criteria and scores. Once again, the criteria were modified based on reviewer comments. Using the now refined ranking system in year two of the project, we: 1) updated any pertinent information for the previously ranked 200 taxa as a result of changes to the ranking criteria and 2) completed ranking for all remaining taxa.

## **Selection of Taxa**

### ***Criteria for Inclusion***

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The list of nominee species included in the Alaska CWCS (ADF&G 2006) was derived from existing conservation plans, lists from conservation organizations, and expert and public comments. The list included 400 taxa represented by five classes: birds, mammals, amphibians, fishes and invertebrates. The CWCS nominee species list was considered representative of the species of greatest conservation need in Alaska, but also subject to change depending on updates in conservation plans and by organizations. Prior to implementing the ASRS, we refined the nominee species list to reflect any recent changes to conservation status, taxonomic status, and occurrence in Alaska. Taxa considered accidental and casual in their occurrence were excluded. Although two fish species were included in the pilot testing to insure that the system worked across all taxa, fishes and invertebrates were excluded from the remainder of the ranking process. Overall, a total of 341 species, subspecies, or populations were ranked for this project, including: 213 birds, 122 mammals, and 6 amphibians.

### ***Inclusion of Subspecies and Populations***

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In addition to ranking taxa at the species level, we also ranked subspecies and populations (e.g. Cook Inlet Beluga whale) that were included in the CWCS nominee list, although this was sometimes problematic. In Alaska, the systematic status of many subspecies is not well understood or researched. Many subspecific designations were made more than 50 years ago and were based on morphological measurements from often times very small sample sizes. The authors of the Millsap et al (1990) monograph were also concerned that by using all described subspecies they risked ranking a taxon highly that might later be found identical to more widespread, secure populations of the same species. We elected to rank all subspecies that were included in the nominee list, cognizant of the fact that many of the subspecies that we treated separately may not be highly differentiated and may no longer warrant subspecific status. To

that end, we encourage end-users of the ASRS to consider the taxonomic status of high-ranking taxa when setting conservation priorities. This is facilitated by using the supplemental variable “Systematic Significance of the Taxon” (described below) as a sorting mechanism. Populations were ranked in a similar manner and can also be identified through the “Systematic Significance of the Taxon” supplemental variable.

The Marine Mammal Protection Act establishes “stocks” or “population stocks” as the appropriate conservation/management unit for marine mammals. Marine mammal species often consist of multiple stocks within separate spatial arrangements that interbreed when mature (Cottingham 2005). Many marine mammal “stocks” in Alaska are inclusive of the entire population of the species that occurs in the state (e.g., there are four recognized “stocks” of Fin whales in North America of which the Northeast “stock” is representative of the entire Fin whale population that occurs in Alaska). Consequently, most marine mammal stocks were categorized at the “species” level and ranked accordingly. Exceptions to this rule included the Steller sea lion (*Eumetopias jubatus*), for which there are two population stocks in Alaska (Eastern and Western) and was therefore ranked as two separate “populations”, and the Northern sea otter (*Enhydra lutris kenyoni*), which was ranked at the species level (inclusive of all three stocks that occur in Alaska) and also at the population level for the declining Southwest stock.

### **Description of the Ranking Variables**

As previously noted, we adopted the basic structure of the Millsap et al. (1990) ranking system, which uses three groups of variables to rank taxa (Figure 1). The first group consists of eight **biological variables** that measure aspects of a taxon’s distribution, abundance and life history. Scores for these eight variables are summed to yield a biological score for each taxon, with higher biological scores suggesting greater vulnerability to extirpation. The second group consists of four **action variables** that measure the current state of knowledge or extent of conservation efforts directed toward a given taxon within Alaska. The sum of scores for the four action variables yields an action score, with higher action scores denoting greater information needs due of lack of knowledge or conservation action. The third group contains four **supplemental variables** that are used to sort taxa in relation to taxonomic significance, season of occurrence, harvest and whether or not the taxon is peripheral in its range. Each taxon is evaluated for each of the 16 total variables. The use of multiple variables allows for flexibility in the ranking system so that it can be queried in myriad ways to provide answers to specific conservation questions.

## The Alaska Species Ranking System

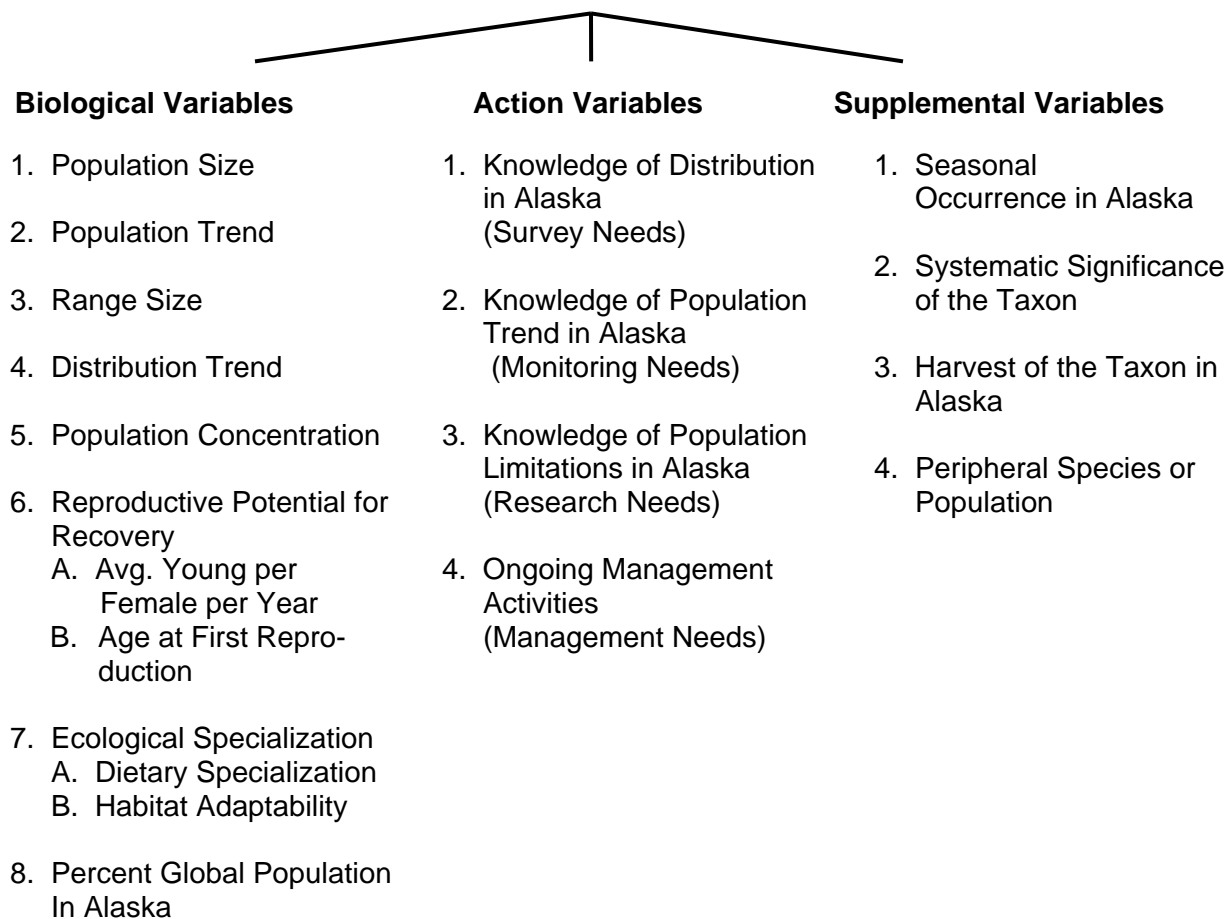


Figure 1. Structural schematic of the Alaska Species Ranking System (ASRS). The eight biological and four action variables are used to score individual taxa. Supplemental variables are used for sorting and do not receive numerical scores (adapted from Millsap et al. 1990).

**Biological Variables** – Scores for biological variables are based on the geographic range of the taxa (species, subspecies, population) within Alaska. Biological scores are calculated from the sum of eight variables whose individual scores range from -10 to 10 (Table 1). The potential range of the total biological score for each taxon is -80 to 80 points.

1. Population Size. – The known or suspected adult population size in Alaska. This variable gives the highest score to taxa with the lowest number of adult individuals, recognizing that taxa with smaller population sizes are more vulnerable to extirpation. If the adult population size is unknown but suspected to be small, the taxon is placed in category (B). If the adult population size is unknown but suspected to be large, the taxon is placed in category (E).
2. Population Trend. – The overall trend in number of individuals throughout the taxon’s range in Alaska over the last two decades. This variable recognizes that taxa with declining population trends are a concern regardless of population size. Categories are separated according to increasing or decreasing and known or suspected trends.

We used BBS data to assess population trends for birds unless high quality statewide data were available from other sources. Alaska BBS data were not used when credibility scores indicated an important deficiency in the data based on very low abundance, very small sample sizes (number of routes), or very imprecise estimates (Sauer et al. 2008). Trends with an insufficient credibility were ranked as “unknown” (score = 0). Insignificant trends with adequate credibility scores (fewer to no deficiencies) were designated as “unknown, but suspected to be stable or increasing” (B). When Alaska BBS data were unavailable or had insufficient credibility scores, we then used BBS data for the continental U.S. and Canada to evaluate trends. When national BBS data were used, trends were always designated as “unknown, but suspected to be stable or increasing (B) or decreasing (D)”.

3. Range Size. – The total areal extent occupied by the taxon in Alaska with no consideration of habitat suitability. This variable gives the highest weight to taxa with the smallest ranges recognizing that they are more vulnerable to disturbance. When a significant portion of a taxon’s population is present in Alaska during more than one season, this variable is based on the season when range size is most restricted.
4. Distribution Trend. – The percent historical change in distribution over the last 50 years. Distribution is the spatial extent occupied by the taxon with consideration of habitat suitability in Alaska. This variable assumes that taxa with fragmenting or contracting ranges are more vulnerable to extirpation than taxa with intact or expanding ranges.
5. Population Concentration. – The degree to which individuals within populations concentrate or aggregate seasonally at specific locations in Alaska (i.e. breeding sites, migration stopover areas, hibernacula). This variable implies a regular temporal compression of the distribution. This variable gives more weight to taxa that concentrate, assuming that they are more susceptible to stochastic events than taxa that do not aggregate.

6. Reproductive Potential for Recovery. – This variable is a surrogate for a taxon’s ability to recover from population declines or respond to management actions. The variable consists of two parts and gives the most weight to taxa that produce fewer offspring at a later age, assuming that they will take longer to recover from or respond to environmental changes.
  - (A) The average number of eggs or live young produced per adult female per year.
  - (B) The minimum age at which a female first reproduces.
  
7. Ecological Adaptability. – This variable consists of two parts and considers the ecological specialization of a taxon. This variable gives the most weight to dietary and/or habitat specialists that depend on scarce resources, assuming that they are less capable of adapting to environmental changes.
  - (A) Dietary specialization recognizes that taxa that have specific dietary niches are more vulnerable to environmental changes than taxa with wide feeding tolerances.
  - (B) Habitat adaptability considers habitat use within the season when taxa are the most specialized.
  
8. Percent of Global Population in Alaska. – This variable reflects Alaska’s stewardship responsibility to the conservation of a taxon. More weight is given to taxa that have a higher percentage of their global population occurring within Alaska. This variable assumes that the higher the percentage, the greater the impact status and management actions within the state will have on the persistence of the taxa at the global scale.



Table 1. Biological variables, categories within variables and scores used to rank taxa.

| <b>Biological variables and categories</b>   | <b>Score</b> | <b>Biological variables and categories</b>   | <b>Score</b> |
|--|--------------|--|--------------|
| <b>Population size: known or suspected adult population size in Alaska</b>   |              | D. Area occupied has declined by 1-9%  | -5           |
| A. 0-500   | 10           | E. Area occupied is stable or has increased  | -10          |
| B. 501-1000, or population is unknown but suspected small  | 6            | <b>Population concentration: degree to which populations aggregate at sites seasonally in Alaska (within season when aggregate the most)</b> |              |
| C. 1001-3000   | 2            | A. Population concentrates or occurs at single site  | 10           |
| D. 3001-10000  | -2           | B. Population concentrates or occurs at 2-25 sites   | 2            |
| E. 10001-25000, or population is unknown, but suspected to be large  | -6           | C. Population concentrates or occurs > 25 sites  | -6           |
| F. >25000  | -10          | D. Population concentrates or occurs at > 250 sites or does not concentrate  | -10          |
| <b>Population trend: overall trend in Alaska over the last 2 decades</b>   |              | <b>Reproductive potential for recovery</b>   |              |
| A. Population size known to be decreasing  | 10           | A. Average number of eggs or live young produced/adult female/yr   |              |
| B. Trend unknown, but population size suspected to be decreasing   | 6            | a. <1 offspring  | 5            |
| C. Population formerly experienced serious declines, but is presently stable or increasing   | 2            | b. 1-2 offspring   | 3            |
| D. Population size stable or suspected to be stable or increasing  | -6           | c. 3-9 offspring   | 1            |
| E. Population size known to be increasing  | -10          | d. 10-100 offspring  | -3           |
| <b>Overall range size: size of the range within Alaska (total areal extent occupied with no consideration of habitat suitability) during the season when range is most restricted</b>    |              | e. >100 offspring  | -5           |
| A. < 100 km <sup>2</sup> (<1 township, St. Paul Island)  | 10           | B. Minimum age at which females typically first reproduce  |              |
| B. 100 km <sup>2</sup> to 1,000 km <sup>2</sup> (1-10 township, St. Paul Island to Etolin Island)  | 8            | a. >8 years  | 5            |
| C. 1,001 km <sup>2</sup> to 10,000 km <sup>2</sup> (~1/1500 to 1/150 size of Alaska, Etolin Island to Kodiak Island)   | 4            | b. 4-8 years   | 1            |
| D. 10,001 km <sup>2</sup> to 100,000 km <sup>2</sup> (~1/150 to 1/15 size of Alaska, Kodiak Island to Arctic National Wildlife Refuge)   | -2           | c. 2-3 years   | -3           |
| E. 100,001 km <sup>2</sup> to 400,000 km <sup>2</sup> (~1/15 to 1/4 size of Alaska, Arctic National Wildlife Refuge to Brooks Range + North Slope)                                       | -8           | d. <2 years  | -5           |
| F. >400,000 km <sup>2</sup> (>1/4 size of Alaska, Brooks Range + North Slope)  | -10          | <b>Ecological adaptability: degree to which population is dependent on environmental factors</b>   |              |
| <b>Distribution trend: % historical change in distribution (spatial extent occupied with consideration of habitat suitability) over the last 50 years in area occupied within Alaska</b> |              | A. Dietary specialization  |              |
| A. Area occupied has declined by >50%  | 10           | a. Not adaptable; dietary specialist with key requirements scarce  | 5            |
| B. Area occupied has declined by 25-49%  | 6            | b. Moderately adaptable; dietary specialist with key requirements fairly common  | 1            |
| C. Area occupied has declined by 10-24%  | 2            | c. Highly adaptable; opportunistic feeder  | -5           |
|  |              | B. Habitat adaptability; refers to the habitat used within the season that is most limiting in Alaska  |              |
|  |              | a. Not adaptable; habitat specialist with key requirements scarce  | 5            |
|  |              | b. Moderately adaptable; habitat specialist with key requirements fairly common  | 1            |
|  |              | c. Highly adaptable; habitat generalist  | -5           |

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**Table 1, continued.**

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| <b>Biological variables and categories</b>    | <b>Score</b> |
|---|--------------|
| <b>Percent of global population in Alaska</b> |              |
| A. Taxa is endemic to AK                      | 10           |
| B. > 90% of global population occurs in AK    | 6            |
| C. 75-90% of global population occurs in AK   | 2            |
| D. 50-74% of global population occurs in AK   | -2           |
| E. 25-49% of global population occurs in AK   | -6           |
| F. <25% of global population occurs in AK     | -10          |

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**Action Variables** – Action variables consider the current state of knowledge or extent of conservation efforts directed towards a given taxon within Alaska. Action scores are calculated based on the sum of four action variables whose individual scores range from -10 to 10 (Table 2). The total action score for each taxon may range from -40 to 40 points.

1. Knowledge of Distribution in Alaska (Survey Needs). – Knowledge of a taxon’s distribution within the state is a prerequisite to effective conservation management. This variable gives the highest score to taxa whose distribution in Alaska is least well known.
2. Knowledge of Population Trend in Alaska (Monitoring Needs). – Knowledge of abundance and population trend is an important component to effective management. Taxa that are not currently monitored receive the highest score for this variable. Local monitoring or monitoring that is inadequate to detect a trend is weighed more heavily than statewide monitoring that provides statistically valid abundance or trend estimates.
3. Knowledge of Alaska Population Limitations (Research Needs). – Effective conservation actions require knowledge of factors that are currently limiting to populations. The highest scores for this variable are given to taxa whose major factors limiting distribution and population size are not well understood.
4. Ongoing Management Activities (Management Needs). – Current regulations and management plans for taxa are also a prerequisite to effective conservation planning. This variable gives the most weight to taxa that are not currently managed. An intermediate score is given to taxa that are managed by way of conservation laws and regulations while taxa that are actively managed receive the lowest scores.

Table 2. Action variables, categories within variables and scores used to rank taxa.

| <b>Action variables and categories</b>  | <b>Score</b> |
|---|--------------|
| <b>Knowledge of distribution in Alaska</b>  |              |
| <b>(Survey needs)</b>   |              |
| A. Distribution is extrapolated from few locations or knowledge limited to general range maps                                     | 10           |
| B. Broad range limits or habitat associations somewhat known, but distribution is not well understood throughout range in Alaska  | 2            |
| C. Distribution is well known throughout range in Alaska with knowledge of habitat associations                                   | -10          |
| <b>Knowledge of population trend in Alaska</b>  |              |
| <b>(Monitoring needs)</b>   |              |
| A. Not currently monitored  | 10           |
| B. Monitored locally or statewide monitoring inadequate to detect trend   | 2            |
| C. Statewide monitoring adequate to detect population trend   | -2           |
| D. Statewide monitoring based on population estimates, or nearly complete censuses  | -10          |
| <b>Knowledge of Alaska population limitations</b>   |              |
| <b>(Research needs)</b>   |              |
| A. Factors potentially affecting population size and distribution are speculative, with little awareness about which are limiting | 10           |
| B. Factors potentially affecting the population are known, with some agreement on which 2 or 3 are likely limiting                | 2            |
| C. Factors limiting populations are known, and there is broad consensus about which are limiting                                  | -10          |
| <b>Ongoing management activities</b>  |              |
| <b>(Management needs)</b>   |              |
| A. None directed primarily at the taxon   | 10           |
| B. Management mostly related to enforcement of conservation laws  | 2            |
| C. Some direct management activities in place to benefit this taxon   | -10          |

**Supplemental Variables** – Four supplemental variables are included as mechanisms for sorting the data based on season of occurrence, taxonomic significance, level of harvest, and whether Alaska is on the periphery of a taxon’s range. Supplemental variables are not used to rank taxa. Rather, they are useful in sorting taxa ranked by biological or action scores (Table 3).

1. Seasonal Occurrence in Alaska. – Effective conservation planning and management requires knowledge of the period of residence of the taxon within the state. For example, Alaska is home to a wide-variety of breeding birds during the summer, but many of these animals winter elsewhere; therefore, opportunities for management actions may be limited temporally for many taxa. This variable enables sorting of target taxa by season of occurrence or permanent residence.
2. Systematic Significance of the Taxon. – One of the goals of the ADF&G Nongame Program is to promote and sustain wildlife biodiversity in Alaska. This variable helps to address this goal by recognizing that the more genetically distinct a taxon is, the higher its value to overall species diversity. In this sorting variable, taxonomic categories are used as a gauge for genetic distinctiveness. Members of monotypic families (e.g. the Pacific walrus, *Odobenus rosmarus*) are considered of greater systematic significance than intergrading subspecies (e.g. Turner’s Rock Ptarmigan, *Lagopus muta atkhensis*).
3. Harvest of the Taxon in Alaska. – This variable identifies the extent of protection from harvest and take currently afforded under state and federal law and can be used to recognize highly vulnerable taxa that are not protected.
4. Peripheral Taxa. – Peripheral taxa are taxa at the edge of their range (Fraser 2000). Due to Alaska’s unique geography, many taxa that occur in the state are at the northernmost limits of their ranges or occur irregularly in the state for very short time periods. While it is important to consider peripheral taxa in conservation decision making, it is also important to recognize that a taxon may be considered rare in Alaska because it is at the periphery of its range, but the same taxon may be widespread and secure elsewhere. Here, we define peripheral as any taxon at the edge of its range with less than 10% of its global range known to occur in Alaska (Bunnell et al. 2004).

Table 3. Supplemental variables and categories within variables used to sort taxa.

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**Supplemental variables**

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**Seasonal occurrence in Alaska**

- A. Permanent year-round resident
- B. Resident only during breeding season
- C. Resident only during nonbreeding season
- D. Transient

**Systematic significance of the taxon (highest level of systematic significance)**

- A. Monotypic family
- B. Monotypic genus
- C. Monotypic species
- D. Disjunct population below the species level
- E. Intergrading subspecies

**Harvest of the taxon in Alaska**

- A. Harvest is substantial with no regulations in place
- B. Harvest is substantial with regulations in place
- C. Harvest is not substantial (minor subsistence take, accidental take, or harvest of nuisance animals)
- D. Harvest is prohibited by regulation or the taxon is not harvested

**Peripheral taxa - taxa at edge of range with <10% of global range in Alaska**

- A. Yes
- B. No

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### **Modifications from Millsap et al. (1990)**

#### ***Ranking Criteria***

Several criteria from the Millsap et al. (1990) ranking system were adjusted to better address conservation needs specific to Alaska. Millsap et al. (1990) responded to the biological variables from a range wide (global) perspective (e.g., Population size: the estimated number of adults throughout the range of the taxon). We believe that conservation efforts in Alaska best address range wide issues by focusing conservation on taxa that face challenges within the state, as opposed to taxa that are challenged elsewhere but are secure in Alaska. As a result, we modified the biological variables to reflect a state wide perspective (e.g., Population size: known or suspected adult population size in Alaska).

Within the biological variables, we condensed the ecological specialization variables from three to two, by combining the Millsap et al. (1990) categories “reproductive specialization” and “other specialization” into a single attribute labeled “habitat specialization”. The Millsap et al. (1990) “other specialization” variable considered ecological or behavioral specializations not covered under dietary or reproductive specialization such as strict requirements for hibernacula, narrow ambient temperatures or specific roosting structures. Due to the high rate of seasonal

occurrence of many taxa in Alaska (i.e. migratory birds), we found that answering the “other specialization” category resulted in an inordinately high number of unknowns. We felt that combining reproductive and other specializations into a single category better captured habitat specialization during the season when a taxon was most specialized and provided a more efficient and consistent approach. The responses were also changed for this attribute in order to distinguish between specialists with scarce resources and specialists with common resources (Master et al. 2003).

The Millsap et al. (1990) ranking system has a total of seven biological variables. We added an eighth biological variable to the ASRS to address Alaska’s role in the recovery and conservation of a taxon – Percent of Global Population in Alaska. This variable considers the percent of the global population that occurs in Alaska and was added to improve the efficacy of conservation efforts by elevating scores for taxa that have a higher dependency on Alaska for their persistence.

### *Scoring System*

Since the publication of Millsap et al. (1990) ranking system, a number of authors have evaluated similar ranking systems and suggested improvements to help reduce uncertainty. Regan et al. (2005) identified two types of uncertainty associated with the attributes used to assign ranks – linguistic and epistemic. Linguistic uncertainty arises from differences in interpretation of attribute definitions by different reviewers. Regan et al. (2005) emphasized the importance of discussion and review to reduce inconsistencies and misinterpretation resulting from this type of uncertainty. To address linguistic uncertainty, attributes were explicitly defined and initial assessments were only performed by two individuals to maximize consistency. When experts were consulted, definitions were explained and the initial assessor was available to answer any questions. After ranking was completed, consistency checks for each variable were performed. One person reviewed each criterion for all taxa to minimize reviewer bias.

The second type of uncertainty, epistemic uncertainty, is associated with knowledge of the state of the system and may result from temporal, spatial, and environmental stochasticity, sampling variance, or data interpretation (Regan et al. 2002, Regan et al. 2005). Weighted averages, probabilistic rule sets, and fuzzy sets are several measures of epistemic uncertainty that have been incorporated into conservation priority systems (Knapp et al. 2003). We used weighted averages to compensate for epistemic uncertainty because they were found to provide the best balance between straightforward calculation and incorporating the full probability distribution (Knapp et al. 2003). A probability was assigned to each response category when the response spanned two to three answers. From this, a weighted average was calculated for each attribute:

$$\sum_{i=1}^m \sum_{j=1}^n X_{ij} P_{ij}$$

Where  $m$  = number of attributes,  $i$  = attribute,  $n$  = number of response categories,  $j$  = response category,  $X$  = point value for category,  $P$  = probability (Knapp et al. 2003). When uncertainty for an attribute spanned greater than 3 response categories the attribute was considered unknown and a value of 0 was applied.

Another disadvantage of some classification ranking schemes is how they handle missing data. The Millsap et al. (1990) system ranked biological and action variables on a scale of 0 to 10,

with higher scores indicating greater vulnerability (biological) or lack of knowledge (action). When reviewers were unable to answer a question using available data or information from the literature, Millsap et al. (1990) substituted expert opinion for missing data. When data were unavailable and expert opinion was lacking, the question was answered as unknown and received the lowest possible score (i.e. unknowns were assigned a value of zero). Consequently, taxa that were less known tended to be classified as less threatened (Regan et al. 2005). In order to better address the problem of missing data and to avoid scoring less known taxa as less threatened, we modified the ASRS scoring system so that scores for an individual variable ranged from 10 (highest) to -10 (lowest). In this positive to negative scoring system, missing data were assigned a value of 0, thereby receiving the middle score as opposed to the lowest score.

## Evaluation Process

AKNHP zoology program staff was responsible for evaluating and scoring all taxa included in the priority ranking based on literature review and information gleaned from the Heritage Program's Biotics and NatureServe databases. All answers and sources of information used to categorize each taxon for each variable were entered into a project specific Access database. In 2007, experts were consulted to evaluate only those variables that the initial reviewer had answered as "unknown". In 2008, the review process was modified and experts were asked to evaluate the entire suite of criteria, including the answers to variables already completed by the initial reviewer. Experts were given explicit instructions and were asked to evaluate only taxa they were familiar with. Adequate justification and supportive data were required to make changes to the ranks.

## Analyses

We examined the results of the ranking process to assess the ability of the system to adequately evaluate biological vulnerability and the state of current knowledge. We conducted analyses to explore the interrelationships among variables, compare scores to other existing agency listing designations, and to assess taxonomic biases on the ranking system. Because the scoring system for most variables was non-linear (successive intervals between the scores were not equal), the median was the most appropriate statistic for describing the central tendency of the results.

To examine the interrelationships among biological and action variables, we calculated Spearman's rank correlations. We used R-type principal components analysis without rotation to further investigate the interrelationships among biological variables and to understand how each variable contributed to the overall ranking.

To assess the accuracy of the ranking system we looked at biological and action scores of taxa of known status. Taxa of known status included 1) taxa designated as threatened or endangered by the USFWS or the State of Alaska, or a species of special concern (SSC) by the State of Alaska, and 2) taxa ranked by AKNHP using NatureServe's numerical ranking process. We used a Kruskal-Wallis rank sum test for among status comparisons (Federally endangered, Federally threatened, and unlisted) due to the nonparametric nature of the data ( $\alpha = 0.05$ ) and a Mann-Whitney rank sum test to compare state-listed SSC to unlisted taxa ( $\alpha = 0.05$ ). While there are a

total of 17 SSC in Alaska, the sample size for this analysis was 18 due to the separate ranking of the western and eastern stock of Steller sea lion.

To determine if the ranking system was taxonomically biased we compared biological and action scores among the three classes of vertebrates that were represented in the ranking system: Amphibia, Aves, and Mammalia. We predicted that biological and action scores for mammals would be higher than scores for birds and amphibians due to the large number of endemic mammals on the nominee list. To test this hypothesis, we examined differences in scores among classes for all taxa and then repeated this analysis with endemic taxa excluded. We also predicted that if there was a taxonomic bias in the ranking system it would likely be attributable to two biological variables, population size and reproductive potential. Millsap et al. (1990) found these two variables were of questionable comparability among classes. To determine how these variables influenced biological scores, we then compared biological scores that excluded population size and reproductive potential. We used a Kruskal-Wallis rank sum test for among class comparisons ( $\alpha = 0.05$ ) and a Mann-Whitney rank sum test with a Bonferroni correction for pairwise comparisons ( $\alpha = 0.017$ ).

## **RESULTS and DISCUSSION**

### **Evaluation Process**

For each taxon evaluated we calculated the total biological and action score (Appendix III and IV, respectively). Biological and action scores are calculated separately and never summed to maintain independent measures of biological vulnerability and current state of knowledge. In total, we ranked 341 taxa including 6 amphibians, 213 birds, and 122 mammals. Of the 341 taxa ranked, 82 were subspecies and 8 were ranked at the population level. Biological scores ranged from 42.0 to -72.0 (scale 80.0 to -80.0) while action scores ranged from 40.0 to -40.0 (scale 40.0 to -40.0).

The expert review process was not consistent for the full duration of the project nor was it complete upon the delivery of this report. Our initial goal was to have experts help answer criteria for which the response was unknown. As the process evolved, we found that it was more straightforward to provide reviewers with all of the questions as well as the full response(s) already recorded by the initial reviewer. Overall, expert reviews were completed for 127 taxa, and reviews for 59 taxa were pending at the time this report was developed. Reviews were requested for an additional 115 taxa with no response from the expert(s) contacted and reviews for 40 taxa were not requested at all due to time constraints and/or the evaluation by the initial assessor was deemed complete.

### **Interrelationships among Variables**

To examine the degree of association among variables, we computed Spearman's rank correlations for both biological and action variables. We found no strong correlations among the biological variables ( $r > 0.50$ ; Table 4) or the action variables ( $r > 0.50$ ; Table 5). However, there were moderately strong associations between population size and range size for the biological scores ( $r = 0.47$ ; Table 4) and survey and monitoring action scores ( $r = 0.42$ ; Table 5).



Table 4. Spearman's rank correlations between biological variables.

|                           | Biological variables |                  |            |                    |                          |                        |                           |                |
|---------------------------|----------------------|------------------|------------|--------------------|--------------------------|------------------------|---------------------------|----------------|
|                           | Population size      | Population trend | Range size | Distribution trend | Population concentration | Reproductive potential | Ecological specialization | Percent global |
| Population size           | 1.00                 | 0.01             | 0.47**     | 0.14**             | 0.03                     | 0.00                   | -0.07                     | 0.13*          |
| Population trend          |                      | 1.00             | -0.05      | 0.18**             | 0.22**                   | 0.15**                 | 0.04                      | 0.04           |
| Range size                |                      |                  | 1.00       | 0.14*              | 0.15**                   | -0.21**                | -0.04                     | 0.39**         |
| Distribution trend        |                      |                  |            | 1.00               | -0.03                    | -0.07                  | 0.08                      | 0.12*          |
| Population concentration  |                      |                  |            |                    | 1.00                     | 0.36**                 | 0.18**                    | 0.02           |
| Reproductive potential    |                      |                  |            |                    |                          | 1.00                   | 0.24**                    | -0.23**        |
| Ecological specialization |                      |                  |            |                    |                          |                        | 1.00                      | -0.01          |
| Percent global            |                      |                  |            |                    |                          |                        |                           | 1.00           |

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

Table 5. Spearman's rank correlations between action variables.

|            | Action variables |            |          |            |
|------------|------------------|------------|----------|------------|
|            | Survey           | Monitoring | Research | Management |
| Survey     | 1.00             | 0.42**     | 0.20**   | 0.21**     |
| Monitoring |                  | 1.00       | 0.21**   | 0.37**     |
| Research   |                  |            | 1.00     | 0.31**     |
| Management |                  |            |          | 1.00       |

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

We used R-type principal components analysis without rotation to further investigate the interrelationships among biological variables and to understand how each variable contributed to the overall ranking. Population size, range size, and percent global population were strongly associated with the first component, which accounted for 24% of the total variance in scores (Table 6). Population concentration and reproductive potential loaded highly on the second component along with a moderate association with ecological specialization, accounting for 19% of the total variance. Population trend and distribution trend were strongly associated with the third component, accounting for 13% of the total variance in scores. The first and third components considered population and distribution attributes reflecting their association with population status. Ranking criteria that loaded highly on the second component were more closely associated with life history attributes. We conclude that both population status and life history variables were important in explaining the variance in biological scores.

Table 6. Unrotated factor loadings of biological variables based on R-type principal components analysis of the correlation matrix. Shaded cells indicate which component the factor was most associated with.

|                           | Component |       |       |
|---------------------------|-----------|-------|-------|
|                           | I         | II    | III   |
| Eigenvalue:               | 1.9       | 1.6   | 1.1   |
| % variance:               | 24.3      | 19.4  | 13.3  |
| Population size           | 0.63      | 0.20  | -0.30 |
| Population trend          | 0.06      | 0.51  | 0.59  |
| Range size                | 0.87      | 0.03  | -0.23 |
| Distribution trend        | 0.34      | 0.25  | 0.67  |
| Population concentration  | 0.09      | 0.75  | -0.28 |
| Reproductive potential    | -0.36     | 0.65  | -0.26 |
| Ecological specialization | -0.14     | 0.47  | -0.05 |
| Percent global            | 0.72      | -0.04 | 0.06  |

Millsap et al. (1990) observed similar divisions between population status and life history components. However, in their analyses, population trend and distribution trend were associated with the first component and accounted for a higher percent of the variance than for the same variables in the ASRS. In our study, population status variables were separated into two components with population and distribution trend associated with the third component. The separation of these two variables into a third component was attributed to the high number of “unknowns” for the categories distribution trend and population trend (distribution trend “unknowns” = 218, population trend “unknowns” = 146). With improved knowledge of population and distribution trends in Alaska, we would expect to see a rise in the percent of the total variance attributed to these two variables. We also suspect that analyses of biological variables may have been affected by a taxonomic imbalance in the nominee species list, which was skewed towards birds and endemic small mammals.

## **Accuracy of Biological and Action Scores**

### *Biological Scores*

To determine if the system adequately ranked imperiled taxa, median and rank sum biological scores were computed for federal and state listed vertebrates. Millsap et al. (1990) found marked differences in biological scores between listed and unlisted taxa. Their data demonstrated an increasing trend in median biological scores from species of special concern through endangered taxa. A similar comparison of the ASRS scores to state and federally listed taxa did not yield comparable results. Instead, a histogram comparison revealed no difference in median biological scores and a Kruskal-Wallis rank sum test showed no difference in rank sums between Federally endangered ( $m_d = -21.0$ ;  $n = 11$ ;  $\chi^2 = 5.9$ ,  $p = 0.11$ ), Federally threatened ( $m_d = -7.0$ ;  $n = 5$ ), and unlisted taxa ( $m_d = -29.0$ ;  $n = 314$ ). There was also no difference between SSC ( $m_d = -33.6$ ;  $n = 18$ ;  $U = 2646.5$ ,  $p = 0.52$ ) and unlisted taxa. The interquartile ranges showed a high amount of variation for both federally and state listed taxa (Figure 2).

The lack of a difference in biological scores between federally listed and unlisted taxa was attributed to the large portion of federally listed taxa that principally occur outside of Alaska (e.g. 8 of the 16 federally listed taxa in the state have less than 25% of their global population in the state). Compared to Florida, Alaska likely has a higher probability of having federally listed taxa that are not necessarily imperiled in the state, but face challenges elsewhere in their range. The lack of a difference in biological scores between unlisted and SSC was attributed to the fact that the state list has not been updated since 1998. Development of this ranking system was partially motivated by the need for an objective state listing process in Alaska. The large number of unlisted biologically vulnerable endemics on the ranking list and small sample sizes also likely contributed to the lack of a difference between listed and unlisted taxa.

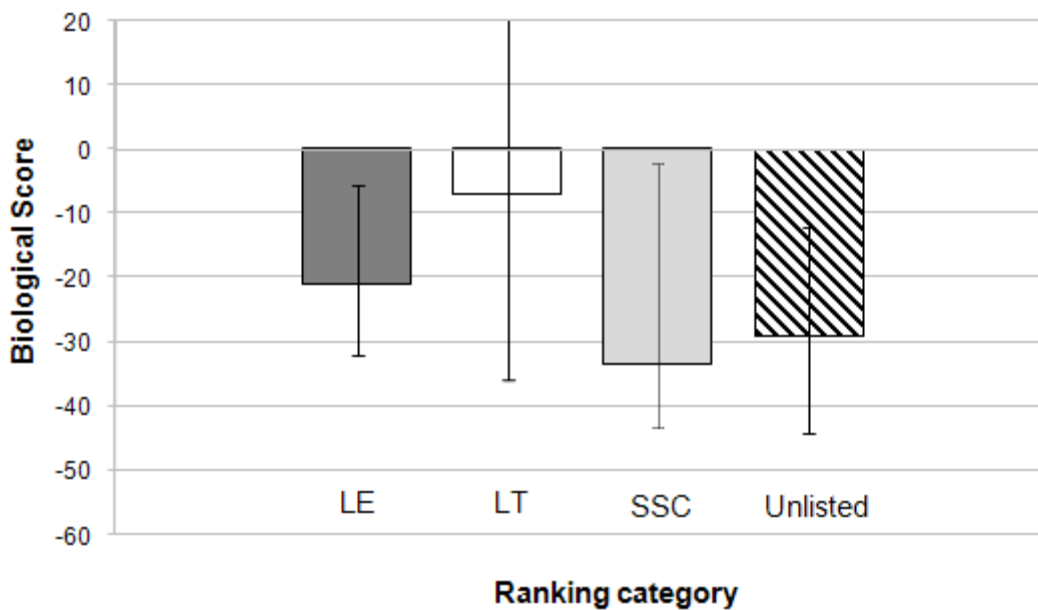


Figure 2. Histogram of median biological scores for federal and state listed taxa. Error bars are interquartile ranges. LE = Federally-listed endangered (n = 11), LT = Federally-listed threatened (n = 5), SSC = State listed species of special concern (n = 18), unlisted (n = 314).

A more meaningful evaluation of the ASRS to adequately identify taxa of concern was a comparison of median biological scores to NatureServe’s conservation status ranking system. The NatureServe ranking system designates the conservation status of a taxon by a number ranging from 1 to 5 (1 = critically imperiled to 5 = demonstrably widespread, abundant, and secure), preceded by a letter reflecting the appropriate geographic scale of the assessment (G = Global, S = Subnational; see Appendix V for full definitions of the categories). G ranks consider the relative imperilment of a taxon across its global range, while S ranks consider the status of the taxa only within the state. In contrast to state and federal threatened, endangered and SSC designations, G and S ranks allow for comparisons among a range of status designations and conditions (i.e. critically imperiled to vulnerable to secure). S ranks are based on status only within Alaska, avoiding a comparison with designations that are based on status at the global

scale. Consequently, we would expect S ranks to provide the best comparison to the ASRS biological scores, which also scored criteria according to status only within the state.

A histogram comparison of the ASRS scores versus NatureServe ranks revealed an increase in median biological scores from global and state critically imperiled (G1, S1) and imperiled (G2, S2) through taxa considered secure (G4, G5, S4, S5; Figure 3). A Kruskal-Wallis rank sum test provided further support for a difference in biological scores among G ( $\chi^2 = 114.2$ ,  $p < 0.00$ ) and S ( $\chi^2 = 131.0$ ,  $p < 0.00$ ) ranks. This analysis indicated that the ASRS followed a similar pattern observed in a well known and accepted ranking system and accurately represented the relative status of taxa across a wide range of status conditions. Deviations within G and S rank categories and overlap between categories may indicate that some taxa are more vulnerable than previously perceived and may warrant further investigation.

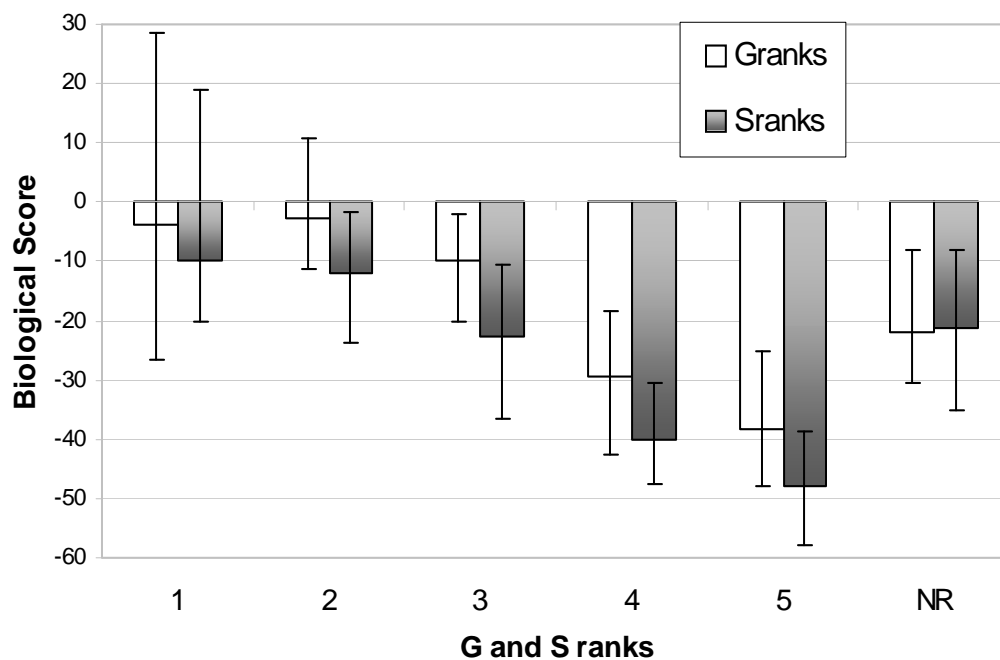


Figure 3. Histogram of median biological scores for NatureServe's global and state ranks from G1 to G5 and S1 to S5. Error bars are interquartile ranges. Categories are G1 = critically imperiled globally (n = 5), S1 = critically imperiled in Alaska (n = 9), G2 = imperiled globally (n = 18), S2 = imperiled in Alaska (n = 66), G3 = vulnerable globally (n = 59), S3 = vulnerable in Alaska (n = 105), G4 = apparently secure globally (n = 32), S4 = apparently secure in Alaska (n = 62), G5 = secure globally (n = 194), S5 = secure in Alaska (n = 65), GNR = not ranked globally (n = 31), SNR = not ranked in Alaska (n = 32).

### Action Scores

A histogram comparison of the median action scores and a Kruskal-Wallis rank sum test revealed that federal- and state-listed taxa had lower action scores than unlisted taxa ( $\chi^2 = 42.4$ ,  $p < 0.00$ ; Figure 4). This trend was expected and likely reflects the higher funding allocations and/or research efforts directed toward taxa of known concern.

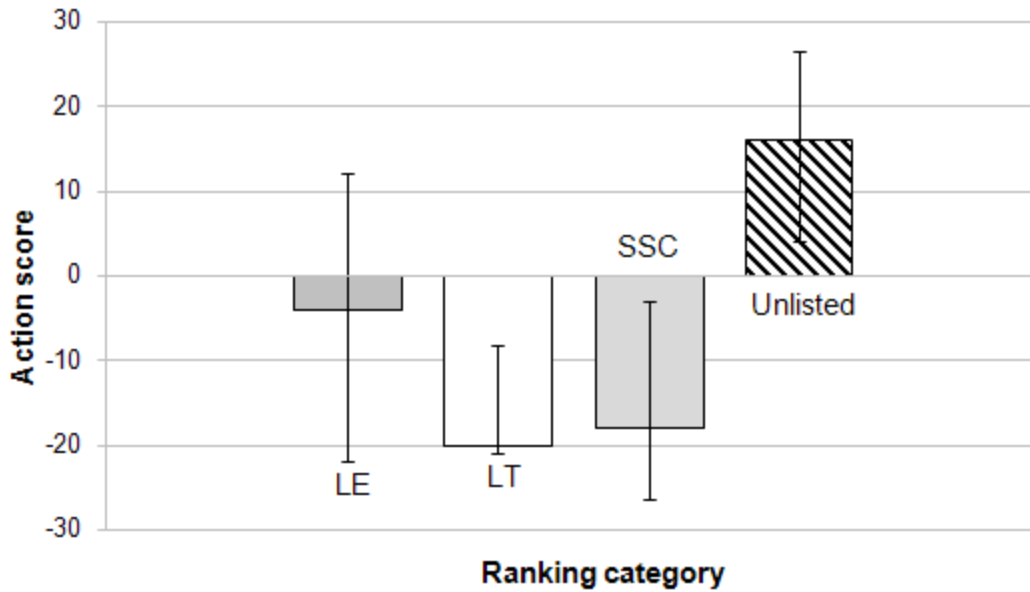


Figure 4. Histogram of median action scores for federal- and state-listed taxa. Error bars are interquartile ranges. LE = Federally-listed endangered (n = 11), LT = Federally-listed threatened (n = 5), SSC = State-listed species of special concern (n = 18), unlisted (n = 314).

## Comparisons among Taxa

To assess whether there were trends in scores among higher taxonomic categories, we compared biological and action scores among the three classes: birds, mammals and amphibians. It is important to note that within the nominee list, there were likely preexisting taxonomic biases which may have affected these results. For example, the mammal nominee list was heavily weighted towards small endemic and marine mammals while large terrestrial mammals were under-represented. Most orders and families of birds were well represented, with the exception of waterfowl (family Anatidae).

### *Biological Scores*

Overall, median biological scores ranged from -15.0 to -35.0 for all taxa (Figure 5). Within class variation is represented by the broad overlap of interquartile ranges. Biological scores were higher for mammals ( $m_d = -15.0$ ; range = -64.0, 42.0; n = 122; U = 8381.0,  $p < 0.00$ ) compared to birds ( $m_d = -35.0$ ; range = -72.0, 27.0; n = 213). While median biological scores were also lower for amphibians ( $m_d = -30.5$ ; range = -70.2, -9.0; n = 6), a small sample size likely precluded a significant Mann-Whitney rank sum test (U = 624.5,  $p = 0.93$ ).

We attributed the higher biological scores for mammals to a high proportion of endemic mammal species and subspecies included in the ranking (46% of mammals compared to 7% of birds and 0% of amphibians). Because of this apparent disparity, we wanted to test the assumption that differences in biological scores were influenced by the high proportion of endemic mammals on the nominee species list. To do so, we removed all endemic taxa from the analysis and then

compared biological scores for the remaining mammals and birds (Figure 5). With endemic taxa removed, no significant differences in rank sums of biological scores were observed between birds ( $m_d = -36.4$ ;  $n = 199$ ;  $U = 5899.0$ ,  $p = 0.22$ ) and mammals ( $m_d = -31.5$ ;  $n = 66$ ).

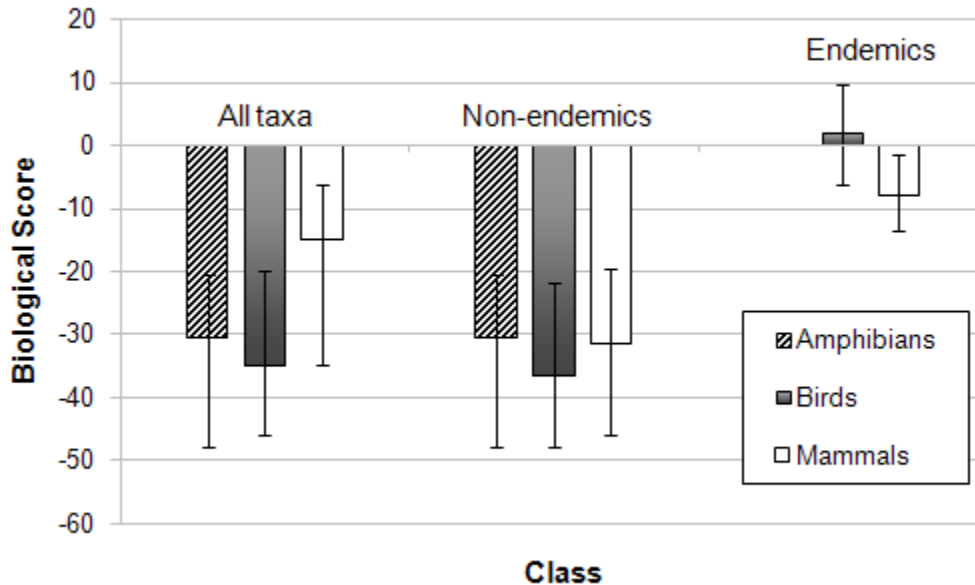


Figure 5. Histogram of median biological scores for all birds ( $n = 213$ ), all amphibians ( $n = 6$ ), all mammals ( $n = 122$ ), non-endemic birds ( $n = 199$ ), non-endemic amphibians ( $n = 6$ ), non-endemic mammals ( $n = 66$ ), endemic birds ( $n = 14$ ), and endemic mammals ( $n = 56$ ). Error bars are interquartile ranges.

Millsap et al. (1990) reported that two biological variables, population size and reproductive potential, were of questionable comparability across class boundaries. To determine how these variables affected biological scores and whether or not they were responsible for taxonomically biasing the ASRS, we repeated the above analysis using an adjusted biological score that excluded population size and reproductive potential (for non-endemic taxa only; Figure 6). Adjusted biological score medians for mammals ( $m_d = -29.1$ ;  $n = 66$ ) and amphibians ( $m_d = -27.0$ ;  $n = 6$ ) decreased in rough proportion to the deleted variables. The adjusted biological score median for birds ( $m_d = -30.0$ ;  $n = 199$ ) decreased in greater proportion to the deleted variables indicating that there may be a small bias reducing biological scores for birds attributable to one or both of these variables. A Mann-Whitney rank sum test revealed that population size scores were lower for birds compared to mammals ( $U = 5179.5$ ,  $p = 0.007$ ) due to higher avian population sizes. Predicted differences in reproductive potential did not occur ( $\chi^2 = 3.7$ ,  $p = 0.16$ ). This is likely due to the high proportion of small mammals included in the ranking system, which have a high fecundity and low minimum age at first reproduction

We conclude that the high number of endemic small mammals included in the ranking accounted for most of the between class differences in biological scores observed between mammals and birds. However, the variable population size disproportionately reduced biological scores for birds compared to mammals. At this juncture, we suggest retaining all variables until all

vertebrate taxa can be scored and included in the analysis and a fair assessment of taxonomic bias can be conducted.

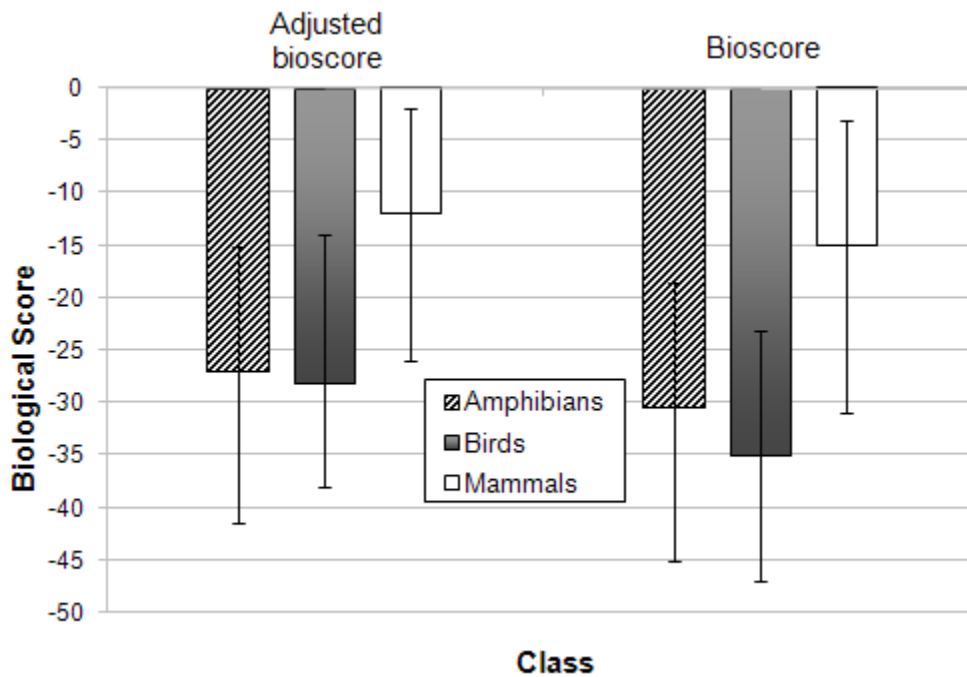


Figure 6. Histogram of biological scores and adjusted biological scores for non-endemic birds (n = 199), amphibians (n = 6), and mammals (n = 66).

### Action Scores

Median action scores for all classes ranged from 10.0 to 22.0. By class, birds had the lowest action scores ( $m_d = 10.0$ ; range = -32.0, 34.0;  $n = 213$ ;  $\chi^2 = 23.45$ ,  $p < 0.00$ ) due to the abundance of information available on many species and the legal protection afforded by the Migratory Bird Treaty Act (1918). Action scores for mammals ( $m_d = 22.0$ ; range = -40.0, 40.0;  $n = 122$ ;  $U = 8946.5$ ,  $p < 0.00$ ) were higher. While medians action scores for amphibians ( $m_d = 20.0$ ; range = -2.0, 32.0;  $n = 6$ ) were also higher, a small sample size likely precluded a significant Mann-Whitney rank sum test ( $U = 429.5$ ,  $p = 0.170$ ). Within class variation is represented by the broad overlap of interquartile ranges (Figure 7).

To test the assumption that differences in action scores were due to the high proportion of endemic mammals in the ranking system, we compared action scores of mammals and birds excluding endemic taxa (Figure 7). By removing endemic taxa from the comparison, differences in action scores between birds ( $m_d = 12.0$ ;  $n = 199$ ;  $U = 0.633$ ,  $p = 0.41$ ) and mammals ( $m_d = 12.0$ ;  $n = 66$ ) were eliminated.

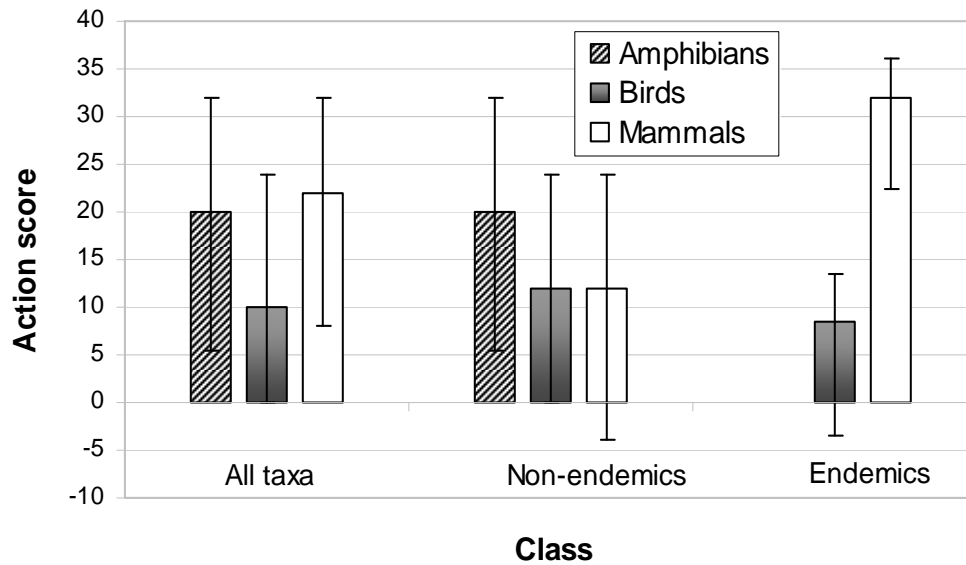


Figure 7. Histogram of median action scores for all birds (n = 213), all amphibians (n = 6), all mammals (n = 122), non-endemic birds (n = 199), non-endemic amphibians (n = 6), non-endemic mammals (n = 66), endemic birds (n = 14), and endemic mammals (n = 56). Error bars are interquartile ranges.

Within action scores, a histogram comparison revealed small differences among classes for the individual action criteria (Figure 8). However, large interquartile ranges demonstrated high within class variation suggesting that evaluation of action scores at the class level was too coarse to reveal any significant relationships. A comparison of action scores below the class level (i.e. within or between Order or Family) may be more meaningful. When analyzed using Mann-Whitney rank sum tests, the only statistically significant difference among classes for individual action scores was a higher management score for mammals compared to birds ( $U = 4850.5$ ,  $p < 0.00$ ). Again, this difference was likely due to the high degree of legal protection afforded to most birds by the Migratory Bird Treaty Act.



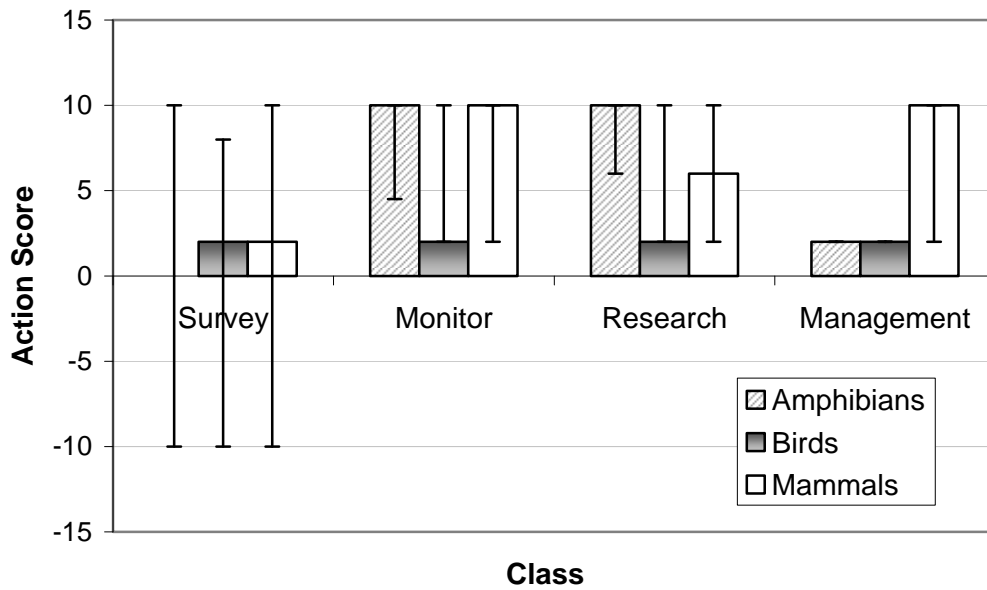


Figure 8. Histogram of median scores for individual action scores of amphibians (n = 6), birds (n = 213), and mammals (n = 122). Categories are survey, monitor, research, and management scores. Error bars are interquartile ranges.

When endemic taxa were removed from this comparison, several small differences in individual action scores remained, but the large amount of within class variation was retained (Figure 9). Rank sums for management were still higher for mammals compared to birds ( $U = 4850.5$ ,  $p < 0.00$ ). There were no other differences in rank sums among classes for individual action scores.

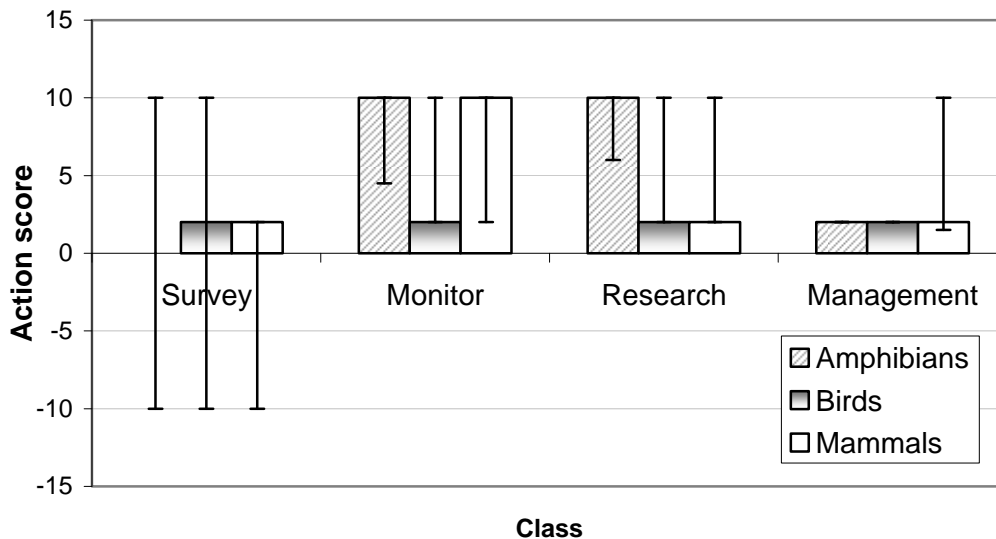


Figure 9. Histogram of median scores for individual action scores of non-endemic amphibians (n = 6), birds (n = 213), and mammals (n = 122). Categories are survey, monitor, research, and management scores. Error bars are interquartile ranges.

## Criteria Considerations and Suggestions

### *Productivity, Survival and Longevity*

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During the review of the ranking criteria, there was some concern that average number of eggs or live young produced annually and age at first breeding did not adequately reflect reproductive potential because it did not capture offspring survival. Despite some resistance from reviewers, we elected to use the same reproductive potential criteria as employed by Millsap et al. (1990) and others (Lunney et al. 1996, Garrett and Wright 2000, Baldi et al. 2001). Millsap et al. (1990) acknowledged that reproductive potential would be better represented by including a productivity variable, but recognized that this type information was not consistently available across taxa. Instead, reproductive potential, as defined by Millsap et al. (1990), was used as an indicator of a taxon's ability to rebound following a decline. For example, an amphibian that produces several hundred offspring will likely rebound much faster than a mammal that produces one or two offspring every other year.

The biological criteria also failed to reflect adult survival and longevity. These important life history attributes contribute to differences in biological vulnerability among taxa and are relevant to the interpretation of population size. While we acknowledge that the inclusion of a variable to score survival and longevity could potentially improve the ranking system, longevity and survival are largely unknown for most taxa. We felt that trying to answer questions about survival and longevity would do little to improve upon the ability to distinguish fine differences in status.

### *Peripheral Designation*

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The category "Peripheral taxa" was included as a sorting variable to safeguard against producing misleading results by using straight biological and action scores for management decision making. As expected, peripheral populations of globally widespread and secure species received some of the highest biological and action scores. High biological scores were often due to restricted range sizes and small population sizes and the high action scores were often due to the lack of survey, monitoring, research, and/or management efforts.

In contrast, conservation and research efforts for some taxa designated as peripheral may be unequivocally warranted. Such cases may arise when: 1) taxa are rare or endangered in the core of their range, but secure at the periphery; 2) environmental changes result in range shifts from periphery to core; 3) inventories reveal that a taxa is more widespread than previously perceived; 4) taxa on the periphery of their range are numerically significant; or 5) the peripheral population contributes to the genetic diversity of the taxa. To determine the importance of peripheral populations to the long-term survival of the taxa and to make well-informed management decisions, it is imperative to consider population size, status elsewhere, changing environmental conditions, knowledge regarding distribution, and evolutionary significance (Fraser 2000).

## Using the ASRS as a Conservation Decision Support Tool

To provide ADF&G with an alternative mechanism for evaluating top candidates for conservation action other than just straight biological or action scores (as presented in Appendix III and IV, respectively), we devised a categorical approach that used action and biological scores and supplemental variables to answer a variety of questions regarding the conservation of Alaska's wildlife. Although the categorical approach used a combination of biological and action scores to identify candidate taxa for conservation action, biological and action scores remained independent and were not summed. Biological and action scores were designated as low (1/3 lowest scores), moderate (1/3 middle scores), or high (1/3 highest scores), then used in combination to satisfy the following criteria:

**Category I - High need.** Taxa in this category have moderate to high biological vulnerability and are in moderate to high action need. Alaska also has high global stewardship responsibility to these taxa with greater than 25% of the global population occurring in the state.

**Category II - High biological vulnerability.** Taxa in this category have moderate to high biological vulnerability, but low action scores. Alaska also has high global stewardship responsibility to these taxa with greater than 25% of the global population occurring in the state.

**Category III - High action need.** Taxa in this category have moderate to high action scores, but low biological scores. Alaska also has high global stewardship responsibility to these taxa with greater than 25% of the global population occurring in the state.

**Category IV - Low need.** Taxa in this category have low biological and low action scores denoting low biological vulnerability and low need for action.

**Category V - Peripheral.** Taxa in this category are regarded as peripheral. Peripheral taxa are defined as taxa that are on the edge of their range with less than 10% of their global range known to occur in Alaska.

**Category VI - Migrants with small population sizes.** Taxa that migrate through Alaska in very small numbers (< 1,000) and have less than 25% of global population in Alaska.

Category classifications were calculated for all taxa (Table 7) and also for taxa at the species level only (Table 8).

Table 7. Category classification for all ranked nominee taxa including endemics (listed in Appendix III). **Category I** = moderate to high biological and action scores with greater than 25% of global population in Alaska, **Category II** = moderate to high biological vulnerability, but low action scores with greater than 25% of global population in Alaska, **Category III** = moderate to high action scores, but low biological vulnerability with greater than 25% of global population in Alaska, **Category IV** = low biological and action scores, **Category V** = peripheral taxa, **Category VI** = taxa that migrate through Alaska in very small numbers (<1,000) with less than 25% of global population in Alaska. Within categories, taxa are listed in order of decreasing biological scores with biological and action scores expressed as percentage of taxa that rank below them. High biological scores indicate greater vulnerability to extirpation based on a taxon's distribution, abundance and life history. High action scores denote poorly known, unmanaged taxa and are based on current state of knowledge and extent of conservation efforts directed toward a given taxon within Alaska.

| <b>Category I: Moderate to high biological and action scores with &gt; 25% of global population in Alaska.</b> |                   |               |
|--|-------------------|---------------|
| <b>Taxa</b>  | <b>Biological</b> | <b>Action</b> |
| Hoary marmot, Montague Island  | 97%               | 81%           |
| Arctic ground squirrel, Osgood's   | 96%               | 94%           |
| Glacier Bay water shrew  | 95%               | 97%           |
| Hoary marmot, Glacier Bay  | 95%               | 97%           |
| Brown lemming, black-footed  | 95%               | 65%           |
| Arctic ground squirrel, Kodiak Island  | 94%               | 94%           |
| Spruce Grouse, Prince of Wales   | 94%               | 65%           |
| Root vole, Shumagin Island   | 92%               | 97%           |
| Collared lemming, St. Lawrence Island  | 92%               | 94%           |
| Beaver, Admiralty  | 92%               | 42%           |
| Kittlitz's Murrelet  | 92%               | 42%           |
| Winter Wren, Pribilof  | 91%               | 41%           |
| Ermine, Admiralty Island   | 91%               | 65%           |
| Root vole, Montague Island   | 91%               | 61%           |
| Collared lemming, Unalaska   | 89%               | 94%           |
| Collared lemming, Stevenson's  | 89%               | 94%           |
| River otter, Prince of Wales   | 89%               | 65%           |
| Root vole, Penuk Island  | 88%               | 65%           |
| Insular vole, Hall Island  | 87%               | 97%           |
| Rock Sandpiper, Aleutian   | 87%               | 65%           |
| Dusky shrew, Warren Island   | 87%               | 77%           |
| Keen's myotis  | 87%               | 81%           |
| Long-tailed vole, Coronation Island  | 87%               | 81%           |
| Sei whale, North Pacific   | 86%               | 42%           |
| Northwestern deer mouse, sitkensis   | 86%               | 81%           |
| Brown lemming, Nunivak Island  | 84%               | 81%           |
| Alaskan hare, podromus   | 84%               | 81%           |
| Arctic ground squirrel, St. Lawrence Island  | 84%               | 97%           |
| Ermine, Suemez Island  | 84%               | 51%           |
| Northern red-backed vole, Island   | 81%               | 65%           |

Table 7, continued.

**Category I:** Moderate to high biological and action scores with > 25% of global population in Alaska.

| <b>Taxa</b>                                    | <b>Biological</b> | <b>Action</b> |
|--|-------------------|---------------|
| Root vole, St. Lawrence Island                 | 81%               | 81%           |
| Root vole, Sitka                               | 81%               | 81%           |
| Collared lemming, peninsulae                   | 81%               | 94%           |
| Northwestern deer mouse, oceanicus             | 81%               | 81%           |
| Marten, Kenai                                  | 80%               | 77%           |
| Insular vole, St. Mathew Island                | 78%               | 97%           |
| Surfbird                                       | 78%               | 51%           |
| Red squirrel, Kenai                            | 78%               | 65%           |
| Northern red-backed vole, Glacier Bay          | 78%               | 65%           |
| Root vole, Yakutat                             | 78%               | 81%           |
| Ermine, Baranof                                | 77%               | 51%           |
| Wolf, Alexander Archipelago                    | 76%               | 42%           |
| Arctic ground squirrel, Shumagin Islands       | 76%               | 94%           |
| Marbled Murrelet                               | 76%               | 42%           |
| Alaskan hare                                   | 76%               | 50%           |
| Rock Sandpiper, Bering Sea                     | 74%               | 65%           |
| Merlin, Black                                  | 74%               | 41%           |
| Baird's beaked whale, Alaska                   | 71%               | 42%           |
| Pribilof Island shrew                          | 71%               | 42%           |
| Winter Wren, Kiska                             | 71%               | 40%           |
| Dusky shrew, Yakutat                           | 71%               | 65%           |
| Stejneger's beaked whale, Alaska               | 71%               | 81%           |
| Northern red-backed vole, St. Lawrence Island  | 71%               | 81%           |
| Southern red-backed vole, Wrangell Island      | 71%               | 94%           |
| Southern red-backed vole, Revillagigedo Island | 71%               | 94%           |
| Great Blue Heron, Pacific                      | 70%               | 42%           |
| Insular vole                                   | 69%               | 97%           |
| Winter Wren, Attu                              | 69%               | 40%           |
| Root vole, Unalaska                            | 67%               | 97%           |
| Northern red-backed vole, Orca                 | 67%               | 81%           |
| Meadow vole, Admiralty                         | 63%               | 81%           |
| Northwestern deer mouse, hylaeus               | 63%               | 64%           |
| Dunlin, Pacific                                | 59%               | 61%           |
| Winter Wren, Kodiak                            | 59%               | 60%           |
| Alaska tiny shrew                              | 59%               | 81%           |
| St. Lawrence Island shrew                      | 54%               | 81%           |
| Dusky shrew, Queen Charlotte Islands           | 54%               | 42%           |
| Southern red-backed vole, Gapper's             | 54%               | 94%           |
| Alaska marmot                                  | 52%               | 81%           |
| Long-tailed vole, littoralis                   | 52%               | 77%           |

Table 7, continued.

**Category I:** Moderate to high biological and action scores with > 25% of global population in Alaska.

| <b>Taxa</b>                         | <b>Biological</b> | <b>Action</b> |
|-------------------------------------|-------------------|---------------|
| Northwestern deermouse, algidus     | 49%               | 64%           |
| Red squirrel, Kupreanof             | 49%               | 42%           |
| Northwestern deermouse, macrorhinus | 49%               | 64%           |
| Gray whale, Eastern Pacific         | 42%               | 42%           |
| Collared pika                       | 42%               | 64%           |
| Wandering Tattler                   | 41%               | 65%           |
| Arctic ground squirrel, Aleutian    | 40%               | 77%           |
| Golden-crowned Sparrow              | 38%               | 65%           |
| Bearded seal                        | 37%               | 51%           |
| Tundra shrew                        | 34%               | 97%           |
| Lesser Yellowlegs                   | 34%               | 51%           |

**Category II:** Moderate to high biological scores, but low action scores with > 25% of global population in Alaska.

|  |      |     |
|--|------|-----|
| Beluga whale, Cook Inlet population              | 100% | 0%  |
| Brown bear, Kenai population                     | 99%  | 2%  |
| Steller's Eider                                  | 99%  | 21% |
| North Pacific right whale, Eastern North Pacific | 98%  | 21% |
| Rock Ptarmigan, Evermann's                       | 98%  | 4%  |
| White-fronted Goose, Tule                        | 98%  | 24% |
| Cackling Goose, Aleutian                         | 97%  | 1%  |
| Rock Ptarmigan, Turner's                         | 97%  | 11% |
| Northern flying squirrel, Prince of Wales        | 96%  | 11% |
| Rock Ptarmigan, Townsend's                       | 96%  | 11% |
| Rock Sandpiper, Pribilof                         | 94%  | 33% |
| Song Sparrow, Aleutian                           | 92%  | 25% |
| McKay's Bunting                                  | 92%  | 25% |
| Winter Wren, Semidi                              | 92%  | 20% |
| Red-legged Kittiwake                             | 91%  | 32% |
| Woodland caribou, Chisana herd                   | 89%  | 0%  |
| Western Sandpiper                                | 84%  | 25% |
| Northern fur seal                                | 81%  | 9%  |
| Alaskan hare, othus                              | 81%  | 24% |
| Goshawk, Queen Charlotte                         | 80%  | 5%  |
| Bowhead, Western Arctic                          | 80%  | 1%  |
| Ermine, Prince of Wales                          | 77%  | 33% |
| Walrus   | 77%  | 5%  |
| Root vole, Amak Island                           | 74%  | 25% |
| Bristle-thighed Curlew                           | 74%  | 25% |
| Peregrine Falcon, Peale's                        | 74%  | 33% |
| Ribbon seal                                      | 65%  | 14% |

Table 7, continued.

**Category II:** Moderate to high biological scores, but low action scores with > 25% of global population in Alaska.

| <b>Taxa</b>                              | <b>Biological</b> | <b>Action</b> |
|--|-------------------|---------------|
| Black Oystercatcher                      | 65%               | 14%           |
| Fork-tailed Storm-Petrel, furcata        | 59%               | 1%            |
| Dunlin, Arctic                           | 59%               | 14%           |
| Steller sea lion, Western U.S. stock     | 56%               | 1%            |
| Surf Scoter                              | 56%               | 33%           |
| Horned Grebe                             | 56%               | 32%           |
| Least Auklet                             | 54%               | 5%            |
| Black Turnstone                          | 52%               | 25%           |
| Whiskered Auklet                         | 51%               | 5%            |
| Spotted seal                             | 51%               | 25%           |
| Bald Eagle                               | 50%               | 1%            |
| Ermine, Kodiak Island                    | 50%               | 33%           |
| Crested Auklet                           | 49%               | 5%            |
| Northern sea otter, SW Alaska population | 48%               | 2%            |
| Canadian lynx                            | 47%               | 5%            |
| Aleutian Tern                            | 47%               | 9%            |
| Arctic Tern                              | 45%               | 21%           |
| Long-tailed Duck                         | 45%               | 21%           |
| Three-toed Woodpecker                    | 42%               | 14%           |
| Peregrine Falcon, American               | 38%               | 14%           |
| Pigeon Guillemot                         | 37%               | 14%           |
| Northern Hawk-owl                        | 37%               | 33%           |
| Chestnut-backed Chickadee                | 34%               | 14%           |
| Common Eider, Pacific                    | 34%               | 9%            |
| Rusty Blackbird                          | 34%               | 21%           |

**Category III:** Moderate to high action need, but low biological scores with > 25% of global population in Alaska.

|                                |     |     |
|--------------------------------|-----|-----|
| Short-billed Dowitcher         | 29% | 65% |
| Northwestern deer mouse        | 14% | 41% |
| Fox Sparrow                    | 13% | 51% |
| Arctic ground squirrel, Barrow | 10% | 61% |
| American Golden-plover         | 8%  | 42% |
| Dusky shrew                    | 8%  | 42% |
| Singing vole                   | 6%  | 42% |
| White-crowned Sparrow          | 6%  | 51% |
| Northwestern Crow              | 2%  | 42% |

**Category IV:** Low action and biological scores regardless of proportion of global population.

|                    |     |     |
|--------------------|-----|-----|
| Common Loon        | 33% | 25% |
| Rufous Hummingbird | 32% | 14% |

Table 7, continued.

**Category IV:** Low action and biological scores regardless of proportion of global population.

| <b>Taxa</b>                                       | <b>Biological</b> | <b>Action</b> |
|---|-------------------|---------------|
| Ringed seal                                       | 30%               | 5%            |
| Steller sea lion, Eastern U.S. stock              | 30%               | 4%            |
| Blackpoll Warbler                                 | 30%               | 25%           |
| Yellow-billed Loon                                | 27%               | 14%           |
| Peregrine Falcon, Arctic                          | 27%               | 5%            |
| Double-crested Cormorant                          | 27%               | 20%           |
| Osprey  | 26%               | 33%           |
| Northern sea otter, all 3 AK stocks               | 26%               | 2%            |
| Leach's Storm-petrel                              | 26%               | 5%            |
| Gray-cheeked Thrush                               | 24%               | 14%           |
| Red-breasted Sapsucker                            | 24%               | 11%           |
| Wilson's Warbler                                  | 24%               | 33%           |
| Boreal Owl  | 24%               | 33%           |
| Buff-breasted Sandpiper                           | 24%               | 25%           |
| Harbor seal                                       | 20%               | 11%           |
| Varied Thrush                                     | 20%               | 21%           |
| Pacific-slope Flycatcher                          | 20%               | 33%           |
| Humpback whale, Central and Western North Pacific | 20%               | 2%            |
| Red-throated Loon                                 | 19%               | 14%           |
| Harbor porpoise                                   | 19%               | 33%           |
| White-winged Crossbill                            | 14%               | 14%           |
| Pacific Loon                                      | 14%               | 14%           |
| American Dipper                                   | 14%               | 24%           |
| Black-bellied Plover                              | 14%               | 21%           |
| Olive-sided Flycatcher                            | 14%               | 33%           |
| Merlin  | 14%               | 24%           |
| Northern Waterthrush                              | 13%               | 25%           |
| Peregrine Falcon                                  | 13%               | 5%            |
| Boreal Chickadee                                  | 13%               | 33%           |
| Arctic ground squirrel                            | 12%               | 33%           |
| Bank Swallow                                      | 10%               | 25%           |
| Pine Siskin                                       | 10%               | 25%           |
| Thick-billed Murre                                | 10%               | 14%           |
| Bohemian Waxwing                                  | 8%                | 25%           |
| Red-necked Phalarope                              | 8%                | 25%           |
| Common Murre                                      | 6%                | 14%           |
| Pelagic Cormorant                                 | 6%                | 20%           |
| Pacific Golden-plover                             | 6%                | 25%           |
| Sooty Grouse                                      | 5%                | 33%           |
| Hairy Woodpecker                                  | 5%                | 9%            |



Table 7, continued.

**Category IV:** Low action and biological scores regardless of proportion of global population.

| <b>Taxa</b>              | <b>Biological</b> | <b>Action</b> |
|--------------------------|-------------------|---------------|
| Swainson's Thrush        | 4%                | 14%           |
| Hammond's Flycatcher     | 4%                | 33%           |
| Ermine                   | 4%                | 14%           |
| Northern red-backed vole | 2%                | 25%           |
| Hermit Thrush            | 1%                | 25%           |
| Cliff Swallow            | 1%                | 33%           |
| Wood frog                | 0%                | 33%           |
| American Robin           | 0%                | 11%           |

**Category V:** Peripheral (edge of range with < 10% of global range in Alaska).

|                       |     |     |
|-----------------------|-----|-----|
| Slaty-backed Gull     | 96% | 81% |
| California myotis     | 90% | 81% |
| American Coot         | 89% | 81% |
| Gray-tailed Tattler   | 86% | 81% |
| Sanderling            | 84% | 81% |
| Black Guillemot       | 84% | 60% |
| Columbia spotted frog | 80% | 81% |
| Arctic Loon           | 78% | 65% |
| Dovekie               | 78% | 65% |
| Long-legged myotis    | 75% | 77% |
| Marten, Pacific       | 74% | 25% |
| Ring-billed Gull      | 73% | 81% |
| Ivory Gull            | 71% | 94% |
| Red Knot              | 69% | 42% |
| Black Swift           | 69% | 65% |
| California Gull       | 69% | 81% |
| Western Screech-Owl   | 68% | 33% |
| Brambling             | 67% | 65% |
| Killdeer              | 67% | 61% |
| Sky Lark              | 65% | 77% |
| Caspian Tern          | 63% | 11% |
| Bar-tailed Godwit     | 63% | 21% |
| Black Scoter          | 63% | 14% |
| Eurasian Dotterel     | 62% | 81% |
| Lesser Sand-Plover    | 62% | 81% |
| American Bittern      | 61% | 65% |
| Tennessee Warbler     | 59% | 51% |
| Band-tailed Pigeon    | 59% | 65% |
| Buller's Shearwater   | 59% | 81% |
| Silver-haired bat     | 56% | 65% |

Table 7, continued.

**Category V:** Peripheral (edge of range with < 10% of global range in Alaska).

| <b>Taxa</b>                   | <b>Biological</b> | <b>Action</b> |
|-------------------------------|-------------------|---------------|
| Long-toed salamander          | 56%               | 77%           |
| Northwestern salamander       | 51%               | 81%           |
| Northern Saw-whet Owl         | 50%               | 33%           |
| Northern Pygmy-owl            | 50%               | 51%           |
| Red-winged Blackbird          | 50%               | 65%           |
| Red-eyed Vireo                | 47%               | 65%           |
| Upland Sandpiper              | 45%               | 81%           |
| Sora                          | 44%               | 81%           |
| Roughskin newt                | 44%               | 42%           |
| Vaux's Swift                  | 44%               | 51%           |
| Red Crossbill                 | 42%               | 33%           |
| Yellow-bellied Sapsucker      | 42%               | 65%           |
| American Crow                 | 42%               | 77%           |
| White-rumped Sandpiper        | 40%               | 51%           |
| Ross's Gull                   | 40%               | 81%           |
| Swainson's Hawk               | 40%               | 77%           |
| Barred Owl                    | 38%               | 50%           |
| Brown-headed Cowbird          | 36%               | 65%           |
| Barn Swallow                  | 34%               | 51%           |
| Pied-billed Grebe             | 33%               | 81%           |
| American Redstart             | 30%               | 51%           |
| Southern red-backed vole      | 30%               | 77%           |
| Western toad                  | 29%               | 20%           |
| Red-breasted Nuthatch         | 27%               | 33%           |
| White Wagtail                 | 27%               | 81%           |
| Brown Creeper                 | 24%               | 9%            |
| Northern Rough-winged Swallow | 24%               | 77%           |
| Western Wood-pewee            | 23%               | 25%           |
| Anna's Hummingbird            | 23%               | 65%           |
| Golden-crowned Kinglet        | 20%               | 9%            |
| Water shrew                   | 18%               | 81%           |
| Townsend's Warbler            | 14%               | 33%           |
| Arctic Warbler                | 14%               | 42%           |
| Mountain Bluebird             | 14%               | 60%           |
| Western Tanager               | 14%               | 81%           |
| Bluethroat                    | 10%               | 81%           |
| Townsend's Solitaire          | 10%               | 65%           |
| Long-tailed vole              | 8%                | 61%           |
| Sharp-tailed Sandpiper        | 5%                | 81%           |
| Steller's Jay                 | 4%                | 51%           |

Table 7, continued.

**Category V:** Peripheral (edge of range with < 10% of global range in Alaska).

| <b>Taxa</b>            | <b>Biological</b> | <b>Action</b> |
|------------------------|-------------------|---------------|
| MacGillivray's Warbler | 3%                | 61%           |
| Common Tern            | 81%               | 65%           |
| Ruff                   | 69%               | 65%           |
| Long-toed Stint        | 65%               | 65%           |
| Eye-browed Thrush      | 65%               | 65%           |
| Siberian Rubythroat    | 63%               | 65%           |
| Common Sandpiper       | 63%               | 65%           |
| Eastern Kingbird       | 58%               | 81%           |
| Rustic Bunting         | 56%               | 81%           |
| Black-headed Gull      | 54%               | 65%           |

**Category VI:** Migrate through Alaska in very small numbers (< 1,000) with less than 25% of global population in Alaska.

|                     |     |     |
|---------------------|-----|-----|
| Common Greenshank   | 89% | 65% |
| Common Tern         | 81% | 65% |
| Ruff                | 69% | 65% |
| Long-toed Stint     | 65% | 65% |
| Eye-browed Thrush   | 65% | 65% |
| Siberian Rubythroat | 63% | 65% |
| Common Sandpiper    | 63% | 65% |
| Eastern Kingbird    | 58% | 81% |
| Rustic Bunting      | 56% | 81% |
| Black-headed Gull   | 54% | 65% |

Table 8. Category classification for ranked nominee species only (endemics not included). **Category I** = moderate to high biological and action scores with greater than 25% of global population in Alaska, **Category II** = moderate to high biological vulnerability, but low action scores with greater than 25% of global population in Alaska, **Category III** = moderate to high action scores, but low biological vulnerability with greater than 25% of global population in Alaska, **Category IV** = low biological and action scores, **Category V** = peripheral taxa, **Category VI** = taxa that migrate through Alaska in very small numbers (<1,000) with less than 25% of global population in Alaska. Within categories, taxa are listed in order of decreasing biological scores with biological and action scores expressed as percentage of taxa that rank below them. High biological scores indicate greater vulnerability to extirpation based on a taxon's distribution, abundance and life history. High action scores denote poorly known, unmanaged taxa and are based on current state of knowledge and extent of conservation efforts directed toward a given taxon within Alaska.

| <b>Category I:</b> Moderate to high biological and action scores with > 25% of global population in Alaska.              |                   |               |
|--|-------------------|---------------|
| <b>Taxa</b>  | <b>Biological</b> | <b>Action</b> |
| Glacier Bay water shrew  | 97%               | 99%           |
| Kittlitz's Murrelet  | 96%               | 44%           |
| Red-legged Kittiwake   | 96%               | 34%           |
| Keen's Myotis  | 94%               | 85%           |
| Sei whale, North Pacific   | 93%               | 44%           |
| Surfbird   | 88%               | 55%           |
| Marbled Murrelet   | 88%               | 44%           |
| Alaskan hare   | 87%               | 53%           |
| Baird's beaked whale, Alaska   | 85%               | 44%           |
| Pribilof Island shrew  | 85%               | 44%           |
| Insular vole   | 84%               | 99%           |
| Alaska tiny shrew  | 73%               | 85%           |
| Surf Scoter  | 70%               | 35%           |
| Horned Grebe   | 69%               | 34%           |
| St. Lawrence Island shrew  | 67%               | 85%           |
| Alaska marmot  | 65%               | 85%           |
| Collared pika  | 53%               | 69%           |
| Gray whale, Eastern Pacific  | 53%               | 44%           |
| Wandering Tattler  | 53%               | 70%           |
| Golden-crowned Sparrow   | 49%               | 70%           |
| Bearded seal   | 48%               | 55%           |
| Northern Hawk-owl  | 47%               | 35%           |
| Tundra shrew   | 44%               | 99%           |
| Lesser Yellowlegs  | 44%               | 54%           |
| Short-billed Dowitcher   | 38%               | 70%           |
| <b>Category II:</b> Moderate to high biological scores, but low action scores with > 25% of global population in Alaska. |                   |               |
| Steller's Eider  | 100%              | 21%           |
| North Pacific right whale, Eastern North Pacific   | 98%               | 22%           |
| McKay's Bunting  | 97%               | 26%           |

Table 8, continued.

**Category II:** Moderate to high biological scores, but low action scores with > 25% of global population in Alaska.

| <b>Taxa</b>                         | <b>Biological</b> | <b>Action</b> |
|-------------------------------------|-------------------|---------------|
| Western Sandpiper                   | 92%               | 26%           |
| Northern fur seal                   | 91%               | 8%            |
| Bowhead, Western Arctic             | 90%               | 0%            |
| Walrus                              | 88%               | 3%            |
| Bristle-thighed Curlew              | 87%               | 26%           |
| Ribbon seal                         | 79%               | 13%           |
| Black Oystercatcher                 | 79%               | 13%           |
| Least Auklet                        | 67%               | 3%            |
| Black Turnstone                     | 65%               | 26%           |
| Spotted seal                        | 64%               | 26%           |
| Whiskered Auklet                    | 64%               | 3%            |
| Bald Eagle                          | 62%               | 0%            |
| Crested Auklet                      | 62%               | 3%            |
| Canadian lynx                       | 60%               | 3%            |
| Aleutian Tern                       | 60%               | 8%            |
| Arctic Tern                         | 58%               | 22%           |
| Long-tailed Duck                    | 58%               | 22%           |
| Three-toed Woodpecker               | 53%               | 13%           |
| Pigeon Guillemot                    | 48%               | 13%           |
| Rusty Blackbird                     | 44%               | 22%           |
| Chestnut-backed Chickadee           | 44%               | 13%           |
| Blackpoll Warbler                   | 39%               | 26%           |
| Yellow-billed Loon                  | 36%               | 13%           |
| Northern sea otter, all 3 AK stocks | 35%               | 1%            |
| Leach's Storm-petrel                | 35%               | 3%            |

**Category III:** Moderate to high action need, but low biological scores with > 25% of global population in Alaska.

|                         |     |     |
|-------------------------|-----|-----|
| Wilson's Warbler        | 32% | 35% |
| Northwestern deer mouse | 18% | 43% |
| Fox Sparrow             | 17% | 55% |
| Arctic ground squirrel  | 16% | 35% |
| American Golden-plover  | 11% | 44% |
| Dusky shrew             | 10% | 44% |
| White-crowned Sparrow   | 8%  | 55% |
| Singing vole            | 8%  | 44% |
| Northwestern Crow       | 3%  | 44% |

**Category IV:** Low action and biological scores regardless of proportion of global population.

|                         |     |     |
|-------------------------|-----|-----|
| Gray-cheeked Thrush     | 32% | 13% |
| Red-breasted Sapsucker  | 32% | 10% |
| Buff-breasted Sandpiper | 32% | 26% |

Table 8, continued.

**Category IV:** Low action and biological scores regardless of proportion of global population.

| <b>Taxa</b>                                       | <b>Biological</b> | <b>Action</b> |
|---|-------------------|---------------|
| Varied Thrush                                     | 26%               | 22%           |
| Harbor seal                                       | 26%               | 10%           |
| Humpback whale, Central and Western North Pacific | 26%               | 1%            |
| Red-throated Loon                                 | 26%               | 13%           |
| American Dipper                                   | 19%               | 25%           |
| Black-bellied Plover                              | 19%               | 22%           |
| Pacific Loon                                      | 19%               | 13%           |
| White-winged Crossbill                            | 19%               | 13%           |
| Merlin  | 19%               | 25%           |
| Northern Waterthrush                              | 17%               | 26%           |
| Peregrine Falcon                                  | 17%               | 3%            |
| Pine Siskin                                       | 13%               | 26%           |
| Bank Swallow                                      | 13%               | 26%           |
| Thick-billed Murre                                | 13%               | 12%           |
| Bohemian Waxwing                                  | 11%               | 26%           |
| Red-necked Phalarope                              | 11%               | 26%           |
| Pelagic Cormorant                                 | 8%                | 20%           |
| Common Murre                                      | 8%                | 13%           |
| Pacific Golden-plover                             | 8%                | 26%           |
| Hairy Woodpecker                                  | 6%                | 8%            |
| Swainson's Thrush                                 | 5%                | 13%           |
| Ermine  | 5%                | 13%           |
| Northern red-backed vole                          | 3%                | 26%           |
| Hermit Thrush                                     | 1%                | 26%           |
| American Robin                                    | 0%                | 10%           |

**Category V:** Peripheral (edge of range with < 10% of global range in Alaska).

|                       |     |     |
|-----------------------|-----|-----|
| Slaty-backed Gull     | 98% | 85% |
| California myotis     | 96% | 85% |
| American Coot         | 94% | 85% |
| Gray-tailed Tattler   | 94% | 85% |
| Sanderling            | 92% | 85% |
| Black Guillemot       | 92% | 65% |
| Columbia spotted frog | 90% | 85% |
| Dovekie               | 88% | 70% |
| Arctic Loon           | 88% | 70% |
| Long-legged myotis    | 87% | 81% |
| Ring-billed Gull      | 86% | 85% |
| Ivory Gull            | 85% | 98% |
| Red Knot              | 84% | 44% |

Table 8, continued.

**Category V:** Peripheral (edge of range with < 10% of global range in Alaska).

| <b>Taxa</b>              | <b>Biological</b> | <b>Action</b> |
|--------------------------|-------------------|---------------|
| Black Swift              | 83%               | 70%           |
| California Gull          | 83%               | 85%           |
| Western Screech-Owl      | 82%               | 35%           |
| Brambling                | 81%               | 70%           |
| Killdeer                 | 81%               | 67%           |
| Sky Lark                 | 79%               | 81%           |
| Bar-tailed Godwit        | 77%               | 22%           |
| Caspian Tern             | 77%               | 10%           |
| Black Scoter             | 76%               | 13%           |
| Lesser Sand-Plover       | 75%               | 85%           |
| Eurasian Dotterel        | 75%               | 85%           |
| American Bittern         | 74%               | 70%           |
| Band-tailed Pigeon       | 73%               | 70%           |
| Tennessee Warbler        | 73%               | 54%           |
| Buller's Shearwater      | 72%               | 85%           |
| Silver-haired bat        | 70%               | 70%           |
| Long-toed salamander     | 69%               | 81%           |
| Northwestern salamander  | 64%               | 85%           |
| Red-winged Blackbird     | 63%               | 70%           |
| Northern Pygmy-owl       | 63%               | 55%           |
| Northern Saw-whet Owl    | 63%               | 35%           |
| Red-eyed Vireo           | 61%               | 70%           |
| Upland Sandpiper         | 58%               | 85%           |
| Sora                     | 56%               | 85%           |
| Roughskin newt           | 56%               | 44%           |
| Vaux's Swift             | 56%               | 55%           |
| American Crow            | 53%               | 81%           |
| Yellow-bellied Sapsucker | 53%               | 70%           |
| Red Crossbill            | 53%               | 35%           |
| Ross's Gull              | 51%               | 85%           |
| Swainson's Hawk          | 51%               | 81%           |
| White-rumped Sandpiper   | 51%               | 55%           |
| Barred Owl               | 48%               | 53%           |
| Brown-headed Cowbird     | 47%               | 70%           |
| Barn Swallow             | 44%               | 55%           |
| Pied-billed Grebe        | 43%               | 85%           |
| Southern red-backed vole | 39%               | 81%           |
| American Redstart        | 39%               | 55%           |
| Western toad             | 39%               | 20%           |
| White Wagtail            | 36%               | 85%           |

Table 8, continued.

**Category V:** Peripheral (edge of range with < 10% of global range in Alaska).

| <b>Taxa</b>                   | <b>Biological</b> | <b>Action</b> |
|-------------------------------|-------------------|---------------|
| Red-breasted Nuthatch         | 36%               | 35%           |
| Northern Rough-winged Swallow | 32%               | 81%           |
| Brown Creeper                 | 32%               | 8%            |
| Anna's Hummingbird            | 31%               | 70%           |
| Western Wood-pewee            | 31%               | 26%           |
| Golden-crowned Kinglet        | 26%               | 8%            |
| Water shrew                   | 24%               | 85%           |
| Western Tanager               | 19%               | 85%           |
| Mountain Bluebird             | 19%               | 65%           |
| Arctic Warbler                | 19%               | 44%           |
| Townsend's Warbler            | 19%               | 35%           |
| Bluethroat                    | 13%               | 85%           |
| Townsend's Solitaire          | 13%               | 70%           |
| Long-tailed vole              | 11%               | 67%           |
| Sharp-tailed Sandpiper        | 7%                | 85%           |
| Steller's Jay                 | 6%                | 55%           |
| MacGillivray's Warbler        | 4%                | 67%           |
| Common Tern                   | 90%               | 70%           |
| Ruff                          | 83%               | 70%           |
| Eye-browed Thrush             | 79%               | 70%           |
| Long-toed Stint               | 79%               | 70%           |
| Common Sandpiper              | 77%               | 70%           |
| Siberian Rubythroat           | 77%               | 70%           |
| Eastern Kingbird              | 72%               | 85%           |
| Rustic Bunting                | 70%               | 85%           |
| Black-headed Gull             | 67%               | 70%           |

**Category VI:** Migrate through Alaska in very small numbers (< 1,000) with less than 25% of global population in Alaska.

|                     |     |     |
|---------------------|-----|-----|
| Common Greenshank   | 94% | 70% |
| Common Tern         | 90% | 70% |
| Ruff                | 83% | 70% |
| Eye-browed Thrush   | 79% | 70% |
| Long-toed Stint     | 79% | 70% |
| Common Sandpiper    | 77% | 70% |
| Siberian Rubythroat | 77% | 70% |
| Eastern Kingbird    | 72% | 85% |
| Rustic Bunting      | 70% | 85% |
| Black-headed Gull   | 67% | 70% |



## Implications for Management

The combination of biological and action scores permit identification of taxa in greatest need of conservation in Alaska. Some of the conservation actions available to ADF&G include providing funding for and/or implementing survey, monitoring and research projects, directing management, and protecting from take or harvest. Results of the ASRS also illustrate the need for additional research on the systematic significance of the many insular endemic subspecies. Here we discuss the implications of rank results on systematic significance and provide examples of how the ASRS can be used to guide conservation decisions in regards to survey, monitoring, research and management.

### *Systematic Status*

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Consistent with the findings of Millsap et al. (1990), geographically restricted subspecies received some of the highest biological scores. These high scores were largely driven by restricted ranges and small population sizes. While we acknowledge that subspecies are an integral component of the overall diversity of the Alaska fauna, we believe that the observed trends in the biological data are meaningful but should be interpreted with some caution. In many cases, subspecific designations were based on slight morphological differences from a small number of specimens, many of which have not been revisited for examination since first described. While recent molecular techniques have elucidated some of these taxonomic uncertainties for small mammals in Southeast Alaska (see Conroy and Cook 2000, Bidlack and Cook 2001, Cook and MacDonald 2001, Cook et al. 2001, MacDonald and Cook 1999, 2007), the majority of small mammal subspecific designations in the state remain questionable. The systematic status of these populations has implications for assessing their management priority. The results of our analyses strongly highlight the need for more comprehensive systematic studies on the endemic/subspecific taxa of Alaska using modern molecular techniques.

### *Using Action Scores to Make Recommendations for Conservation Action*

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Revealing trends in relative state of knowledge can be useful for planning purposes and can be used to determine what aspects of research may be needed in the future. To demonstrate different ways that the ASRS can be utilized for conservation planning, we produced separate lists of taxa in need of investigation based on the individual action criteria: survey, monitoring, and research needs.

1. **Taxa in need of increased survey efforts in Alaska** was devised based on taxa with poorly known distributions (survey score = 10; Table 9).
2. **Taxa in need of increased monitoring efforts in Alaska** was developed for taxa with moderately understood distributions (survey score < 10) but that currently do not have adequate monitoring strategies in place (monitoring score  $\geq$  2; Table 10).
3. **Taxa in need of increased research efforts in Alaska** was formulated for taxa whose limiting factors are not well known (research score = 10) and are also known or suspected to be declining in Alaska (population trend > 2; Table 11).

## Survey and Monitoring

In Alaska, field inventories are unusually expensive due to the logistics associated with a vast, inaccessible, and rugged landscape. As a result, baseline studies and distributional information are lacking and population trends are poorly known for many vertebrate taxa. Survey and monitoring scores can be used to delineate inventory and monitoring priorities for individual taxa or suites of taxa. This will allow for more efficient use of field time and funds by state and federal wildlife management agencies and their partners. If used in combination with the biological variable "range size" (which provides a complete description of the taxon's geographic range) and/or the biological variable "habitat specialization" (which contains detailed habitat descriptions for individual taxa), results could help determine where to target field work instead of selecting survey areas randomly or with little guidance.

Scores for the survey variable revealed that distributions were poorly known for 94 taxa (28%; Table 9). The survey variable indicated that distributional surveys are needed for 3 amphibians (50%), 37 mammals (30%) and 52 birds (24%). Of the 94 total taxa, approximately 30 percent were subspecies, indicating large gaps in our knowledge of small, endemic mammals. Eighteen of the 94 taxa have very small ranges in Alaska (<100 km<sup>2</sup>) and ranges for five taxa were unknown.

Monitoring usually follows survey efforts because monitoring requires more thorough knowledge of distributions in the state (Millsap et al. 1990). We identified 226 taxa in need of population monitoring efforts including: 3 amphibians (50%), 74 mammals (61%) and 149 birds (70%; Table 10). This translates to 66 percent of all taxa ranked, highlighting the fact that current monitoring efforts for vertebrate taxa in Alaska are lacking.

The monitoring needs list (Table 10) can be further refined to prioritize candidate taxa for monitoring programs. For example, a subset of taxa from the monitoring needs list (n = 33) received survey scores of -10 (distribution is well known throughout range in Alaska with knowledge of habitat associations) and monitoring scores of 10 (not currently monitored). We suggest that many of these taxa may be beyond the need for general distributional surveys and are ready for implementation of a monitoring program (Millsap et al. 1990).

## Research

Taxa with populations that are known or suspected to be declining are generally considered priority taxa for management actions. However, before management actions can be successful, something must be known about factors that are limiting the size of the population and whether those factors can be managed or manipulated. If limiting factors are not known, then research about limiting factors should precede management activities (Millsap et al. 1990).

We considered strong candidates for research to be taxa known or suspected to be declining in Alaska and for which limiting factors were not well known. This yielded a list of 28 potentially declining taxa with high research need scores, of which 3 were mammals, 23 were birds, and 2 were amphibians. Of the 23 avian research candidates, 10 (43%) were landbirds and eight (35%) were shorebirds. Overall, it appears that landbirds and shorebirds, in particular, need basic research to identify limiting factors responsible for current or suspected population declines. For taxa that are known or suspected to be declining and have limiting factors that are relatively well

known, the research needs score and justification can be used to guide management aimed at reversing these declines.

Table 9. Taxa in need of increased survey efforts in Alaska, based on poorly known distribution (survey score = 10). Taxa are listed in order of decreasing biological scores with biological scores expressed as a percentage of taxa that rank below them. Range scores were included to demonstrate the spatial extent that requires consideration if statewide monitoring efforts are to be implemented and percent global population scores were included to illustrate the global responsibility that Alaska has for each taxa. Alaska occurrence, systematic significance, and peripheral are supplemental variables.

| <b>Common name</b>                          | <b>Biological score</b> | <b>Range size (km<sup>2</sup>)</b> | <b>% Global population</b> | <b>Alaska occurrence</b> | <b>Systematic significance</b> | <b>Peripheral</b> |
|---|-------------------------|------------------------------------|----------------------------|--------------------------|--------------------------------|-------------------|
| Eskimo Curlew                               | 100%                    | < 100                              | < 25%                      | Breeding                 | Species                        | Yes               |
| Arctic ground squirrel, Osgood's            | 96%                     | < 100                              | Endemic                    | Yearround                | Subspecies                     | No                |
| Slaty-backed Gull                           | 96%                     | < 100                              | < 25%                      | Yearround                | Species                        | Yes               |
| Glacier Bay water shrew                     | 95%                     | < 100                              | Endemic                    | Yearround                | Species                        | No                |
| Hoary marmot, Glacier Bay                   | 95%                     | 101 to 1,000                       | Endemic                    | Yearround                | Subspecies                     | No                |
| Arctic ground squirrel, Kodiak Island       | 94%                     | 101 to 1,000                       | Endemic                    | Yearround                | Subspecies                     | No                |
| Root vole, Shumagin Island                  | 92%                     | 101 to 1,000                       | Endemic                    | Yearround                | Subspecies                     | No                |
| Collared lemming, St. Lawrence Island       | 92%                     | 101 to 1,000                       | Endemic                    | Yearround                | Subspecies                     | No                |
| Beaver, Admiralty                           | 92%                     | 1,001 to 10,000                    | Endemic                    | Yearround                | Subspecies                     | No                |
| Kittlitz's Murrelet                         | 92%                     | 100,001 to 400,000                 | > 90%                      | Yearround                | Species                        | No                |
| Ermine, Admiralty Island                    | 91%                     | 101 to 1,000                       | Endemic                    | Yearround                | Subspecies                     | No                |
| Collared lemming, Stevenson's               | 89%                     | 1,001 to 10,000                    | Endemic                    | Yearround                | Subspecies                     | No                |
| Collared lemming, Unalaska                  | 89%                     | 1,001 to 10,000                    | Endemic                    | Yearround                | Subspecies                     | No                |
| American Coot                               | 89%                     | < 100                              | < 25%                      | Yearround                | Species                        | Yes               |
| Insular vole, Hall Island                   | 87%                     | < 100                              | Endemic                    | Yearround                | Subspecies                     | No                |
| Keen's myotis                               | 87%                     | 10,001 to 100,000                  | 25 to 49%                  | Breeding                 | Species                        | No                |
| Rock Sandpiper, Aleutian                    | 87%                     | 10,001 to 100,000                  | Endemic                    | Yearround                | Subspecies                     | No                |
| Gray-tailed Tattler                         | 86%                     | 1,001 to 10,000                    | Unknown                    | Transient                | Species                        | Yes               |
| Sei whale, North Pacific                    | 86%                     | > 400,000                          | Unknown                    | Transient                | Species                        | No                |
| Arctic ground squirrel, St. Lawrence Island | 84%                     | 1,001 to 10,000                    | Endemic                    | Yearround                | Subspecies                     | No                |
| Sanderling                                  | 84%                     | 10,001 to 100,000                  | < 25%                      | Yearround                | Species                        | Yes               |
| Brown lemming, Nunivak Island               | 84%                     | 1,001 to 10,000                    | Endemic                    | Yearround                | Subspecies                     | No                |
| Alaskan hare, podromus                      | 84%                     | 100,001 to 400,000                 | Endemic                    | Yearround                | Subspecies                     | Yes               |
| Ermine, Suemez Island                       | 84%                     | 101 to 1,000                       | Endemic                    | Yearround                | Subspecies                     | No                |

Table 9, continued.

| <b>Common name</b>                             | <b>Biological score</b> | <b>Range size (km<sup>2</sup>)</b> | <b>% Global population</b> | <b>Alaska occurrence</b> | <b>Systematic significance</b> | <b>Peripheral</b> |
|--|-------------------------|------------------------------------|----------------------------|--------------------------|--------------------------------|-------------------|
| Collared lemming, peninsulae                   | 81%                     | 10,001 to 100,000                  | Endemic                    | Yearround                | Subspecies                     | No                |
| Common Tern                                    | 81%                     | 1,001 to 10,000                    | < 25%                      | Transient                | Species                        | Yes               |
| Columbia spotted frog                          | 80%                     | 1,001 to 10,000                    | < 25%                      | Yearround                | Species                        | Yes               |
| Marten, Kenai                                  | 80%                     | 10,001 to 100,000                  | Endemic                    | Yearround                | Subspecies                     | Yes               |
| Insular vole, St. Mathew Island                | 78%                     | 101 to 1,000                       | Endemic                    | Yearround                | Subspecies                     | No                |
| Dovekie  | 78%                     | 1,001 to 10,000                    | < 25%                      | Yearround                | Genus                          | Yes               |
| Ermine, Baranof                                | 77%                     | 1,001 to 10,000                    | Endemic                    | Yearround                | Subspecies                     | No                |
| Arctic ground squirrel, Shumagin Islands       | 76%                     | 101 to 1,000                       | Endemic                    | Yearround                | Subspecies                     | No                |
| Marbled Murrelet                               | 76%                     | 100,001 to 400,000                 | 75 to 89%                  | Yearround                | Species                        | No                |
| Rock Sandpiper, Bering Sea                     | 74%                     | 100,001 to 400,000                 | 75 to 89%                  | Yearround                | Subspecies                     | No                |
| Merlin, Black                                  | 74%                     | 10,001 to 100,000                  | 50 to 74%                  | Yearround                | Subspecies                     | No                |
| Ring-billed Gull                               | 73%                     | Unknown                            | < 25%                      | Yearround                | Species                        | Yes               |
| Southern red-backed vole, Revillagigedo Island | 71%                     | 1,001 to 10,000                    | Endemic                    | Yearround                | Subspecies                     | No                |
| Southern red-backed vole, Wrangell Island      | 71%                     | 1,001 to 10,000                    | Endemic                    | Yearround                | Subspecies                     | No                |
| Ivory Gull                                     | 71%                     | 10,001 to 100,000                  | < 25%                      | Nonbreeding              | Genus                          | Yes               |
| Stejneger's beaked whale, Alaska               | 71%                     | > 400,000                          | 25 to 49%                  | Yearround                | Species                        | No                |
| Northern red-backed vole, St. Lawrence Island  | 71%                     | 1,001 to 10,000                    | Endemic                    | Yearround                | Subspecies                     | No                |
| Insular vole                                   | 69%                     | 101 to 1,000                       | Endemic                    | Yearround                | Species                        | No                |
| California Gull                                | 69%                     | 10,001 to 100,000                  | < 25%                      | Yearround                | Species                        | Yes               |
| Root vole, Unalaska                            | 67%                     | Unknown                            | Endemic                    | Yearround                | Subspecies                     | No                |
| Northern red-backed vole, Orca                 | 67%                     | Unknown                            | Endemic                    | Yearround                | Subspecies                     | No                |
| Killdeer                                       | 67%                     | 10,001 to 100,000                  | < 25%                      | Yearround                | Species                        | Yes               |
| Sky Lark                                       | 65%                     | 1,001 to 10,000                    | < 25%                      | Breeding                 | Genus                          | Yes               |
| Cuvier's beaked whale, Alaska                  | 63%                     | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Blue whale, North Pacific                      | 63%                     | > 400,000                          | < 25%                      | Transient                | Species                        | No                |

Table 9, continued.

| <b>Common name</b>                 | <b>Biological score</b> | <b>Range size (km<sup>2</sup>)</b> | <b>% Global population</b> | <b>Alaska occurrence</b> | <b>Systematic significance</b> | <b>Peripheral</b> |
|------------------------------------|-------------------------|------------------------------------|----------------------------|--------------------------|--------------------------------|-------------------|
| Lesser Sand-Plover                 | 62%                     | 10,001 to 100,000                  | < 25%                      | Breeding                 | Genus                          | Yes               |
| Eurasian Dotterel                  | 62%                     | 10,001 to 100,000                  | < 25%                      | Breeding                 | Species                        | Yes               |
| American Bittern                   | 61%                     | Unknown                            | < 25%                      | Breeding                 | Species                        | Yes               |
| Buller's Shearwater                | 59%                     | > 400,000                          | < 25%                      | Nonbreeding              | Species                        | Yes               |
| Band-tailed Pigeon                 | 59%                     | 10,001 to 100,000                  | < 25%                      | Breeding                 | Species                        | Yes               |
| Winter Wren, Kodiak                | 59%                     | 10,001 to 100,000                  | Endemic                    | Yearround                | Subspecies                     | No                |
| Tennessee Warbler                  | 59%                     | 10,001 to 100,000                  | < 25%                      | Breeding                 | Species                        | Yes               |
| Eastern Kingbird                   | 58%                     | 10,001 to 100,000                  | < 25%                      | Transient                | Species                        | Yes               |
| Rustic Bunting                     | 56%                     | 1,001 to 10,000                    | < 25%                      | Transient                | Species                        | Yes               |
| Long-toed salamander               | 56%                     | 10,001 to 100,000                  | < 25%                      | Yearround                | Species                        | Yes               |
| Southern red-backed vole, Gapper's | 54%                     | 1,001 to 10,000                    | 50 to 74%                  | Yearround                | Subspecies                     | No                |
| St. Lawrence Island shrew          | 54%                     | 1,001 to 10,000                    | Endemic                    | Yearround                | Species                        | No                |
| Northwestern salamander            | 51%                     | 10,001 to 100,000                  | < 25%                      | Yearround                | Species                        | Yes               |
| Red-winged Blackbird               | 50%                     | 10,001 to 100,000                  | < 25%                      | Yearround                | Species                        | Yes               |
| Red-eyed Vireo                     | 47%                     | 101 to 1,000                       | < 25%                      | Breeding                 | Species                        | Yes               |
| Upland Sandpiper                   | 45%                     | 100,001 to 400,000                 | < 25%                      | Breeding                 | Genus                          | Yes               |
| Gray-headed Chickadee              | 45%                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | No                |
| Northern elephant seal             | 45%                     | 10,001 to 100,000                  | < 25%                      | Transient                | Species                        | No                |
| Sora                               | 44%                     | 10,001 to 100,000                  | < 25%                      | Breeding                 | Species                        | Yes               |
| American Crow                      | 42%                     | 101 to 1,000                       | < 25%                      | Breeding                 | Species                        | Yes               |
| Yellow-bellied Sapsucker           | 42%                     | 10,001 to 100,000                  | < 25%                      | Breeding                 | Species                        | Yes               |
| Swainson's Hawk                    | 40%                     | 100,001 to 400,000                 | < 25%                      | Breeding                 | Species                        | Yes               |
| Ross's Gull                        | 40%                     | 100,001 to 400,000                 | 75 to 89%                  | Transient                | Genus                          | Yes               |
| White-rumped Sandpiper             | 40%                     | 10,001 to 100,000                  | < 25%                      | Breeding                 | Species                        | Yes               |
| Barred Owl                         | 38%                     | 10,001 to 100,000                  | < 25%                      | Yearround                | Species                        | Yes               |
| Brown-headed Cowbird               | 36%                     | 10,001 to 100,000                  | < 25%                      | Breeding                 | Species                        | Yes               |
| Tundra shrew                       | 34%                     | > 400,000                          | 75 to 89%                  | Yearround                | Species                        | No                |

Table 9, continued.

| <b>Common name</b>              | <b>Biological score</b> | <b>Range size (km<sup>2</sup>)</b> | <b>% Global population</b> | <b>Alaska occurrence</b> | <b>Systematic significance</b> | <b>Peripheral</b> |
|---------------------------------|-------------------------|------------------------------------|----------------------------|--------------------------|--------------------------------|-------------------|
| Stilt Sandpiper                 | 34%                     | 10,001 to 100,000                  | < 25%                      | Breeding                 | Species                        | No                |
| Barn Swallow                    | 34%                     | 100,001 to 400,000                 | < 25%                      | Breeding                 | Species                        | Yes               |
| Southern red-backed vole, pheas | 33%                     | 1,001 to 10,000                    | < 25%                      | Yearround                | Subspecies                     | No                |
| Pied-billed Grebe               | 33%                     | Unknown                            | < 25%                      | Yearround                | Species                        | Yes               |
| North American deermouse        | 30%                     | 10,001 to 100,000                  | < 25%                      | Yearround                | Species                        | No                |
| White Wagtail                   | 27%                     | 10,001 to 100,000                  | < 25%                      | Breeding                 | Species                        | Yes               |
| Northern Rough-winged Swallow   | 24%                     | 101 to 1,000                       | < 25%                      | Breeding                 | Species                        | Yes               |
| Anna's Hummingbird              | 23%                     | 10,001 to 100,000                  | < 25%                      | Yearround                | Species                        | Yes               |
| Hoary Redpoll                   | 20%                     | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Goshawk, Northern               | 19%                     | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Western Tanager                 | 14%                     | 10,001 to 100,000                  | < 25%                      | Breeding                 | Species                        | Yes               |
| Northern Shrike                 | 14%                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | Yes               |
| Mountain Bluebird               | 14%                     | 100,001 to 400,000                 | < 25%                      | Breeding                 | Species                        | Yes               |
| Bluethroat                      | 10%                     | 100,001 to 400,000                 | < 25%                      | Breeding                 | Species                        | Yes               |
| Townsend's Solitaire            | 10%                     | 100,001 to 400,000                 | < 25%                      | Breeding                 | Species                        | Yes               |
| Sharp-tailed Sandpiper          | 5%                      | 10,001 to 100,000                  | < 25%                      | Transient                | Species                        | Yes               |
| MacGillivray's Warbler          | 3%                      | 10,001 to 100,000                  | < 25%                      | Breeding                 | Species                        | Yes               |

Table 10. Taxa in need of increased monitoring efforts in Alaska. Distribution of these taxa are reasonably known (survey score < 10), but the taxa listed are not monitored or are only monitored locally (monitoring score  $\geq 2$ ). Taxa are listed in order of decreasing biological scores with biological scores expressed as a percentage of taxa that rank below them. Range scores were included to demonstrate the spatial extent that requires consideration if statewide monitoring efforts are to be implemented and percent global population scores were included to illustrate the global responsibility that Alaska has for each taxa. Alaska occurrence, systematic significance, and peripheral are supplemental variables.

| Common name                                      | Biological score | Survey efforts | Monitoring efforts | Range size (km <sup>2</sup> ) | % Global population | Alaska occurrence | Systematic significance | Peripheral |
|--|------------------|----------------|--------------------|-------------------------------|---------------------|-------------------|-------------------------|------------|
| Brandt's Cormorant                               | 99%              | Substantial    | Local              | < 100                         | < 25%               | Yearround         | Species                 | Yes        |
| White-fronted Goose, Tule                        | 98%              | Moderate       | Local              | 1,001 to 10,000               | > 90%               | Breeding          | Subspecies              | No         |
| North Pacific right whale, Eastern North Pacific | 98%              | Moderate       | Local              | > 400,000                     | Unknown             | Yearround         | Species                 | No         |
| Polar bear                                       | 98%              | Substantial    | Local              | 10,001 to 100,000             | < 25%               | Yearround         | Species                 | No         |
| Rock Ptarmigan, Evermann's                       | 98%              | Substantial    | None               | 1,001 to 10,000               | Endemic             | Yearround         | Subspecies              | No         |
| Hoary marmot, Montague Island                    | 97%              | Moderate       | None               | 101 to 1,000                  | Endemic             | Yearround         | Subspecies              | No         |
| Rock Ptarmigan, Turner's                         | 97%              | Moderate       | None               | 1,001 to 10,000               | Endemic             | Yearround         | Subspecies              | No         |
| Northern flying squirrel, Prince of Wales        | 96%              | Substantial    | None               | 10,001 to 100,000             | Endemic             | Yearround         | Subspecies              | No         |
| Rock Ptarmigan, Townsend's                       | 96%              | Moderate       | None               | 101 to 1,000                  | Endemic             | Yearround         | Subspecies              | No         |
| Brown lemming, black-footed                      | 95%              | Moderate       | None               | < 100                         | Endemic             | Yearround         | Subspecies              | No         |
| Spruce Grouse, Prince of Wales                   | 94%              | Moderate       | None               | 1,001 to 10,000               | Endemic             | Yearround         | Population              | No         |
| McKay's Bunting                                  | 92%              | Substantial    | None               | 101 to 1,000                  | Endemic             | Yearround         | Species                 | No         |
| Song Sparrow, Aleutian                           | 92%              | Moderate       | None               | 1,001 to 10,000               | Endemic             | Yearround         | Subspecies              | No         |
| Winter Wren, Semidi                              | 92%              | Moderate       | None               | < 100                         | Endemic             | Yearround         | Subspecies              | No         |
| Root vole, Montague Island                       | 91%              | Substantial    | None               | 101 to 1,000                  | Endemic             | Yearround         | Subspecies              | No         |
| Winter Wren, Pribilof                            | 91%              | Moderate       | None               | 101 to 1,000                  | Endemic             | Yearround         | Subspecies              | No         |
| California myotis                                | 90%              | Moderate       | None               | 1,001 to 10,000               | < 25%               | Yearround         | Species                 | Yes        |
| River otter, Prince of Wales                     | 89%              | Moderate       | None               | 10,001 to 100,000             | Endemic             | Yearround         | Subspecies              | No         |
| Common Greenshank                                | 89%              | Moderate       | None               | 1,001 to 10,000               | < 25%               | Transient         | Species                 | No         |
| Root vole, Punuk Island                          | 88%              | Moderate       | None               | < 100                         | Endemic             | Yearround         | Subspecies              | No         |
| Long-tailed vole, Coronation Island              | 87%              | Moderate       | None               | 101 to 1,000                  | Endemic             | Yearround         | Subspecies              | No         |
| Dusky shrew, Warren Island                       | 87%              | Moderate       | None               | 101 to 1,000                  | Endemic             | Yearround         | Subspecies              | No         |
| Northwestern deer mouse, sitkensis               | 86%              | Moderate       | None               | 1,001 to 10,000               | Endemic             | Yearround         | Subspecies              | No         |
| Black Guillemot                                  | 84%              | Moderate       | Local              | 10,001 to 100,000             | < 25%               | Yearround         | Species                 | Yes        |
| Western Sandpiper                                | 84%              | Substantial    | None               | 100,001 to 400,000            | > 90%               | Breeding          | Species                 | No         |



Table 10, continued.

| <b>Common name</b>                    | <b>Biological score</b> | <b>Survey efforts</b> | <b>Monitoring efforts</b> | <b>Range size (km<sup>2</sup>)</b> | <b>% Global population</b> | <b>Alaska occurrence</b> | <b>Systematic significance</b> | <b>Peripheral</b> |
|---------------------------------------|-------------------------|-----------------------|---------------------------|------------------------------------|----------------------------|--------------------------|--------------------------------|-------------------|
| Northwestern deermouse, oceanicus     | 81%                     | Moderate              | None                      | < 100                              | Endemic                    | Yearround                | Subspecies                     | No                |
| Root vole, Sitka                      | 81%                     | Moderate              | None                      | 1,001 to 10,000                    | Endemic                    | Yearround                | Subspecies                     | No                |
| Root vole, St. Lawrence Island        | 81%                     | Moderate              | None                      | 1,001 to 10,000                    | Endemic                    | Yearround                | Subspecies                     | No                |
| Northern red-backed vole, Island      | 81%                     | Moderate              | None                      | < 100                              | Endemic                    | Yearround                | Subspecies                     | No                |
| Marbled Godwit                        | 81%                     | Substantial           | None                      | 1,001 to 10,000                    | < 25%                      | Breeding                 | Species                        | No                |
| Alaskan hare, othus                   | 81%                     | Substantial           | None                      | 100,001 to 400,000                 | Endemic                    | Yearround                | Subspecies                     | No                |
| Goshawk, Queen Charlotte              | 80%                     | Substantial           | Local                     | 10,001 to 100,000                  | 25 to 49%                  | Yearround                | Subspecies                     | No                |
| Root vole, Yakutat                    | 78%                     | Moderate              | None                      | 101 to 1,000                       | Endemic                    | Yearround                | Subspecies                     | No                |
| Arctic Loon                           | 78%                     | Moderate              | None                      | 10,001 to 100,000                  | < 25%                      | Breeding                 | Species                        | Yes               |
| Northern red-backed vole, Glacier Bay | 78%                     | Moderate              | None                      | 101 to 1,000                       | Endemic                    | Yearround                | Subspecies                     | No                |
| Red squirrel, Kenai                   | 78%                     | Moderate              | None                      | 10,001 to 100,000                  | Endemic                    | Yearround                | Subspecies                     | No                |
| Surfbird                              | 78%                     | Moderate              | Local                     | 100,001 to 400,000                 | 75 to 89%                  | Yearround                | Genus                          | No                |
| Ermine, Prince of Wales               | 77%                     | Moderate              | Local                     | 1,001 to 10,000                    | Endemic                    | Yearround                | Subspecies                     | No                |
| Walrus                                | 77%                     | Substantial           | Local                     | > 400,000                          | 75 to 89%                  | Yearround                | Family                         | No                |
| Alaskan hare                          | 76%                     | Moderate              | None                      | 100,001 to 400,000                 | Endemic                    | Yearround                | Species                        | No                |
| Wolf, Alexander Archipelago           | 76%                     | Moderate              | None                      | 101 to 1,000                       | Endemic                    | Yearround                | Population                     | No                |
| Long-legged myotis                    | 75%                     | Moderate              | None                      | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | Yes               |
| Peregrine Falcon, Peale's             | 74%                     | Moderate              | Local                     | 100,001 to 400,000                 | > 90%                      | Yearround                | Subspecies                     | No                |
| Bristle-thighed Curlew                | 74%                     | Substantial           | Local                     | 10,001 to 100,000                  | > 90%                      | Breeding                 | Species                        | No                |
| Root vole, Amak Island                | 74%                     | Substantial           | None                      | < 100                              | Endemic                    | Yearround                | Subspecies                     | No                |
| Marten, Pacific                       | 74%                     | Moderate              | None                      | 1,001 to 10,000                    | 25 to 49%                  | Yearround                | Subspecies                     | Yes               |
| Dusky shrew, Yakutat                  | 71%                     | Moderate              | None                      | 10,001 to 100,000                  | Endemic                    | Yearround                | Subspecies                     | No                |
| Baird's beaked whale, Alaska          | 71%                     | Moderate              | Local                     | > 400,000                          | Unknown                    | Transient                | Species                        | No                |
| Pribilof Island shrew                 | 71%                     | Substantial           | None                      | < 100                              | Endemic                    | Yearround                | Species                        | No                |
| Winter Wren, Kiska                    | 71%                     | Moderate              | None                      | 10,001 to 100,000                  | Endemic                    | Yearround                | Subspecies                     | No                |
| Great Blue Heron, Pacific             | 70%                     | Moderate              | Local                     | 10,001 to 100,000                  | > 90%                      | Yearround                | Subspecies                     | No                |
| Black Swift                           | 69%                     | Moderate              | None                      | 10,001 to 100,000                  | < 25%                      | Yearround                | Genus                          | Yes               |
| Ruff                                  | 69%                     | Moderate              | None                      | 1,001 to 10,000                    | < 25%                      | Transient                | Genus                          | Yes               |
| Red Knot                              | 69%                     | Moderate              | Local                     | 10,001 to 100,000                  | < 25%                      | Breeding                 | Species                        | Yes               |
| Winter Wren, Attu                     | 69%                     | Moderate              | None                      | 1,001 to 10,000                    | Endemic                    | Yearround                | Subspecies                     | No                |
| Western Screech-Owl                   | 68%                     | Moderate              | Local                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | Yes               |

Table 10, continued.

| <b>Common name</b>                   | <b>Biological score</b> | <b>Survey efforts</b> | <b>Monitoring efforts</b> | <b>Range size (km<sup>2</sup>)</b> | <b>% Global population</b> | <b>Alaska occurrence</b> | <b>Systematic significance</b> | <b>Peripheral</b> |
|--------------------------------------|-------------------------|-----------------------|---------------------------|------------------------------------|----------------------------|--------------------------|--------------------------------|-------------------|
| Brambling                            | 67%                     | Moderate              | None                      | 1,001 to 10,000                    | < 25%                      | Breeding                 | Species                        | Yes               |
| Killer whale                         | 67%                     | Substantial           | Local                     | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Eye-browed Thrush                    | 65%                     | Moderate              | None                      | 1,001 to 10,000                    | < 25%                      | Transient                | Species                        | Yes               |
| Long-toed Stint                      | 65%                     | Moderate              | None                      | 1,001 to 10,000                    | < 25%                      | Transient                | Species                        | Yes               |
| Ribbon seal                          | 65%                     | Moderate              | Local                     | 100,001 to 400,000                 | 50 to 74%                  | Yearround                | Genus                          | No                |
| Black Oystercatcher                  | 65%                     | Substantial           | Local                     | 10,001 to 100,000                  | 50 to 74%                  | Yearround                | Species                        | No                |
| Meadow vole, Admiralty               | 63%                     | Moderate              | None                      | 101 to 1,000                       | Endemic                    | Yearround                | Subspecies                     | No                |
| Common Sandpiper                     | 63%                     | Moderate              | None                      | 1,001 to 10,000                    | < 25%                      | Transient                | Species                        | Yes               |
| Siberian Rubythroat                  | 63%                     | Moderate              | None                      | 1,001 to 10,000                    | < 25%                      | Transient                | Species                        | Yes               |
| Northwestern deermouse, hylaeus      | 63%                     | Moderate              | None                      | 10,001 to 100,000                  | Endemic                    | Yearround                | Subspecies                     | No                |
| Bar-tailed Godwit                    | 63%                     | Substantial           | Local                     | 1,001 to 10,000                    | < 25%                      | Breeding                 | Species                        | Yes               |
| Black Scoter                         | 63%                     | Substantial           | Local                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | Yes               |
| Caspian Tern                         | 63%                     | Substantial           | None                      | 1,001 to 10,000                    | < 25%                      | Breeding                 | Species                        | Yes               |
| Pink-footed Shearwater               | 62%                     | Substantial           | None                      | > 400,000                          | < 25%                      | Nonbreeding              | Species                        | No                |
| Fin whale, Northeast Pacific         | 61%                     | Moderate              | Local                     | > 400,000                          | < 25%                      | Transient                | Species                        | No                |
| Alaska tiny shrew                    | 59%                     | Moderate              | None                      | 100,001 to 400,000                 | Endemic                    | Yearround                | Species                        | No                |
| Dunlin, Pacific                      | 59%                     | Moderate              | None                      | 100,001 to 400,000                 | > 90%                      | Yearround                | Subspecies                     | No                |
| Dunlin, Arctic                       | 59%                     | Substantial           | Local                     | 100,001 to 400,000                 | > 90%                      | Yearround                | Subspecies                     | No                |
| Sperm whale, North Pacific           | 59%                     | Substantial           | None                      | > 400,000                          | < 25%                      | Transient                | Species                        | No                |
| Fork-tailed Storm-Petrel, furcata    | 59%                     | Substantial           | Local                     | > 400,000                          | > 90%                      | Yearround                | Subspecies                     | No                |
| Silver-haired bat                    | 56%                     | Moderate              | None                      | 10,001 to 100,000                  | < 25%                      | Yearround                | Species                        | Yes               |
| Northern flying squirrel             | 56%                     | Moderate              | None                      | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Northern Harrier                     | 56%                     | Moderate              | Local                     | 10,001 to 100,000                  | < 25%                      | Yearround                | Genus                          | No                |
| Hudsonian Godwit                     | 56%                     | Moderate              | None                      | 10,001 to 100,000                  | < 25%                      | Breeding                 | Species                        | No                |
| Surf Scoter                          | 56%                     | Moderate              | Local                     | 10,001 to 100,000                  | Unknown                    | Yearround                | Species                        | No                |
| Horned Grebe                         | 56%                     | Substantial           | Local                     | 100,001 to 400,000                 | Unknown                    | Yearround                | Species                        | No                |
| Black-headed Gull                    | 54%                     | Moderate              | None                      | 10,001 to 100,000                  | < 25%                      | Transient                | Species                        | Yes               |
| Dusky shrew, Queen Charlotte Islands | 54%                     | Substantial           | None                      | 10,001 to 100,000                  | 50 to 74%                  | Yearround                | Subspecies                     | No                |
| Laysan Albatross                     | 54%                     | Substantial           | None                      | > 400,000                          | < 25%                      | Nonbreeding              | Species                        | No                |
| Least Auklet                         | 54%                     | Substantial           | Local                     | 10,001 to 100,000                  | 50 to 74%                  | Yearround                | Species                        | No                |
| Alaska marmot                        | 52%                     | Moderate              | None                      | 100,001 to 400,000                 | Endemic                    | Yearround                | Species                        | No                |

Table 10, continued.

| <b>Common name</b>                  | <b>Biological score</b> | <b>Survey efforts</b> | <b>Monitoring efforts</b> | <b>Range size (km<sup>2</sup>)</b> | <b>% Global population</b> | <b>Alaska occurrence</b> | <b>Systematic significance</b> | <b>Peripheral</b> |
|-------------------------------------|-------------------------|-----------------------|---------------------------|------------------------------------|----------------------------|--------------------------|--------------------------------|-------------------|
| Long-tailed vole, littoralis        | 52%                     | Substantial           | None                      | 10,001 to 100,000                  | 50 to 74%                  | Yearround                | Subspecies                     | No                |
| Red-faced Cormorant                 | 52%                     | Substantial           | Local                     | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Black-footed Albatross              | 52%                     | Substantial           | None                      | > 400,000                          | < 25%                      | Nonbreeding              | Species                        | No                |
| Spotted seal                        | 51%                     | Substantial           | None                      | > 400,000                          | 25 to 49%                  | Yearround                | Species                        | No                |
| Whiskered Auklet                    | 51%                     | Substantial           | Local                     | 10,001 to 100,000                  | 75 to 89%                  | Yearround                | Species                        | No                |
| Northern Pygmy-owl                  | 50%                     | Moderate              | Local                     | 10,001 to 100,000                  | < 25%                      | Yearround                | Species                        | Yes               |
| Northern Saw-whet Owl               | 50%                     | Moderate              | Local                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | Yes               |
| Ermine, Kodiak Island               | 50%                     | Moderate              | Local                     | 10,001 to 100,000                  | Endemic                    | Yearround                | Subspecies                     | No                |
| Bald Eagle                          | 50%                     | Substantial           | Local                     | 100,001 to 400,000                 | 50 to 74%                  | Yearround                | Species                        | No                |
| Northwestern deermouse, macrorhinus | 49%                     | Moderate              | None                      | 10,001 to 100,000                  | Unknown                    | Yearround                | Subspecies                     | No                |
| Northwestern deermouse, algidus     | 49%                     | Moderate              | None                      | 1,001 to 10,000                    | 50 to 74%                  | Yearround                | Subspecies                     | No                |
| Red squirrel, Kupreanof             | 49%                     | Substantial           | None                      | 10,001 to 100,000                  | 50 to 74%                  | Yearround                | Subspecies                     | No                |
| Crested Auklet                      | 49%                     | Substantial           | Local                     | 10,001 to 100,000                  | 50 to 74%                  | Yearround                | Species                        | No                |
| Little brown myotis                 | 48%                     | Substantial           | None                      | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Black-backed Woodpecker             | 47%                     | Moderate              | None                      | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Aleutian Tern                       | 47%                     | Substantial           | Local                     | > 400,000                          | 25 to 49%                  | Breeding                 | Species                        | No                |
| Canadian lynx                       | 47%                     | Moderate              | Local                     | > 400,000                          | 25 to 49%                  | Yearround                | Species                        | No                |
| Northern Flicker                    | 45%                     | Moderate              | Local                     | > 400,000                          | < 25%                      | Breeding                 | Species                        | No                |
| Long-tailed Duck                    | 45%                     | Substantial           | Local                     | 100,001 to 400,000                 | 25 to 49%                  | Yearround                | Genus                          | No                |
| Arctic Tern                         | 45%                     | Moderate              | Local                     | > 400,000                          | > 90%                      | Breeding                 | Species                        | No                |
| Short-tailed Albatross              | 45%                     | Substantial           | None                      | > 400,000                          | < 25%                      | Nonbreeding              | Species                        | No                |
| Vaux's Swift                        | 44%                     | Moderate              | None                      | 10,001 to 100,000                  | < 25%                      | Breeding                 | Species                        | Yes               |
| Roughskin newt                      | 44%                     | Substantial           | None                      | 10,001 to 100,000                  | < 25%                      | Yearround                | Species                        | Yes               |
| Black-legged Kittiwake              | 44%                     | Substantial           | Local                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | No                |
| Collared pika                       | 42%                     | Moderate              | None                      | > 400,000                          | 25 to 49%                  | Yearround                | Species                        | No                |
| Red Crossbill                       | 42%                     | Moderate              | Local                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | Yes               |
| Three-toed Woodpecker               | 42%                     | Substantial           | Local                     | > 400,000                          | 25 to 49%                  | Yearround                | Species                        | No                |
| Wandering Tattler                   | 41%                     | Moderate              | None                      | > 400,000                          | 50 to 74%                  | Breeding                 | Species                        | No                |
| Common minke whale, Alaska          | 41%                     | Moderate              | Local                     | > 400,000                          | < 25%                      | Transient                | Species                        | No                |
| Arctic ground squirrel, Aleutian    | 40%                     | Moderate              | None                      | 100,001 to 400,000                 | Endemic                    | Yearround                | Subspecies                     | No                |
| Red-necked Grebe                    | 40%                     | Substantial           | Local                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | No                |

Table 10, continued.

| <b>Common name</b>                | <b>Biological score</b> | <b>Survey efforts</b> | <b>Monitoring efforts</b> | <b>Range size (km<sup>2</sup>)</b> | <b>% Global population</b> | <b>Alaska occurrence</b> | <b>Systematic significance</b> | <b>Peripheral</b> |
|-----------------------------------|-------------------------|-----------------------|---------------------------|------------------------------------|----------------------------|--------------------------|--------------------------------|-------------------|
| Golden-crowned Sparrow            | 38%                     | Moderate              | None                      | > 400,000                          | 75 to 89%                  | Breeding                 | Species                        | No                |
| Smith's Longspur                  | 38%                     | Moderate              | None                      | 100,001 to 400,000                 | < 25%                      | Breeding                 | Species                        | No                |
| Great Gray Owl                    | 38%                     | Moderate              | Local                     | > 400,000                          | < 25%                      | Yearround                | Genus                          | No                |
| Peregrine Falcon, American        | 38%                     | Moderate              | Local                     | > 400,000                          | 25 to 49%                  | Breeding                 | Subspecies                     | No                |
| Golden Eagle                      | 38%                     | Substantial           | Local                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | No                |
| Ancient Murrelet                  | 38%                     | Substantial           | Local                     | > 400,000                          | < 25%                      | Breeding                 | Species                        | No                |
| Bearded seal                      | 37%                     | Moderate              | None                      | 100,001 to 400,000                 | 50 to 74%                  | Yearround                | Species                        | No                |
| Northern Hawk-owl                 | 37%                     | Moderate              | Local                     | > 400,000                          | 25 to 49%                  | Yearround                | Genus                          | No                |
| Pigeon Guillemot                  | 37%                     | Moderate              | Local                     | > 400,000                          | 50 to 74%                  | Yearround                | Species                        | No                |
| Lesser Yellowlegs                 | 34%                     | Moderate              | Local                     | > 400,000                          | 25 to 49%                  | Breeding                 | Species                        | No                |
| Gyr Falcon                        | 34%                     | Moderate              | Local                     | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Fork-tailed Storm-Petrel, plumbea | 34%                     | Moderate              | None                      | 100,001 to 400,000                 | < 25%                      | Yearround                | Subspecies                     | No                |
| Rusty Blackbird                   | 34%                     | Substantial           | Local                     | > 400,000                          | 25 to 49%                  | Breeding                 | Species                        | No                |
| Chestnut-backed Chickadee         | 34%                     | Substantial           | Local                     | 100,001 to 400,000                 | 25 to 49%                  | Yearround                | Species                        | No                |
| Common Eider, Pacific             | 34%                     | Substantial           | Local                     | 100,001 to 400,000                 | 25 to 49%                  | Yearround                | Subspecies                     | No                |
| Gray-crowned Rosy-finch           | 33%                     | Moderate              | None                      | 10,001 to 100,000                  | < 25%                      | Yearround                | Species                        | No                |
| Common Loon                       | 33%                     | Substantial           | None                      | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | No                |
| Rufous Hummingbird                | 32%                     | Substantial           | Local                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | No                |
| Southern red-backed vole          | 30%                     | Moderate              | None                      | 1,001 to 10,000                    | < 25%                      | Yearround                | Species                        | Yes               |
| Brown lemming                     | 30%                     | Moderate              | None                      | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| American Redstart                 | 30%                     | Moderate              | Local                     | 10,001 to 100,000                  | < 25%                      | Breeding                 | Genus                          | Yes               |
| Belted Kingfisher                 | 30%                     | Moderate              | Local                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | No                |
| Snowy Owl                         | 30%                     | Moderate              | Local                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | No                |
| Blackpoll Warbler                 | 30%                     | Substantial           | Local                     | > 400,000                          | 25 to 49%                  | Breeding                 | Species                        | No                |
| Ringed seal                       | 30%                     | Substantial           | Local                     | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Short-billed Dowitcher            | 29%                     | Moderate              | None                      | 100,001 to 400,000                 | 25 to 49%                  | Breeding                 | Species                        | No                |
| Rough-legged Hawk                 | 29%                     | Moderate              | None                      | > 400,000                          | < 25%                      | Breeding                 | Species                        | No                |
| Western toad                      | 29%                     | Substantial           | Local                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | Yes               |
| Collared lemming                  | 27%                     | Moderate              | None                      | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| White-winged Scoter               | 27%                     | Moderate              | Local                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | No                |
| Red-breasted Nuthatch             | 27%                     | Moderate              | Local                     | 100,001 to 400,000                 | Unknown                    | Yearround                | Species                        | Yes               |

Table 10, continued.

| <b>Common name</b>                                | <b>Biological score</b> | <b>Survey efforts</b> | <b>Monitoring efforts</b> | <b>Range size (km<sup>2</sup>)</b> | <b>% Global population</b> | <b>Alaska occurrence</b> | <b>Systematic significance</b> | <b>Peripheral</b> |
|---|-------------------------|-----------------------|---------------------------|------------------------------------|----------------------------|--------------------------|--------------------------------|-------------------|
| Double-crested Cormorant                          | 27%                     | Substantial           | Local                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | No                |
| Yellow-billed Loon                                | 27%                     | Substantial           | Local                     | 100,001 to 400,000                 | 50 to 74%                  | Yearround                | Species                        | No                |
| Peregrine Falcon, Arctic                          | 27%                     | Substantial           | Local                     | > 400,000                          | < 25%                      | Breeding                 | Subspecies                     | No                |
| Osprey  | 26%                     | Moderate              | Local                     | > 400,000                          | < 25%                      | Breeding                 | Genus                          | No                |
| Leach's Storm-petrel                              | 26%                     | Moderate              | Local                     | > 400,000                          | 50 to 74%                  | Yearround                | Species                        | No                |
| Boreal Owl  | 24%                     | Moderate              | Local                     | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Wilson's Warbler                                  | 24%                     | Moderate              | Local                     | > 400,000                          | 25 to 49%                  | Breeding                 | Species                        | No                |
| Buff-breasted Sandpiper                           | 24%                     | Substantial           | None                      | 100,001 to 400,000                 | 25 to 49%                  | Breeding                 | Species                        | No                |
| Gray-cheeked Thrush                               | 24%                     | Substantial           | Local                     | > 400,000                          | 25 to 49%                  | Breeding                 | Species                        | No                |
| Brown Creeper                                     | 24%                     | Substantial           | Local                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | Yes               |
| Western Wood-pewee                                | 23%                     | Substantial           | Local                     | 100,001 to 400,000                 | < 25%                      | Breeding                 | Species                        | Yes               |
| Pygmy shrew                                       | 20%                     | Moderate              | None                      | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Solitary Sandpiper                                | 20%                     | Moderate              | Local                     | > 400,000                          | < 25%                      | Breeding                 | Species                        | No                |
| Taiga vole (yellow-cheeked vole)                  | 20%                     | Substantial           | Local                     | 10,001 to 100,000                  | < 25%                      | Yearround                | Species                        | No                |
| Great Horned Owl                                  | 20%                     | Moderate              | Local                     | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Red-tailed Hawk                                   | 20%                     | Moderate              | Local                     | > 400,000                          | < 25%                      | Breeding                 | Species                        | No                |
| Semipalmated Sandpiper                            | 20%                     | Substantial           | None                      | 100,001 to 400,000                 | < 25%                      | Breeding                 | Species                        | No                |
| Pacific-slope Flycatcher                          | 20%                     | Moderate              | Local                     | 10,001 to 100,000                  | < 25%                      | Breeding                 | Species                        | No                |
| Varied Thrush                                     | 20%                     | Substantial           | Local                     | 10,001 to 100,000                  | 50 to 74%                  | Yearround                | Genus                          | No                |
| Golden-crowned Kinglet                            | 20%                     | Substantial           | Local                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | Yes               |
| Humpback whale, Central and Western North Pacific | 20%                     | Substantial           | Local                     | > 400,000                          | < 25%                      | Transient                | Species                        | No                |
| Northern bog lemming                              | 19%                     | Substantial           | None                      | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Harbor porpoise                                   | 19%                     | Moderate              | Local                     | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Water shrew                                       | 18%                     | Moderate              | None                      | 10,001 to 100,000                  | < 25%                      | Yearround                | Species                        | Yes               |
| Meadow jumping mouse                              | 14%                     | Substantial           | None                      | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Short-eared Owl                                   | 14%                     | Moderate              | Local                     | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Arctic Warbler                                    | 14%                     | Substantial           | None                      | > 400,000                          | < 25%                      | Breeding                 | Species                        | Yes               |
| American Tree Sparrow                             | 14%                     | Substantial           | None                      | > 400,000                          | < 25%                      | Breeding                 | Species                        | No                |
| Northwestern deermouse                            | 14%                     | Substantial           | None                      | 100,001 to 400,000                 | 25 to 49%                  | Yearround                | Species                        | No                |
| Townsend's Warbler                                | 14%                     | Moderate              | Local                     | 100,001 to 400,000                 | 25 to 49%                  | Breeding                 | Species                        | Yes               |

Table 10, continued.

| <b>Common name</b>             | <b>Biological score</b> | <b>Survey efforts</b> | <b>Monitoring efforts</b> | <b>Range size (km<sup>2</sup>)</b> | <b>% Global population</b> | <b>Alaska occurrence</b> | <b>Systematic significance</b> | <b>Peripheral</b> |
|--------------------------------|-------------------------|-----------------------|---------------------------|------------------------------------|----------------------------|--------------------------|--------------------------------|-------------------|
| Olive-sided Flycatcher         | 14%                     | Moderate              | Local                     | > 400,000                          | < 25%                      | Breeding                 | Species                        | No                |
| Merlin                         | 14%                     | Moderate              | Local                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | No                |
| American Dipper                | 14%                     | Moderate              | Local                     | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Pacific Loon                   | 14%                     | Substantial           | Local                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | No                |
| White-winged Crossbill         | 14%                     | Substantial           | Local                     | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Fox Sparrow                    | 13%                     | Moderate              | Local                     | > 400,000                          | 25 to 49%                  | Yearround                | Genus                          | No                |
| Boreal Chickadee               | 13%                     | Moderate              | Local                     | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Northern Waterthrush           | 13%                     | Substantial           | Local                     | > 400,000                          | 25 to 49%                  | Breeding                 | Species                        | No                |
| Peregrine Falcon               | 13%                     | Substantial           | Local                     | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Arctic ground squirrel         | 12%                     | Substantial           | Local                     | > 400,000                          | 50 to 74%                  | Yearround                | Species                        | No                |
| Baird's Sandpiper              | 10%                     | Moderate              | None                      | > 400,000                          | < 25%                      | Breeding                 | Species                        | No                |
| Arctic ground squirrel, Barrow | 10%                     | Moderate              | Local                     | 100,001 to 400,000                 | 75 to 89%                  | Yearround                | Subspecies                     | No                |
| Whimbrel                       | 10%                     | Moderate              | None                      | 10,001 to 100,000                  | < 25%                      | Breeding                 | Species                        | No                |
| Red Phalarope                  | 10%                     | Substantial           | None                      | 100,001 to 400,000                 | < 25%                      | Breeding                 | Species                        | No                |
| Pine Siskin                    | 10%                     | Substantial           | Local                     | 10,001 to 100,000                  | < 25%                      | Yearround                | Species                        | No                |
| Bank Swallow                   | 10%                     | Substantial           | Local                     | > 400,000                          | < 25%                      | Breeding                 | Species                        | No                |
| Thick-billed Murre             | 10%                     | Substantial           | Local                     | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Sharp-shinned Hawk             | 9%                      | Moderate              | Local                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | No                |
| Long-tailed vole               | 8%                      | Substantial           | None                      | > 400,000                          | < 25%                      | Yearround                | Species                        | Yes               |
| Violet-green Swallow           | 8%                      | Moderate              | Local                     | > 400,000                          | < 25%                      | Breeding                 | Species                        | No                |
| Dusky shrew                    | 8%                      | Substantial           | None                      | > 400,000                          | 25 to 49%                  | Yearround                | Species                        | No                |
| American Golden-plover         | 8%                      | Substantial           | None                      | 100,001 to 400,000                 | 25 to 49%                  | Breeding                 | Species                        | No                |
| Red-necked Phalarope           | 8%                      | Substantial           | Local                     | > 400,000                          | < 25%                      | Breeding                 | Species                        | No                |
| Bohemian Waxwing               | 8%                      | Substantial           | None                      | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| White-crowned Sparrow          | 6%                      | Moderate              | Local                     | > 400,000                          | 25 to 49%                  | Yearround                | Species                        | No                |
| Glaucous Gull                  | 6%                      | Moderate              | Local                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | No                |
| Singing vole                   | 6%                      | Substantial           | Local                     | > 400,000                          | 50 to 74%                  | Yearround                | Species                        | No                |
| Eastern Yellow Wagtail         | 6%                      | Substantial           | None                      | 100,001 to 400,000                 | < 25%                      | Breeding                 | Species                        | No                |
| Pacific Golden-plover          | 6%                      | Substantial           | Local                     | > 400,000                          | < 25%                      | Breeding                 | Species                        | No                |
| Pelagic Cormorant              | 6%                      | Substantial           | Local                     | > 400,000                          | 25 to 49%                  | Yearround                | Species                        | No                |
| Common Murre                   | 6%                      | Substantial           | Local                     | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |

Table 10, continued.

| <b>Common name</b>       | <b>Biological score</b> | <b>Survey efforts</b> | <b>Monitoring efforts</b> | <b>Range size (km<sup>2</sup>)</b> | <b>% Global population</b> | <b>Alaska occurrence</b> | <b>Systematic significance</b> | <b>Peripheral</b> |
|--------------------------|-------------------------|-----------------------|---------------------------|------------------------------------|----------------------------|--------------------------|--------------------------------|-------------------|
| Sooty Grouse             | 5%                      | Substantial           | Local                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | No                |
| Hairy Woodpecker         | 5%                      | Substantial           | Local                     | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Steller's Jay            | 4%                      | Moderate              | Local                     | > 400,000                          | < 25%                      | Yearround                | Species                        | Yes               |
| Hammond's Flycatcher     | 4%                      | Moderate              | Local                     | 100,001 to 400,000                 | < 25%                      | Breeding                 | Species                        | No                |
| Ermine                   | 4%                      | Substantial           | Local                     | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Swainson's Thrush        | 4%                      | Substantial           | Local                     | > 400,000                          | < 25%                      | Breeding                 | Species                        | No                |
| Meadow vole              | 3%                      | Substantial           | Local                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | No                |
| Root vole                | 2%                      | Substantial           | None                      | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Wilson's Snipe           | 2%                      | Moderate              | Local                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | No                |
| Northwestern Crow        | 2%                      | Moderate              | Local                     | > 400,000                          | 25 to 49%                  | Yearround                | Species                        | No                |
| Northern red-backed vole | 2%                      | Substantial           | Local                     | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Pine Grosbeak            | 1%                      | Moderate              | Local                     | > 400,000                          | < 25%                      | Yearround                | Genus                          | No                |
| Dark-eyed Junco          | 1%                      | Moderate              | Local                     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | No                |
| Cliff Swallow            | 1%                      | Moderate              | Local                     | > 400,000                          | < 25%                      | Breeding                 | Species                        | No                |
| Hermit Thrush            | 1%                      | Substantial           | Local                     | > 400,000                          | < 25%                      | Breeding                 | Species                        | No                |
| Wood frog                | 0%                      | Substantial           | Local                     | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |

Table 11. Taxa in need of increased research efforts in Alaska. Factors that are limiting to taxa are not well known (research score = 10) and population trend is known or is suspected to be declining in Alaska (population trend > 2). Taxa are listed in order of decreasing biological scores with biological scores expressed as percentage of taxa that rank below them. Range scores were included to demonstrate the spatial extent that requires consideration if statewide research efforts are to be implemented and percent global population scores were included to illustrate the global responsibility that Alaska has for each taxa. Alaska occurrence, systematic significance, and peripheral are supplemental variables.

| <b>Common name</b>                                  | <b>Biological score</b> | <b>Population trend</b> | <b>Range size (km<sup>2</sup>)</b> | <b>% Global population</b> | <b>Alaska occurrence</b> | <b>Systematic significance</b> | <b>Peripheral</b> |
|---|-------------------------|-------------------------|------------------------------------|----------------------------|--------------------------|--------------------------------|-------------------|
| Steller's Eider                                     | 99%                     | Known declining         | 10,001 to 100,000                  | 75 to 89%                  | Yearround                | Genus                          | No                |
| North Pacific right whale,<br>Eastern North Pacific | 98%                     | Suspected declining     | > 400,000                          | Unknown                    | Yearround                | Species                        | No                |
| Root vole, Shumagin Island                          | 92%                     | Suspected declining     | 101 to 1,000                       | Endemic                    | Yearround                | Subspecies                     | No                |
| Alaskan hare, poadromus                             | 84%                     | Suspected declining     | 100,001 to 400,000                 | Endemic                    | Yearround                | Subspecies                     | No                |
| Sanderling  | 84%                     | Suspected declining     | 10,001 to 100,000                  | < 25%                      | Yearround                | Species                        | Yes               |
| Columbia spotted frog                               | 80%                     | Suspected declining     | 1,001 to 10,000                    | < 25%                      | Yearround                | Species                        | Yes               |
| Arctic Loon   | 78%                     | Suspected declining     | 10,001 to 100,000                  | < 25%                      | Breeding                 | Species                        | Yes               |
| Surfbird  | 78%                     | Suspected declining     | 100,001 to 400,000                 | 75 to 89%                  | Yearround                | Genus                          | No                |
| Ivory Gull  | 71%                     | Suspected declining     | 10,001 to 100,000                  | < 25%                      | Nonbreeding              | Genus                          | Yes               |
| Black Swift   | 69%                     | Suspected declining     | 10,001 to 100,000                  | < 25%                      | Yearround                | Genus                          | Yes               |
| Red Knot  | 69%                     | Suspected declining     | 10,001 to 100,000                  | < 25%                      | Breeding                 | Species                        | Yes               |
| Killdeer  | 67%                     | Suspected declining     | 10,001 to 100,000                  | < 25%                      | Yearround                | Species                        | Yes               |
| Eastern Kingbird                                    | 58%                     | Suspected declining     | 10,001 to 100,000                  | < 25%                      | Breeding                 | Species                        | Yes               |
| Horned Grebe  | 56%                     | Suspected declining     | 100,001 to 400,000                 | Unknown                    | Yearround                | Species                        | No                |
| Northern Harrier                                    | 56%                     | Suspected declining     | 10,001 to 100,000                  | < 25%                      | Yearround                | Genus                          | No                |
| Red-faced Cormorant                                 | 52%                     | Suspected declining     | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Red-winged Blackbird                                | 50%                     | Suspected declining     | 10,001 to 100,000                  | < 25%                      | Yearround                | Species                        | Yes               |
| Upland Sandpiper                                    | 45%                     | Suspected declining     | 100,001 to 400,000                 | < 25%                      | Breeding                 | Genus                          | Yes               |
| Lesser Yellowlegs                                   | 34%                     | Suspected declining     | > 400,000                          | 25 to 49%                  | Breeding                 | Species                        | No                |
| American Redstart                                   | 30%                     | Suspected declining     | 10,001 to 100,000                  | < 25%                      | Breeding                 | Genus                          | Yes               |
| Belted Kingfisher                                   | 30%                     | Suspected declining     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | No                |
| Blackpoll Warbler                                   | 30%                     | Known declining         | > 400,000                          | 25 to 49%                  | Breeding                 | Species                        | No                |
| Western toad  | 29%                     | Suspected declining     | 100,001 to 400,000                 | < 25%                      | Yearround                | Species                        | Yes               |



Table 11, continued.

| <b>Common name</b>    | <b>Biological score</b> | <b>Population trend</b> | <b>Range size (km<sup>2</sup>)</b> | <b>% Global population</b> | <b>Alaska occurrence</b> | <b>Systematic significance</b> | <b>Peripheral</b> |
|-----------------------|-------------------------|-------------------------|------------------------------------|----------------------------|--------------------------|--------------------------------|-------------------|
| Western Wood-pewee    | 23%                     | Suspected declining     | 100,001 to 400,000                 | < 25%                      | Breeding                 | Species                        | Yes               |
| Black-bellied Plover  | 14%                     | Suspected declining     | 100,001 to 400,000                 | 25 to 49%                  | Breeding                 | Species                        | No                |
| Short-eared Owl       | 14%                     | Suspected declining     | > 400,000                          | < 25%                      | Yearround                | Species                        | No                |
| Bank Swallow          | 10%                     | Suspected declining     | > 400,000                          | < 25%                      | Breeding                 | Species                        | No                |
| Pacific Golden-plover | 6%                      | Suspected declining     | > 400,000                          | < 25%                      | Breeding                 | Species                        | No                |

## CONCLUSIONS AND RECOMMENDATIONS

Our goal was to develop a ranking system that would assist the ADF&G Nongame Program with setting priorities for wildlife conservation. The approach presented here provides an objective procedure for evaluating the status of vertebrate taxa in Alaska. The strengths of the ASRS include: answers to criteria are transparent and repeatable, ranks can be updated as better information becomes available, consistent criteria are used for all taxa, and there is flexibility in setting priorities as a result of separate subscores and sorting mechanisms. Results of the ASRS can now be used as a decision support tool to identify priority taxa for conservation and suggest gaps in our current knowledge that could be addressed by a variety of partners/organizations.

Although we used the Millsap et al. (1990) classification system to guide development of the ASRS, it still took considerable time to modify the ranking and scoring system so that it was Alaska specific and better suited to ADF&G's needs. This included two reviews by ADF&G staff, one after completion of the pilot project and another after all the taxa had been ranked, but not reviewed. Each review resulted in modifications to the ranking and scoring system. It is likely that further modifications may be warranted as ADF&G begins to use the system to address specific conservation issues in Alaska.

Our knowledge of the ecology of vertebrate taxa in Alaska is far from complete; therefore any ranking system will be imperfect. Prioritization accuracy depends highly on the availability and quality of data (Baldi et al. 2001). Expert evaluation of unknown criteria could greatly improve the strength of the ranking system and subsequent results. Due to time and budgetary constraints, only a partial expert review of the criteria was completed. We recommend a full review for the remaining taxa as well as a peer review of the ranking system itself.

Results from the variable analyses were not used to adjust the ranking system. Instead, they were included to alert users of the potential biases and limitations of the ASRS. In order to address the full array of wildlife-related issues in the state and fairly evaluate the system, a comprehensive assessment of all taxa is desirable. Millsap et al. (1990) ranked all vertebrate taxa in the state of Florida (including fishes) and found that the objective view provided by taxa ranks steered the Florida Nongame Wildlife Program into areas that were not intuitively obvious beforehand. Similar to Florida, we recommend a full ranking for all terrestrial vertebrate taxa in Alaska.

The scope and uses of the ASRS exceed the results contained within this report. An Access database was developed to house all the species information gathered during this effort. The database provides biological and action scores based on the best available knowledge. To fully interpret and use the scores to guide decisions regarding conservation, users of the system should read the criteria justification provided in the database and acknowledge the extent of the expert review prior to drawing conclusions. We encourage users of the system to familiarize themselves with the ranking criteria and develop queries that are specific to the question(s) being asked. It is our hope that this database will continue to be updated as new information becomes available and will become a dynamic tool to help guide decision making by ADF&G for years to come.

We hope that the results of this report and the corresponding ASRS database will be used by the ADF&G Nongame Program and others to guide conservation decisions regarding Alaska's wildlife. However, we would like to emphasize that this report should be viewed as a living document. AKNHP is currently working with the ADF&G Nongame Program to initiate the final phase of this project. During the next three years we intend to: 1) complete ranking all remaining birds and mammals in Alaska; 2) update nomenclature and Heritage status ranks for previously ranked taxa; 3) update biological and action information for ASRS high ranking species; 4) make the ASRS database web accessible and automate the review process; 5) conduct a comprehensive expert review and incorporate those comments; and lastly, 6) conduct a project roll-out to present the database to potential users.

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**What is the objective of the Alaska Species Ranking System (ASRS)?**

The goal of ASRS is to develop and implement a logical, consistent and transparent ranking system for wildlife species with conservation needs identified in Alaska’s Comprehensive Wildlife Conservation Strategy (CWCS).

**What is the CWCS and how can I find out more about it?**

Between 2003 and 2005, the Alaska Department of Fish and Game (ADF&G) led an effort to develop a comprehensive state wildlife conservation strategy for Alaska. With the completion and approval of Alaska’s CWCS in 2005, the ADF&G became eligible for congressional State Wildlife Grant (SWG) appropriations. The SWG program provides federal funds to states for the development and implementation of programs that benefit the full array of a state's wildlife (including birds, mammals, reptiles, amphibians, fish and aquatic and terrestrial invertebrates) and their habitats, especially species that have been underrepresented by traditional funding sources.

For more information please visit:

<http://www.sf.adfg.state.ak.us/statewide/ngplan/index.cfm>

**Is ASRS a directive of the CWCS?**

The goal of Alaska’s CWCS (or “Strategy”) is to conserve the diversity of Alaska’s wildlife resources, focusing on those species with the greatest conservation need. Initially, the Alaska CWCS compiled a list of nominee taxa that contained 400 species of greatest conservation need. Although a number of evaluation criteria were considered to develop the nominee list, no criteria were used to objectively score species. This approach, along with the sizeable number of species, has limitations for guiding future project and funding decisions.

To help remedy this, the CWCS identified the need for an objective ranking process and suggested that a key requirement was to complete a systematic statewide species ranking process as part of the state’s initial implementation effort. The ASRS was developed to meet this need. Results of the ASRS will be used to provide up-to-date species level information for strategic decision making, better-inform cooperators, allow for better inter-divisional coordination, and increase public support for wildlife conservation expenditures.

**What are the advantages of the ASRS?**

Advantages of the ASRS include scores that are explicit and traceable, the ability to update ranks as better information becomes available, and flexibility in setting priorities as a result of separate subscores and sorting mechanisms.

**What criteria were used to rank taxa and how were these selected?**

The ASRS closely follows the ranking scheme developed by Millsap et al. (1990) for the Florida Fish and Wildlife Conservation Commission (FF&WCC), although modifications (highlighted below) were made to improve its applicability to Alaska. Taxa are ranked based on two components: 1) **Biological Scores** represent biological vulnerability and are the sum of

eight variables that reflect different aspects of a taxon's distribution, abundance and life history; 2) **Action Scores** are the sum of individual scores for four variables that reflect the current state of knowledge regarding population status and the extent of conservation efforts directed toward a given taxon within Alaska. The ASRS also includes four **Supplemental Variables**, which are used to sort taxa to answer specific questions in relation to taxonomic significance, season of occurrence, harvest and whether or not a taxon is peripheral.

#### **Where did the information for scoring come from?**

Information on individual species biology and conservation status came from the Alaska Natural Heritage Program's (AKNHP) database, peer-reviewed and gray literature, larger compilations (i.e. Birds of North America, marine mammal stock assessments), research data (i.e. BBS data, smaller agency datasets), and expert opinion.

#### **What does it mean when a species has a high biological score?**

A high biological score indicates that the species is more vulnerable to extirpation based on the best available population and life history information.

#### **What is the possible range of biological scores?**

Biological scores range from -80 (least vulnerable) to 80 (most vulnerable).

#### **What does it mean when a species has a high action score?**

High action scores denote taxa with greater information needs due of lack of knowledge or conservation action.

#### **What is the possible range of action scores?**

Action scores range from -40 (fewer information needs) to 40 (more information needs).

#### **Why are some scores negative?**

The Millsap et al. (1990) system, which served as the model for the ASRS, ranked biological and action variables on a scale of 0 to 10. When data were unavailable and expert opinion was lacking, the variable was considered unknown and received the lowest possible score (i.e. unknowns are assigned a value of zero). Consequently, taxa that were less known tended to be classified as less threatened. To better address the problem of missing data and to avoid scoring lesser known taxa as less threatened, we modified the ASRS scoring system so that scores for an individual variable range from 10 (highest) to -10 (lowest). In this positive to negative scoring system, missing data are assigned a value of 0, thereby receiving the middle score as opposed to the lowest score.

#### **How did the ASRS incorporate unknown or missing information?**

When an answer to a variable was deemed "unknown" we attempted to find species experts that could provide the needed information. If expert opinion was unavailable and the answer remained "unknown", it was assigned a value of 0 (the middle score). See previous question for more details regarding the scoring system.

**How does ASRS deal with uncertainty?**

Within ranking systems such as the ASRS, uncertainty in scoring may arise from temporal, spatial, and environmental stochasticity, sampling variance, or data interpretation. One way to deal with uncertainty is to use weighted averages, because they provide the best balance between straightforward calculation and incorporating the full probability distribution. To account for uncertainty within the ASRS, the assessor is able to assign a probability to each response category when the response spanned two to three answers. From this, a weighted average is calculated for each attribute.

**Are all wildlife species in Alaska included in the current ranking system?**

No. Species selection for inclusion in the ASRS was driven by the CWCS Nominee Species List (Appendix 7 of the CWCS), which contained approximately 400 species of greatest conservation need in the state. We modified the Nominee Species List to reflect any recent changes to conservation status, taxonomic status, and occurrence in Alaska and excluded any taxa considered accidental and casual in their occurrence. Although two fish species were included during the pilot testing to insure that the ASRS worked across all taxa, fishes and invertebrates were excluded from the remainder of the ranking process. Overall, a total of 341 species, subspecies, or populations were included in the ranking including: 213 birds, 122 mammals, and 6 amphibians.

**Are scores based on range wide information or restricted to information about the species in Alaska?**

Both biological and action scores are based on a state wide perspective. This differs from the Millsap et al. (1990) system, which responded to the biological variables from a range wide (global) perspective (e.g., Population size: the estimated number of adults throughout the range of the taxon). We believe that conservation efforts in Alaska best address range wide issues by focusing conservation on taxa that face challenges within the state, as opposed to taxa that are challenged elsewhere but are secure in Alaska. However, range wide information was sometimes used to answer questions when state specific information was not available (e.g, range wide habitat requirements were often used when state level information was unavailable).

**Are subspecies, populations, and marine mammal “stocks” included in the ASRS?**

Yes, subspecies, populations, and marine mammal “stocks” identified in CWCS are included in ASRS. To enable users of the ASRS to query the system based on systematic significance of the taxon, we included a supplemental variable that allows for sorting based on whether a taxon is a monotypic family, monotypic genus, monotypic species, disjunct population below the species level, or an intergrading subspecies.

**How was ASRS reviewed?**

System development included a pilot project to rank a subset of the nominee taxa and evaluate the ranking system, an internal review by ADF&G Nongame staff after all taxa were ranked, an expert review for taxa with missing or uncertain information, and a consistency check across all variables.



**What constitutes a peripheral taxon?**

We define peripheral as any taxon at the edge of its range with less than 10% of its global range known to occur in Alaska. Due to Alaska's unique geography, many taxa that occur in the state are at the northernmost limits of their ranges or occur irregularly in the state for very short time periods. While it is important to consider peripheral taxa in conservation decision making, it is also important to recognize that a taxon may be considered rare in Alaska because it is at the periphery of its range, but the same taxon may be widespread elsewhere. To assist resource managers in distinguishing those taxa for which Alaska bears significant global stewardship responsibility, we included a sorting variable in the ASRS to indicate "peripheral taxa."

**What are some ways the ASRS can be used?**

The information contained within the ASRS project database can be queried in a myriad of ways to answer specific questions and set priorities regarding the conservation of Alaska's wildlife. High biological scores can be used to identify taxa that are biologically vulnerable, while high action scores can be used to recognize taxa with greater information needs in regards to survey, monitoring, research and management. In addition to using straight biological and action scores to identify priority conservation targets, we also devised a categorical approach that combined the results of biological and action scores to assign taxa to different groups including those with high conservation needs, high biological vulnerability, high action needs, low conservation needs, peripheral taxa, and migrant taxa with small populations. We felt that the categorical approach was able to capture taxa that are priorities for conservation, while providing more insight into the specific reasons why. To help managers make more informed decisions in regards to conservation status, we also developed separate lists for each of the action criteria and provided explanations of how the lists could be sorted to identify priorities for surveys, monitoring and research.

Although we have provided several examples of how the results of the ASRS may be used to set priorities for conservation, they are by no means complete and we encourage users of the system to familiarize themselves with the ranking criteria and develop queries that are specific to the question(s) being asked.

**Will the ASRS ever be expanded?**

AKNHP is currently working with ADF&G to initiate the final phase of this project. The remainder of the project will include: 1) Completing ranking for all the remaining birds and mammals in Alaska; 2) Updating nomenclature and Heritage ranks for previously ranked taxa; 3) Updating ASRS ranks for high ranking species; 4) Making the ASRS database web accessible and automating the review process; 5) Conducting and incorporating expert reviews; 6) Conducting a project rollout to present the database to users.

Appendix II. List of 26 species used in pilot testing to assess the accuracy and consistency of the Alaska ranking criteria. The table includes ASRS biological scores, action scores, and state and global conservation status ranks. Refer to Appendix V for Global and State rank definitions.

| <b>Taxa</b>                                       | <b>Biological score</b> | <b>Action score</b> | <b>Global rank</b> | <b>State rank</b> |
|---|-------------------------|---------------------|--------------------|-------------------|
| <b>Amphibians</b>                                 |                         |                     |                    |                   |
| Northwestern salamander                           | -27.8                   | 32.0                | G5                 | S3                |
| Western toad                                      | -40.6                   | -2.0                | G4                 | S3S4              |
| Wood frog   | -70.2                   | 8.0                 | G5                 | S5                |
| <b>Birds</b>                                      |                         |                     |                    |                   |
| King Eider  | -25.0                   | 4.0                 | G5                 | S3B, S3N          |
| Red-throated Loon                                 | -46.2                   | -4.0                | G5                 | S4B, S4N          |
| Merlin  | -48.4                   | 2.0                 | G5                 | S5B, S4N          |
| Lesser Yellowlegs                                 | -38.0                   | 15.2                | G5                 | S5B               |
| Bristle-thighed Curlew                            | -12.0                   | 4.0                 | G2                 | S2B               |
| Surfbird  | -10.0                   | 16.0                | G5                 | S2N, S3B          |
| Ivory Gull  | -14.5                   | 34.0                | G5                 | S3N               |
| Crested Auklet                                    | -29.6                   | -16.0               | G5                 | S5                |
| Northern Pygmy-owl                                | -28.0                   | 16.0                | G5                 | S3                |
| Olive-sided Flycatcher                            | -48.0                   | 8.0                 | G4                 | S4S5B             |
| Red-eyed Vireo                                    | -31.5                   | 24.0                | G5                 | S3B               |
| <b>Mammals</b>                                    |                         |                     |                    |                   |
| Root vole, Montague Island                        | -1.6                    | 20.0                | G5T3               | S3                |
| Northwestern deermouse                            | -48.5                   | 10.0                | G5                 | S4                |
| Collared pika                                     | -34.0                   | 22.0                | G5                 | S5                |
| St. Lawrence Island shrew                         | -25.6                   | 32.0                | G4                 | S4                |
| Little brown myotis                               | -31.4                   | 16.0                | G5                 | S4                |
| Canadian lynx                                     | -31.6                   | -16.0               | G5                 | S4                |
| Walrus  | -10.5                   | -16.0               | G4                 | S3                |
| Harbor seal                                       | -46.0                   | -8.0                | G5                 | S4S5              |
| Humpback whale, Central and Western North Pacific | -46.0                   | -22.0               | G3                 | S3                |
| Beluga whale, Cook Inlet population               | 42.0                    | -40.0               | G4                 | S4                |
| <b>Fishes</b>                                     |                         |                     |                    |                   |
| Bering cisco                                      | -11.0                   | 20.0                | G4                 | S4                |
| Western brook lamprey                             | 2.4                     | 40.0                | G4G5               | S1S2              |

Appendix III. Nominee taxa ranked (n=341) in order of descending biological score. The table includes individual biological scores, action scores, global and state conservation status ranks, and supplemental variables: Alaska occurrence, systematic significance, level of harvest and peripheral status. Biological and action scores are denoted by the numerical score, followed by the percentage of taxa that ranked below them (in parentheses). Refer to Appendix V for Global and State rank definitions.

| <b>Taxa</b>   | <b>Biological score</b> | <b>Action score</b> | <b>Global rank</b> | <b>State rank</b> | <b>Alaska occurrence</b> | <b>Systematic significance</b> | <b>Harvest</b>    | <b>Peripheral</b> |
|---|-------------------------|---------------------|--------------------|-------------------|--------------------------|--------------------------------|-------------------|-------------------|
| Beluga whale, Cook Inlet population<br>( <i>Delphinapterus leucas</i> )               | 42.0 (100%)             | -40.0 (0%)          | G4                 | S4                | Yearround                | Population                     | Not substantial   | No                |
| Eskimo Curlew<br>( <i>Numenius borealis</i> )   | 27.0 (100%)             | 18.0 (60%)          | G1                 | SH                | Breeding                 | Species                        | Not harvested     | No                |
| Brown bear, Kenai population<br>( <i>Ursus arctos kenai</i> )                         | 26.0 (99%)              | -26.0 (2%)          | GNR                | SNR               | Yearround                | Population                     | Substantial, regs | No                |
| Steller's Eider<br>( <i>Polysticta stelleri</i> )                                     | 25.4 (99%)              | -0.4 (21%)          | G3                 | S2B, S3N          | Yearround                | Genus                          | Not harvested     | No                |
| Brandt's Cormorant<br>( <i>Phalacrocorax penicillatus</i> )                           | 22.4 (99%)              | -16.0 (5%)          | G5                 | S1B               | Yearround                | Species                        | Not substantial   | Yes               |
| North Pacific right whale, Eastern North Pacific<br>( <i>Eubalaena japonica</i> )     | 15.5 (98%)              | 0.0 (21%)           | G1                 | S1                | Yearround                | Species                        | Not harvested     | No                |
| Polar bear<br>( <i>Ursus maritimus</i> )  | 15.5 (98%)              | -16.0 (5%)          | G3G4               | S2                | Yearround                | Species                        | Not substantial   | No                |
| Rock Ptarmigan, Evermann's<br>( <i>Lagopus mutus evermanni</i> )                      | 15.0 (98%)              | -20.0 (4%)          | G5T2               | S2                | Yearround                | Subspecies                     | Not substantial   | No                |
| White-fronted Goose, Tule<br>( <i>Anser albifrons elgasi</i> )                        | 14.0 (98%)              | 2.0 (24%)           | G5T1T2             | S1S2B             | Breeding                 | Subspecies                     | Substantial, regs | No                |
| Hoary marmot, Montague Island<br>( <i>Marmota caligata sheldoni</i> )                 | 13.2 (97%)              | 32.0 (81%)          | G5T2T3             | S2S3              | Yearround                | Subspecies                     | Not substantial   | No                |
| Cackling Goose, Aleutian<br>( <i>Branta hutchinsii leucopareia</i> )                  | 12.4 (97%)              | -32.0 (1%)          | G3                 | S3B               | Breeding                 | Subspecies                     | Not substantial   | No                |
| Rock Ptarmigan, Turner's<br>( <i>Lagopus mutus atkensis</i> )                         | 11.0 (97%)              | -8.0 (11%)          | G5T2T3             | S2S3              | Yearround                | Subspecies                     | Not substantial   | No                |
| Northern flying squirrel, Prince of Wales<br>( <i>Glaucmys sabrinus griseifrons</i> ) | 10.5 (96%)              | -8.0 (11%)          | G5T2               | S2                | Yearround                | Subspecies                     | Not substantial   | No                |
| Slaty-backed Gull<br>( <i>Larus schistisagus</i> )                                    | 9.0 (96%)               | 32.0 (81%)          | G5                 | S2B               | Yearround                | Species                        | Substantial, regs | Yes               |
| Rock Ptarmigan, Townsend's<br>( <i>Lagopus mutus townsendi</i> )                      | 9.0 (96%)               | -8.0 (11%)          | G5T2T3             | S2S3              | Yearround                | Subspecies                     | Not substantial   | No                |

## Appendix III, continued.

| Taxa   | Biological score | Action score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest           | Peripheral |
|--|------------------|--------------|-------------|------------|-------------------|-------------------------|-------------------|------------|
| Arctic ground squirrel, Osgood's<br>( <i>Spermophilus parryii osgoodi</i> )          | 8.1 (96%)        | 36.0 (94%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial   | No         |
| Glacier Bay water shrew<br>( <i>Sorex alaskanus</i> )                                | 7.0 (95%)        | 40.0 (97%)   | GH          | SH         | Yearround         | Species                 | Not substantial   | No         |
| Hoary marmot, Glacier Bay<br>( <i>Marmota caligata vigilis</i> )                     | 6.0 (95%)        | 40.0 (97%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial   | No         |
| Brown lemming, black-footed<br>( <i>Lemmus trimucronatus nigripes</i> )              | 6.0 (95%)        | 24.0 (65%)   | G5T2        | S2         | Yearround         | Subspecies              | Not substantial   | No         |
| Rock Sandpiper, Pribilof<br>( <i>Calidris ptilocnemis ptilocnemis</i> )              | 4.0 (94%)        | 8.0 (33%)    | G5T3        | S3B, S2N   | Yearround         | Subspecies              | Not harvested     | No         |
| Arctic ground squirrel, Kodiak Island<br>( <i>Spermophilus parryii kodiacensis</i> ) | 2.6 (94%)        | 36.0 (94%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial   | No         |
| Spruce Grouse, Prince of Wales<br>( <i>Falcapennis canadensis isleibi</i> )          | 2.3 (94%)        | 24.0 (65%)   | GNR         | SNR        | Yearround         | Population              | Substantial, regs | No         |
| Root vole, Shumagin Island<br>( <i>Microtus oeconomus popofensis</i> )               | 2.0 (92%)        | 40.0 (97%)   | G5T2        | S2         | Yearround         | Subspecies              | Not substantial   | No         |
| Collared lemming, St. Lawrence Island<br>( <i>Dicrostonyx groenlandicus exsul</i> )  | 2.0 (92%)        | 36.0 (94%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial   | No         |
| McKay's Bunting<br>( <i>Plectrophenax hyperboreus</i> )                              | 2.0 (92%)        | 4.0 (25%)    | G3          | S3         | Yearround         | Species                 | Not harvested     | No         |
| Song Sparrow, Aleutian<br>( <i>Melospiza melodia maxima</i> )                        | 2.0 (92%)        | 4.0 (25%)    | G5T4        | S3         | Yearround         | Subspecies              | Not harvested     | No         |
| Winter Wren, Semidi<br>( <i>Troglodytes troglodytes semidiensis</i> )                | 2.0 (92%)        | -2.0 (20%)   | G5T2T3      | S2S3       | Yearround         | Subspecies              | Not harvested     | No         |
| Beaver, Admiralty<br>( <i>Castor canadensis phaeus</i> )                             | 1.0 (92%)        | 12.0 (42%)   | G5T3        | S3         | Yearround         | Subspecies              | Not harvested     | No         |
| Kittlitz's Murrelet<br>( <i>Brachyramphus brevirostris</i> )                         | 0.8 (92%)        | 10.4 (42%)   | G2          | S2B,S2N    | Yearround         | Species                 | Not substantial   | No         |
| Red-legged Kittiwake<br>( <i>Rissa brevirostris</i> )                                | 0.4 (91%)        | 5.0 (32%)    | G2G3        | S2S3B, S2N | Yearround         | Species                 | Not substantial   | No         |
| Winter Wren, Pribilof<br>( <i>Troglodytes troglodytes alascensis</i> )               | 0.0 (91%)        | 10.0 (41%)   | G5T2        | S2         | Yearround         | Subspecies              | Not harvested     | No         |
| Ermine, Admiralty Island<br>( <i>Mustela erminea salva</i> )                         | -0.4 (91%)       | 24.0 (65%)   | G5T2T3      | S2S3       | Yearround         | Subspecies              | Substantial, regs | No         |

Appendix III, continued.

| Taxa  | Biological score | Action score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest           | Peripheral |
|---|------------------|--------------|-------------|------------|-------------------|-------------------------|-------------------|------------|
| Root vole, Montague Island<br>( <i>Microtus oeconomus elymocetes</i> )            | -1.6 (91%)       | 20.0 (61%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial   | No         |
| California myotis<br>( <i>Myotis californicus</i> )                               | -1.6 (90%)       | 32.0 (81%)   | G3G4        | S2         | Yearround         | Species                 | Not harvested     | Yes        |
| Collared lemming, Stevenson's<br>( <i>Dicrostonyx groenlandicus stevensoni</i> )  | -2.0 (89%)       | 36.0 (94%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial   | No         |
| Collared lemming, Unalaska<br>( <i>Dicrostonyx groenlandicus unalascensis</i> )   | -2.0 (89%)       | 36.0 (94%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial   | No         |
| Woodland caribou, Chisana herd<br>( <i>Rangifer tarandus caribou</i> )            | -2.0 (89%)       | -40.0 (0%)   |             | SNR        | Yearround         | Population              | Not harvested     | No         |
| River otter, Prince of Wales<br>( <i>Lontra canadensis mira</i> )                 | -2.4 (89%)       | 24.0 (65%)   | G5T3        | S3         | Yearround         | Subspecies              | Substantial, regs | No         |
| American Coot<br>( <i>Fulica americana</i> )                                      | -3.0 (89%)       | 32.0 (81%)   | G5          | S2B, S2N   | Yearround         | Species                 | Not substantial   | Yes        |
| Common Greenshank<br>( <i>Tringa nebularia</i> )                                  | -3.0 (89%)       | 24.0 (65%)   | G5          | S2M        | Transient         | Species                 | Not harvested     | No         |
| Root vole, Punuk Island<br>( <i>Microtus oeconomus punukensis</i> )               | -3.8 (88%)       | 24.0 (65%)   | G5T2        | S2         | Yearround         | Subspecies              | Not substantial   | No         |
| Insular vole, Hall Island<br>( <i>Microtus abbreviatus abbreviatus</i> )          | -4.0 (87%)       | 40.0 (97%)   | G3T3        | S3         | Yearround         | Subspecies              | Not substantial   | No         |
| Keen's myotis<br>( <i>Myotis keenii</i> )   | -4.0 (87%)       | 32.0 (81%)   | G2G3        | S1S2       | Breeding          | Species                 | Not harvested     | No         |
| Long-tailed vole, Coronation Island<br>( <i>Microtus longicaudus coronarius</i> ) | -4.0 (87%)       | 32.0 (81%)   | G3T3        | S3         | Yearround         | Subspecies              | Not substantial   | No         |
| Dusky shrew, Warren Island<br>( <i>Sorex monticolus malitiosus</i> )              | -4.0 (87%)       | 28.0 (77%)   | G5T3Q       | S3Q        | Yearround         | Subspecies              | Not substantial   | No         |
| Rock Sandpiper, Aleutian<br>( <i>Calidris ptilocnemis couesi</i> )                | -4.0 (87%)       | 24.0 (65%)   | GNR         | S2S3       | Yearround         | Subspecies              | Not harvested     | No         |
| Gray-tailed Tattler<br>( <i>Heteroscelus brevipes</i> )                           | -5.2 (86%)       | 32.0 (81%)   | G4G5        | S3M        | Transient         | Species                 | Not harvested     | Yes        |
| Sei whale, North Pacific<br>( <i>Balaenoptera borealis</i> )                      | -5.4 (86%)       | 12.0 (42%)   | G3          | S3         | Transient         | Species                 | Not harvested     | No         |
| Northwestern deermouse, sitkensis<br>( <i>Peromyscus keeni sitkensis</i> )        | -5.5 (86%)       | 32.0 (81%)   | GNR         | SNR        | Yearround         | Subspecies              | Not substantial   | No         |

Appendix III, continued.

| <b>Taxa</b>  | <b>Biological score</b> | <b>Action score</b> | <b>Global rank</b> | <b>State rank</b> | <b>Alaska occurrence</b> | <b>Systematic significance</b> | <b>Harvest</b>       | <b>Peripheral</b> |
|--|-------------------------|---------------------|--------------------|-------------------|--------------------------|--------------------------------|----------------------|-------------------|
| Brown lemming, Nunivak Island<br>( <i>Lemmus trimucronatus harroldi</i> )              | -6.0 (84%)              | 32.0 (81%)          | G5T3T4             | S3S4              | Yearround                | Subspecies                     | Not substantial      | No                |
| Sanderling<br>( <i>Calidris alba</i> )   | -6.0 (84%)              | 32.0 (81%)          | G5                 | S2B               | Yearround                | Species                        | Not harvested        | Yes               |
| Alaskan hare, poadromus<br>( <i>Lepus othus poadromus</i> )                            | -6.0 (84%)              | 30.0 (81%)          | GNR                | SNR               | Yearround                | Subspecies                     | Substantial, no regs | No                |
| Black Guillemot<br>( <i>Cepphus grylle</i> )   | -6.0 (84%)              | 18.0 (60%)          | G5                 | S2                | Yearround                | Species                        | Not substantial      | Yes               |
| Western Sandpiper<br>( <i>Calidris mauri</i> )   | -6.0 (84%)              | 4.0 (25%)           | G5                 | S5B               | Breeding                 | Species                        | Not substantial      | No                |
| Arctic ground squirrel, St. Lawrence Island<br>( <i>Spermophilus parryii lyratus</i> ) | -6.4 (84%)              | 40.0 (97%)          | G5T3               | S3                | Yearround                | Subspecies                     | Not substantial      | No                |
| Ermine, Suemez Island<br>( <i>Mustela erminea seclusa</i> )                            | -6.4 (84%)              | 16.0 (51%)          | G5T3               | S3                | Yearround                | Subspecies                     | Substantial, regs    | No                |
| Spectacled Eider<br>( <i>Somateria fischeri</i> )                                      | -7.0 (84%)              | -20.0 (4%)          | G2                 | S2B, S2N          | Yearround                | Species                        | Not harvested        | No                |
| Collared lemming, peninsulae<br>( <i>Dicrostonyx groenlandicus peninsulae</i> )        | -8.0 (81%)              | 36.0 (94%)          | GNR                | SNR               | Yearround                | Subspecies                     | Not substantial      | No                |
| Root vole, Sitka<br>( <i>Microtus oeconomus sitkensis</i> )                            | -8.0 (81%)              | 32.0 (81%)          | G5T2               | S2                | Yearround                | Subspecies                     | Not substantial      | No                |
| Root vole, St. Lawrence Island<br>( <i>Microtus oeconomus innuitus</i> )               | -8.0 (81%)              | 32.0 (81%)          | G5T3               | S3                | Yearround                | Subspecies                     | Not substantial      | No                |
| Northern red-backed vole, Island<br>( <i>Myodes rutilus insularis</i> )                | -8.0 (81%)              | 24.0 (65%)          | G5T3               | S3                | Yearround                | Subspecies                     | Not substantial      | No                |
| Marbled Godwit<br>( <i>Limosa fedoa</i> )  | -8.0 (81%)              | 12.0 (42%)          | G5                 | S2B               | Breeding                 | Species                        | Not substantial      | No                |
| Alaskan hare, othus<br>( <i>Lepus othus othus</i> )                                    | -8.0 (81%)              | 2.0 (24%)           | GNR                | SNR               | Yearround                | Subspecies                     | Substantial, no regs | No                |
| Northern fur seal<br>( <i>Callorhinus ursinus</i> )                                    | -8.0 (81%)              | -12.0 (9%)          | G3                 | S2S3              | Yearround                | Genus                          | Substantial, regs    | No                |
| Northwestern deer mouse, oceanicus<br>( <i>Peromyscus keeni oceanicus</i> )            | -8.5 (81%)              | 32.0 (81%)          | GNR                | SNR               | Yearround                | Subspecies                     | Not substantial      | No                |
| Common Tern<br>( <i>Sterna hirundo</i> )   | -8.5 (81%)              | 24.0 (65%)          | G5                 | S2M               | Transient                | Species                        | Not harvested        | Yes               |

Appendix III, continued.

| <b>Taxa</b>  | <b>Biological score</b> | <b>Action score</b> | <b>Global rank</b> | <b>State rank</b> | <b>Alaska occurrence</b> | <b>Systematic significance</b> | <b>Harvest</b>       | <b>Peripheral</b> |
|--|-------------------------|---------------------|--------------------|-------------------|--------------------------|--------------------------------|----------------------|-------------------|
| Columbia spotted frog<br>( <i>Rana luteiventris</i> )                                  | -9.0 (80%)              | 32.0 (81%)          | G4                 | S2                | Yearround                | Species                        | Not harvested        | Yes               |
| Marten, Kenai<br>( <i>Martes americana kenaiensis</i> )                                | -9.0 (80%)              | 28.0 (77%)          | GNR                | S3                | Yearround                | Subspecies                     | Substantial, regs    | No                |
| Goshawk, Queen Charlotte<br>( <i>Accipiter gentilis laingi</i> )                       | -9.0 (80%)              | -16.0 (5%)          | G5T2               | S2                | Yearround                | Subspecies                     | Not substantial      | No                |
| Bowhead, Western Arctic<br>( <i>Balaena mysticetus</i> -)                              | -9.0 (80%)              | -28.0 (1%)          | G4                 | S3                | Yearround                | Species                        | Not harvested        | No                |
| Insular vole, St. Mathew Island<br>( <i>Microtus abbreviatus fisheri</i> )             | -10.0 (78%)             | 40.0 (97%)          | G3T3               | S3                | Yearround                | Subspecies                     | Not substantial      | No                |
| Root vole, Yakutat<br>( <i>Microtus oeconomus unalascensis</i> )                       | -10.0 (78%)             | 32.0 (81%)          | G5T3               | S3                | Yearround                | Subspecies                     | Not substantial      | No                |
| Arctic Loon<br>( <i>Gavia arctica</i> )  | -10.0 (78%)             | 24.0 (65%)          | G5                 | S1S2B             | Breeding                 | Species                        | Substantial, regs    | Yes               |
| Dovekie<br>( <i>Alle alle</i> )  | -10.0 (78%)             | 24.0 (65%)          | G5                 | S1S2B             | Yearround                | Genus                          | Not harvested        | Yes               |
| Northern red-backed vole, Glacier Bay<br>( <i>Myodes rutilus glacialis</i> )           | -10.0 (78%)             | 24.0 (65%)          | G5T3               | S3                | Yearround                | Subspecies                     | Not substantial      | No                |
| Red squirrel, Kenai<br>( <i>Tamiasciurus hudsonicus kenaiensis</i> )                   | -10.0 (78%)             | 24.0 (65%)          | G5T3?              | SNR               | Yearround                | Subspecies                     | Not substantial      | No                |
| Surfbird<br>( <i>Aphriza virgata</i> )   | -10.0 (78%)             | 16.0 (51%)          | G5                 | S3B, S2N          | Yearround                | Genus                          | Not harvested        | No                |
| Ermine, Baranof<br>( <i>Mustela erminea initis</i> )                                   | -10.4 (77%)             | 16.0 (51%)          | G5T3               | S3                | Yearround                | Subspecies                     | Substantial, regs    | No                |
| Ermine, Prince of Wales<br>( <i>Mustela erminea celenda</i> )                          | -10.4 (77%)             | 8.0 (33%)           | G5T3               | S3                | Yearround                | Subspecies                     | Substantial, regs    | No                |
| Walrus<br>( <i>Odobenus rosmarus</i> )   | -10.5 (77%)             | -16.0 (5%)          | G4                 | S3                | Yearround                | Family                         | Substantial, no regs | No                |
| Wolf, Alexander Archipelago<br>( <i>Canis lupus ligoni</i> )                           | -10.8 (76%)             | 12.0 (42%)          | G4T3               | S3                | Yearround                | Population                     | Substantial, regs    | No                |
| Arctic ground squirrel, Shumagin Islands<br>( <i>Spermophilus parryii nebulicola</i> ) | -11.2 (76%)             | 36.0 (94%)          | G5T3               | S3                | Yearround                | Subspecies                     | Not substantial      | No                |
| Marbled Murrelet<br>( <i>Brachyramphus marmoratus</i> )                                | -11.2 (76%)             | 12.0 (42%)          | G3G4               | S3                | Yearround                | Species                        | Not substantial      | No                |

Appendix III, continued.

| <b>Taxa</b>   | <b>Biological score</b> | <b>Action score</b> | <b>Global rank</b> | <b>State rank</b> | <b>Alaska occurrence</b> | <b>Systematic significance</b> | <b>Harvest</b>          | <b>Peripheral</b> |
|---|-------------------------|---------------------|--------------------|-------------------|--------------------------|--------------------------------|-------------------------|-------------------|
| Alaskan hare<br>( <i>Lepus othus</i> )  | -11.4 (76%)             | 14.0 (50%)          | G3G4               | S3S4              | Yearround                | Species                        | Substantial,<br>no regs | No                |
| Long-legged myotis<br>( <i>Myotis volans</i> )  | -11.6 (75%)             | 28.0 (77%)          | G5                 | S2                | Yearround                | Species                        | Not<br>harvested        | Yes               |
| Rock Sandpiper, Bering Sea<br>( <i>Calidris ptilocnemis tschuktschorum</i> )          | -12.0 (74%)             | 24.0 (65%)          | GNR                | S3B, S2N          | Yearround                | Subspecies                     | Not<br>harvested        | No                |
| Peregrine Falcon, Peale's<br>( <i>Falco peregrinus pealei</i> )                       | -12.0 (74%)             | 8.0 (33%)           | G4T2T3             | S2S3              | Yearround                | Subspecies                     | Not<br>substantial      | No                |
| Bristle-thighed Curlew<br>( <i>Numenius tahitiensis</i> )                             | -12.0 (74%)             | 4.0 (25%)           | G2                 | S2B               | Breeding                 | Species                        | Not<br>harvested        | No                |
| Root vole, Amak Island<br>( <i>Microtus oeconomus amakensis</i> )                     | -12.0 (74%)             | 4.0 (25%)           | G5T2T3             | S2S3              | Yearround                | Subspecies                     | Not<br>substantial      | No                |
| Marten, Pacific<br>( <i>Martes americana caurina</i> )                                | -12.1 (74%)             | 4.0 (25%)           | GNR                | S2                | Yearround                | Subspecies                     | Substantial,<br>regs    | Yes               |
| Merlin, Black<br>( <i>Falco columbarius suckleyi</i> )                                | -12.2 (74%)             | 10.0 (41%)          | G4T4               | S3                | Yearround                | Subspecies                     | Not<br>substantial      | No                |
| Ring-billed Gull<br>( <i>Larus delawarensis</i> )                                     | -13.0 (73%)             | 32.0 (81%)          | G5                 | S3N               | Yearround                | Species                        | Not<br>harvested        | Yes               |
| Southern red-backed vole, Revillagigedo<br>Island ( <i>Myodes gapperi soleus</i> )    | -14.0 (71%)             | 36.0 (94%)          | G5T3               | S3                | Yearround                | Subspecies                     | Not<br>substantial      | No                |
| Southern red-backed vole, Wrangell<br>Island ( <i>Myodes gapperi wrangeli</i> )       | -14.0 (71%)             | 36.0 (94%)          | G5T3               | S3                | Yearround                | Subspecies                     | Not<br>substantial      | No                |
| Northern red-backed vole, St. Lawrence<br>Island ( <i>Myodes rutilus albiventer</i> ) | -14.0 (71%)             | 32.0 (81%)          | G5T3               | S3S4              | Yearround                | Subspecies                     | Not<br>substantial      | No                |
| Stejneger's beaked whale, Alaska<br>( <i>Mesoplodon stejnegeri</i> )                  | -14.0 (71%)             | 32.0 (81%)          | G3                 | S3                | Yearround                | Species                        | Not<br>harvested        | No                |
| Dusky shrew, Yakutat<br>( <i>Sorex monticolus alascensis</i> )                        | -14.0 (71%)             | 24.0 (65%)          | GNR                | SNR               | Yearround                | Subspecies                     | Not<br>substantial      | No                |
| Baird's beaked whale, Alaska ( <i>Berardius<br/>bairdii</i> )                         | -14.0 (71%)             | 12.0 (42%)          | G4                 | S4                | Transient                | Species                        | Not<br>harvested        | No                |
| Pribilof Island shrew<br>( <i>Sorex pribilofensis</i> )                               | -14.0 (71%)             | 12.0 (42%)          | G3                 | S3                | Yearround                | Species                        | Not<br>substantial      | No                |
| Winter Wren, Kiska<br>( <i>Troglodytes troglodytes kiskensis</i> )                    | -14.0 (71%)             | 8.8 (40%)           | G5T2T3             | S2S3              | Yearround                | Subspecies                     | Not<br>harvested        | No                |



## Appendix III, continued.

| Taxa  | Biological score | Action score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest           | Peripheral |
|---|------------------|--------------|-------------|------------|-------------------|-------------------------|-------------------|------------|
| Ivory Gull<br>( <i>Pagophila eburnea</i> )                        | -14.5 (71%)      | 34.0 (94%)   | G5          | S3N        | Nonbreeding       | Genus                   | Substantial, regs | Yes        |
| Great Blue Heron, Pacific<br>( <i>Ardea herodias</i> )            | -15.6 (70%)      | 12.0 (42%)   | G5          | S2S3       | Yearround         | Subspecies              | Not harvested     | No         |
| Insular vole<br>( <i>Microtus abbreviatus</i> )                   | -16.0 (69%)      | 40.0 (97%)   | G3          | S3         | Yearround         | Species                 | Not substantial   | No         |
| Red Knot<br>( <i>Calidris canutus</i> )                           | -16.0 (69%)      | 12.0 (42%)   | G5          | S2S3B      | Breeding          | Species                 | Not harvested     | Yes        |
| Winter Wren, Attu<br>( <i>Troglodytes troglodytes meligerus</i> ) | -16.0 (69%)      | 8.8 (40%)    | G5T3        | S3         | Yearround         | Subspecies              | Not harvested     | No         |
| Black Swift<br>( <i>Cypseloides niger</i> )                       | -16.4 (69%)      | 24.0 (65%)   | G4          | S2N        | Yearround         | Genus                   | Not harvested     | Yes        |
| California Gull<br>( <i>Larus californicus</i> )                  | -17.0 (69%)      | 32.0 (81%)   | G5          | S3N        | Yearround         | Species                 | Not harvested     | Yes        |
| Ruff<br>( <i>Philomachus pugnax</i> )                             | -17.0 (69%)      | 24.0 (65%)   | G5          | S2M        | Transient         | Genus                   | Not harvested     | Yes        |
| Western Screech-Owl<br>( <i>Otus kennicottii</i> )                | -17.4 (68%)      | 8.0 (33%)    | G5          | S2         | Yearround         | Species                 | Not harvested     | Yes        |
| Root vole, Unalaska<br>( <i>Microtus oeconomus unalascensis</i> ) | -18.0 (67%)      | 40.0 (97%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial   | No         |
| Northern red-backed vole, Orca ( <i>Myodes rutilus orca</i> )     | -18.0 (67%)      | 32.0 (81%)   | G5T4        | S4         | Yearround         | Subspecies              | Not substantial   | No         |
| Brambling<br>( <i>Fringilla montifringilla</i> )                  | -18.0 (67%)      | 24.0 (65%)   | G5          | S3N        | Breeding          | Species                 | Not harvested     | Yes        |
| Killer whale<br>( <i>Orcinus orca</i> )                           | -18.0 (67%)      | -4.0 (14%)   | G4G5        | S4         | Yearround         | Species                 | Not harvested     | No         |
| Killdeer<br>( <i>Charadrius vociferus</i> )                       | -18.0 (67%)      | 20.0 (61%)   | G5          | S3S4B      | Yearround         | Species                 | Not harvested     | Yes        |
| Sky Lark<br>( <i>Alauda arvensis</i> )                            | -19.0 (65%)      | 28.0 (77%)   | G5          | S2B        | Breeding          | Genus                   | Not harvested     | Yes        |
| Eye-browed Thrush<br>( <i>Turdus obscurus</i> )                   | -19.0 (65%)      | 24.0 (65%)   | G5          | S3M        | Transient         | Species                 | Not harvested     | Yes        |
| Long-toed Stint<br>( <i>Calidris subminuta</i> )                  | -19.0 (65%)      | 24.0 (65%)   | G4G5        | S3M        | Transient         | Species                 | Not harvested     | Yes        |

Appendix III, continued.

| Taxa   | Biological score | Action score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest           | Peripheral |
|--|------------------|--------------|-------------|------------|-------------------|-------------------------|-------------------|------------|
| Ribbon seal<br>( <i>Histiophoca fasciata</i> )                           | -19.0 (65%)      | -4.0 (14%)   | G5          | S3         | Yearround         | Genus                   | Not substantial   | No         |
| Black Oystercatcher<br>( <i>Haematopus bachmani</i> )                    | -19.0 (65%)      | -5.2 (14%)   | G5          | S2S3B, S2N | Yearround         | Species                 | Substantial, regs | No         |
| Cuvier's beaked whale, Alaska<br>( <i>Ziphius cavirostris</i> )          | -20.0 (63%)      | 32.0 (81%)   | G4          | S3S4       | Yearround         | Species                 | Not harvested     | No         |
| Meadow vole, Admiralty<br>( <i>Microtus pennsylvanicus admiraltiae</i> ) | -20.0 (63%)      | 32.0 (81%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial   | No         |
| Common Sandpiper<br>( <i>Actitis hypoleucos</i> )                        | -20.0 (63%)      | 24.0 (65%)   | G5          | S2M        | Transient         | Species                 | Not harvested     | Yes        |
| Siberian Rubythroat<br>( <i>Luscinia calliope</i> )                      | -20.0 (63%)      | 24.0 (65%)   | G5          | S2M        | Transient         | Species                 | Not harvested     | Yes        |
| Blue whale, North Pacific ( <i>Balaenoptera musculus</i> )               | -20.0 (63%)      | 4.0 (25%)    | G3G4        | S2         | Transient         | Species                 | Not harvested     | No         |
| Bar-tailed Godwit<br>( <i>Limosa lapponica</i> )                         | -20.0 (63%)      | 0.0 (21%)    | G5          | S3B        | Breeding          | Species                 | Substantial, regs | Yes        |
| Caspian Tern<br>( <i>Hydroprogne caspia</i> )                            | -20.0 (63%)      | -8.0 (11%)   | G5          | S1S2B      | Breeding          | Species                 | Not harvested     | Yes        |
| Black Scoter<br>( <i>Melanitta nigra</i> )                               | -20.4 (63%)      | -4.0 (14%)   | G5          | S3S4B, S3N | Yearround         | Species                 | Substantial, regs | Yes        |
| Northwestern deer mouse, hylaeus<br>( <i>Peromyscus keeni hylaeus</i> )  | -20.5 (63%)      | 22.0 (64%)   | GNR         | SNR        | Yearround         | Subspecies              | Not substantial   | No         |
| Eurasian Dotterel<br>( <i>Charadrius morinellus</i> )                    | -21.0 (62%)      | 32.0 (81%)   | G5          | S2B        | Breeding          | Species                 | Not harvested     | Yes        |
| Lesser Sand-Plover<br>( <i>Charadrius mongolus</i> )                     | -21.0 (62%)      | 32.0 (81%)   | G4G5        | S3M        | Breeding          | Genus                   | Not harvested     | Yes        |
| Pink-footed Shearwater<br>( <i>Puffinus creatopus</i> )                  | -21.0 (62%)      | -8.0 (11%)   | G1G2Q       | S1S2N      | Nonbreeding       | Species                 | Not substantial   | No         |
| Fin whale, Northeast Pacific<br>( <i>Balaenoptera physalus</i> )         | -21.0 (61%)      | -4.0 (14%)   | G3G4        | S3         | Transient         | Species                 | Not harvested     | No         |
| American Bittern<br>( <i>Botaurus lentiginosus</i> )                     | -21.8 (61%)      | 24.0 (65%)   | G4          | S3B        | Breeding          | Species                 | Not substantial   | Yes        |
| Band-tailed Pigeon<br>( <i>Patagioenas fasciata</i> )                    | -22.0 (59%)      | 24.0 (65%)   | G5          | S3B        | Breeding          | Species                 | Not harvested     | Yes        |

## Appendix III, continued.

| Taxa  | Biological score | Action score | Global rank | State rank    | Alaska occurrence | Systematic significance | Harvest              | Peripheral |
|---|------------------|--------------|-------------|---------------|-------------------|-------------------------|----------------------|------------|
| Dunlin, Pacific<br>( <i>Calidris alpina pacifica</i> )                      | -22.0 (59%)      | 18.4 (61%)   | GNR         | SNR           | Yearround         | Subspecies              | Not substantial      | No         |
| Winter Wren, Kodiak<br>( <i>Troglodytes troglodytes helleri</i> )           | -22.0 (59%)      | 18.0 (60%)   | G5T3        | S3            | Yearround         | Subspecies              | Not harvested        | No         |
| Tennessee Warbler<br>( <i>Vermivora peregrina</i> )                         | -22.0 (59%)      | 14.4 (51%)   | G5          | S2S3B         | Breeding          | Species                 | Not harvested        | Yes        |
| Dunlin, Arctic<br>( <i>Calidris alpina arctica</i> )                        | -22.0 (59%)      | -4.0 (14%)   | GNR         | SNR           | Yearround         | Subspecies              | Not substantial      | No         |
| Fork-tailed Storm-Petrel, furcata<br>( <i>Oceanodroma furcata furcata</i> ) | -22.0 (59%)      | -28.0 (1%)   | GNR         | SNR           | Yearround         | Subspecies              | Not harvested        | No         |
| Alaska tiny shrew<br>( <i>Sorex yukonicus</i> )                             | -22.8 (59%)      | 32.0 (81%)   | GU          | S3            | Yearround         | Species                 | Not substantial      | No         |
| Sperm whale, North Pacific<br>( <i>Physeter macrocephalus</i> )             | -23.0 (59%)      | -8.0 (11%)   | G3G4        | S3S4          | Transient         | Species                 | Not harvested        | No         |
| Bullers Shearwater<br>( <i>Puffinus bulleri</i> )                           | -23.0 (59%)      | 32.0 (81%)   | G3          | S3N           | Nonbreeding       | Species                 | Not harvested        | Yes        |
| Eastern Kingbird<br>( <i>Tyrannus tyrannus</i> )                            | -23.5 (58%)      | 32.0 (81%)   | G5          | SNA           | Transient         | Species                 | Not harvested        | Yes        |
| Rustic Bunting<br>( <i>Emberiza rustica</i> )                               | -24.0 (56%)      | 32.0 (81%)   | G5          | S3M           | Transient         | Species                 | Not harvested        | Yes        |
| Silver-haired bat<br>( <i>Lasionycteris noctivagans</i> )                   | -24.0 (56%)      | 24.0 (65%)   | G5          | S2            | Yearround         | Species                 | Not harvested        | Yes        |
| Hudsonian Godwit<br>( <i>Limosa haemastica</i> )                            | -24.0 (56%)      | 16.0 (51%)   | G4          | S2S3B         | Breeding          | Species                 | Not substantial      | No         |
| Northern Harrier<br>( <i>Circus cyaneus</i> )                               | -24.0 (56%)      | 16.0 (51%)   | G5          | S4B           | Yearround         | Genus                   | Not harvested        | No         |
| Surf Scoter<br>( <i>Melanitta perspicillata</i> )                           | -24.0 (56%)      | 8.0 (33%)    | G5          | S4B,S4N       | Yearround         | Species                 | Not substantial      | No         |
| Steller sea lion, Western U.S. stock<br>( <i>Eumatopias jubatus</i> )       | -24.0 (56%)      | -28.0 (1%)   | G3          | S2            | Yearround         | Population              | Not substantial      | No         |
| Long-toed salamander<br>( <i>Ambystoma macrodactylum</i> )                  | -24.4 (56%)      | 28.0 (77%)   | G5          | S3            | Yearround         | Species                 | Not harvested        | Yes        |
| Horned Grebe<br>( <i>Podiceps auritus</i> )                                 | -24.8 (56%)      | 6.0 (32%)    | G5          | S4S5B,<br>S4N | Yearround         | Species                 | Substantial,<br>regs | No         |

Appendix III, continued.

| Taxa   | Biological score | Action score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest              | Peripheral |
|--|------------------|--------------|-------------|------------|-------------------|-------------------------|----------------------|------------|
| Northern flying squirrel<br>( <i>Glaucomys sabrinus</i> )                      | -24.9 (56%)      | 24.0 (65%)   | G5          | S4         | Yearround         | Species                 | Not substantial      | No         |
| Black-headed Gull<br>( <i>Larus ridibundus</i> )                               | -25.0 (54%)      | 24.0 (65%)   | G5          | S3M        | Transient         | Species                 | Not harvested        | Yes        |
| King Eider<br>( <i>Somateria spectabilis</i> )                                 | -25.0 (54%)      | 4.0 (25%)    | G5          | S3B, S3N   | Yearround         | Species                 | Substantial, regs    | No         |
| Laysan Albatross<br>( <i>Phoebastria immutabilis</i> )                         | -25.0 (54%)      | 4.0 (25%)    | G3          | S3N        | Nonbreeding       | Species                 | Not substantial      | No         |
| Least Auklet<br>( <i>Aethia pusilla</i> )                                      | -25.0 (54%)      | -18.4 (5%)   | G5          | S5         | Yearround         | Species                 | Not substantial      | No         |
| St. Lawrence Island shrew<br>( <i>Sorex jacksoni</i> )                         | -25.6 (54%)      | 32.0 (81%)   | G4          | S4         | Yearround         | Species                 | Not substantial      | No         |
| Southern red-backed vole, Gapper's<br>( <i>Myodes gapperi stikinensis</i> )    | -26.0 (54%)      | 36.0 (94%)   | GNR         | S3         | Yearround         | Subspecies              | Not substantial      | No         |
| Dusky shrew, Queen Charlotte Islands<br>( <i>Sorex monticolus ellassodon</i> ) | -26.0 (54%)      | 12.0 (42%)   | GNR         | SNR        | Yearround         | Subspecies              | Not substantial      | No         |
| Alaska marmot<br>( <i>Marmota broweri</i> )                                    | -26.0 (52%)      | 32.0 (81%)   | G4          | S4         | Yearround         | Species                 | Not substantial      | No         |
| Long-tailed vole, littoralis<br>( <i>Microtus longicaudus littoralis</i> )     | -26.0 (52%)      | 26.0 (77%)   | GNR         | SNR        | Yearround         | Subspecies              | Not substantial      | No         |
| Black Turnstone<br>( <i>Arenaria melanocephala</i> )                           | -26.0 (52%)      | 4.0 (25%)    | G5          | S4B, S3N   | Yearround         | Species                 | Not substantial      | No         |
| Black-footed Albatross<br>( <i>Phoebastria nigripes</i> )                      | -26.0 (52%)      | -20.0 (4%)   | G3G4        | S3S4N      | Nonbreeding       | Species                 | Not substantial      | No         |
| Red-faced Cormorant<br>( <i>Phalacrocorax urile</i> )                          | -27.0 (52%)      | 2.0 (24%)    | G5          | S3         | Yearround         | Species                 | Substantial, regs    | No         |
| Spotted seal<br>( <i>Phoca largha</i> )  | -27.6 (51%)      | 4.0 (25%)    | G4G5        | S3S4       | Yearround         | Species                 | Substantial, no regs | No         |
| Whiskered Auklet<br>( <i>Aethia pygmaea</i> )                                  | -27.6 (51%)      | -16.0 (5%)   | G4          | S4         | Yearround         | Species                 | Substantial, regs    | No         |
| Northwestern salamander<br>( <i>Ambystoma gracile</i> )                        | -27.8 (51%)      | 32.0 (81%)   | G5          | S3         | Yearround         | Species                 | Not harvested        | Yes        |
| Red-winged Blackbird<br>( <i>Agelaius phoeniceus</i> )                         | -28.0 (50%)      | 24.0 (65%)   | G5          | S4B        | Yearround         | Species                 | Not substantial      | Yes        |

Appendix III, continued.

| <b>Taxa</b>  | <b>Biological score</b> | <b>Action score</b> | <b>Global rank</b> | <b>State rank</b> | <b>Alaska occurrence</b> | <b>Systematic significance</b> | <b>Harvest</b>    | <b>Peripheral</b> |
|--|-------------------------|---------------------|--------------------|-------------------|--------------------------|--------------------------------|-------------------|-------------------|
| Northern Pygmy-owl<br>( <i>Glaucidium gnoma</i> )                              | -28.0 (50%)             | 16.0 (51%)          | G5                 | S3                | Yearround                | Species                        | Not harvested     | Yes               |
| Northern Saw-whet Owl<br>( <i>Aegolius acadicus</i> )                          | -28.0 (50%)             | 8.0 (33%)           | G5                 | S3                | Yearround                | Species                        | Not harvested     | Yes               |
| Bald Eagle<br>( <i>Haliaeetus leucocephalus</i> )                              | -28.3 (50%)             | -28.0 (1%)          | G5                 | S5                | Yearround                | Species                        | Not harvested     | No                |
| Ermine, Kodiak Island<br>( <i>Mustela erminea kadacensis</i> )                 | -28.4 (50%)             | 8.0 (33%)           | G5T4               | S4                | Yearround                | Subspecies                     | Substantial, regs | No                |
| Northwestern deermouse, algidus<br>( <i>Peromyscus keeni algidus</i> )         | -29.5 (49%)             | 22.0 (64%)          | GNR                | SNR               | Yearround                | Subspecies                     | Not substantial   | No                |
| Crested Auklet<br>( <i>Aethia cristatella</i> )                                | -29.6 (49%)             | -16.0 (5%)          | G5                 | S5                | Yearround                | Species                        | Not substantial   | No                |
| Red squirrel, Kupreanof<br>( <i>Tamiasciurus hudsonicus picatus</i> )          | -30.0 (49%)             | 12.0 (42%)          | G5T3               | S3                | Yearround                | Subspecies                     | Not substantial   | No                |
| Northwestern deermouse, macrorhinus<br>( <i>Peromyscus keeni macrorhinus</i> ) | -30.5 (49%)             | 22.0 (64%)          | GNR                | SNR               | Yearround                | Subspecies                     | Not substantial   | No                |
| Northern sea otter, SW Alaska population<br>( <i>Enhydra lutris kenyoni</i> )  | -31.2 (48%)             | -22.0 (2%)          | G4T3               | S3                | Yearround                | Population                     | Not substantial   | No                |
| Little brown myotis<br>( <i>Myotis lucifugus</i> )                             | -31.4 (48%)             | 16.0 (51%)          | G5                 | S4                | Yearround                | Species                        | Not harvested     | No                |
| Red-eyed Vireo<br>( <i>Vireo olivaceus</i> )                                   | -31.5 (47%)             | 24.0 (65%)          | G5                 | S3B               | Breeding                 | Species                        | Not harvested     | Yes               |
| Black-backed Woodpecker<br>( <i>Picoides arcticus</i> )                        | -31.5 (47%)             | 16.0 (51%)          | G5                 | S3                | Yearround                | Species                        | Not harvested     | No                |
| Canadian lynx<br>( <i>Lynx canadensis</i> )                                    | -31.6 (47%)             | -16.0 (5%)          | G5                 | S4                | Yearround                | Species                        | Substantial, regs | No                |
| Aleutian Tern<br>( <i>Oncychoprion aleuticus</i> )                             | -31.7 (47%)             | -10.0 (9%)          | G4                 | S3B               | Breeding                 | Species                        | Not substantial   | No                |
| Upland Sandpiper<br>( <i>Bartramia longicauda</i> )                            | -32.0 (45%)             | 32.0 (81%)          | G5                 | S4B               | Breeding                 | Genus                          | Not harvested     | Yes               |
| Northern Flicker<br>( <i>Colaptes auratus</i> )                                | -32.0 (45%)             | 8.0 (33%)           | G5                 | S5B               | Breeding                 | Species                        | Not harvested     | No                |
| Arctic Tern<br>( <i>Sterna paradisaea</i> )                                    | -32.0 (45%)             | 0.0 (21%)           | G5                 | S4S5B             | Breeding                 | Species                        | Not substantial   | No                |

Appendix III, continued.

| Taxa  | Biological score | Action score | Global rank | State rank   | Alaska occurrence | Systematic significance | Harvest           | Peripheral |
|---|------------------|--------------|-------------|--------------|-------------------|-------------------------|-------------------|------------|
| Long-tailed Duck<br>( <i>Clangula hyemalis</i> )                    | -32.0 (45%)      | 0.0 (21%)    | G5          | S5B, S4N     | Yearround         | Genus                   | Substantial, regs | No         |
| Short-tailed Albatross<br>( <i>Phoebastria albatrus</i> )           | -32.0 (45%)      | -14.0 (9%)   | G1          | S1N          | Nonbreeding       | Species                 | Not substantial   | No         |
| Northern elephant seal<br>( <i>Mirounga angustirostris</i> )        | -32.2 (45%)      | 32.0 (81%)   | G5          | S4           | Transient         | Species                 | Not substantial   | No         |
| Gray-headed Chickadee<br>( <i>Poecile cincta</i> )                  | -32.4 (45%)      | 32.0 (81%)   | G5          | S3           | Yearround         | Species                 | Not harvested     | No         |
| Black-legged Kittiwake<br>( <i>Rissa tridactyla</i> )               | -32.5 (44%)      | -16.0 (5%)   | G5          | S5B, S5N     | Yearround         | Species                 | Not substantial   | No         |
| Sora<br>( <i>Porzana carolina</i> )                                 | -33.0 (44%)      | 32.0 (81%)   | G5          | S3B          | Breeding          | Species                 | Not harvested     | Yes        |
| Roughskin newt<br>( <i>Taricha granulosa</i> )                      | -33.2 (44%)      | 12.0 (42%)   | G5          | S4           | Yearround         | Species                 | Not harvested     | Yes        |
| Vaux's Swift<br>( <i>Chaetura vauxi</i> )                           | -33.6 (44%)      | 16.0 (51%)   | G5          | S2S3B        | Breeding          | Species                 | Not harvested     | Yes        |
| American Crow<br>( <i>Corvus brachyrhynchos</i> )                   | -34.0 (42%)      | 28.0 (77%)   | G5          | S3           | Breeding          | Species                 | Substantial, regs | Yes        |
| Yellow-bellied Sapsucker<br>( <i>Sphyrapicus varius</i> )           | -34.0 (42%)      | 24.0 (65%)   | G5          | SNA or S3B?? | Breeding          | Species                 | Not harvested     | Yes        |
| Collared pika<br>( <i>Ochotona collaris</i> )                       | -34.0 (42%)      | 22.0 (64%)   | G5          | S5           | Yearround         | Species                 | Not substantial   | No         |
| Gray whale, Eastern Pacific ( <i>Eschrichtius robustus</i> )        | -34.0 (42%)      | 12.0 (42%)   | G4          | S4           | Transient         | Species                 | Not substantial   | No         |
| Red Crossbill<br>( <i>Loxia curvirostra</i> )                       | -34.0 (42%)      | 8.0 (33%)    | G5          | S4           | Yearround         | Species                 | Not harvested     | Yes        |
| Three-toed Woodpecker<br>( <i>Picoides dorsalis</i> )               | -34.0 (42%)      | -4.0 (14%)   | G5          | S5           | Yearround         | Species                 | Not harvested     | No         |
| Wandering Tattler<br>( <i>Heteroscelus incanus</i> )                | -34.2 (41%)      | 24.0 (65%)   | G5          | S4S5B        | Breeding          | Species                 | Not harvested     | No         |
| Common minke whale, Alaska<br>( <i>Balaenoptera acutorostrata</i> ) | -34.8 (41%)      | 8.0 (33%)    | G5          | S4           | Transient         | Species                 | Not substantial   | No         |
| Ross's Gull<br>( <i>Rhodostethia rosea</i> )                        | -35.0 (40%)      | 32.0 (81%)   | G3G4        | S3S4M        | Transient         | Genus                   | Not harvested     | Yes        |

## Appendix III, continued.

| Taxa  | Biological score | Action score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest           | Peripheral |
|---|------------------|--------------|-------------|------------|-------------------|-------------------------|-------------------|------------|
| Swainson's Hawk<br>( <i>Buteo swainsoni</i> )                               | -35.0 (40%)      | 28.0 (77%)   | G5          | S2S3B      | Breeding          | Species                 | Not harvested     | Yes        |
| White-rumped Sandpiper<br>( <i>Calidris fuscicollis</i> )                   | -35.0 (40%)      | 16.0 (51%)   | G5          | S3B        | Breeding          | Species                 | Not harvested     | Yes        |
| Red-necked Grebe<br>( <i>Podiceps grisegena</i> )                           | -35.0 (40%)      | -4.0 (14%)   | G5          | S4S5B, S4N | Yearround         | Species                 | Not substantial   | No         |
| Arctic ground squirrel, Aleutian<br>( <i>Spermophilus parryii ablusus</i> ) | -35.9 (40%)      | 28.0 (77%)   | GNR         | SNR        | Yearround         | Subspecies              | Not substantial   | No         |
| Golden-crowned Sparrow<br>( <i>Zonotrichia atricapilla</i> )                | -36.0 (38%)      | 24.0 (65%)   | G5          | S5B        | Breeding          | Species                 | Not harvested     | No         |
| Smith's Longspur<br>( <i>Calcarius pictus</i> )                             | -36.0 (38%)      | 24.0 (65%)   | G5          | S3S4B      | Breeding          | Species                 | Not harvested     | No         |
| Great Gray Owl<br>( <i>Strix nebulosa</i> )                                 | -36.0 (38%)      | -4.0 (14%)   | G5          | S4         | Yearround         | Genus                   | Not harvested     | No         |
| Peregrine Falcon, American<br>( <i>Falco peregrinus anatum</i> )            | -36.0 (38%)      | -4.0 (14%)   | G4T3        | S3B        | Breeding          | Subspecies              | Not harvested     | No         |
| Ancient Murrelet<br>( <i>Synthliboramphus antiquus</i> )                    | -36.0 (38%)      | -22.0 (2%)   | G4          | S4         | Breeding          | Species                 | Not harvested     | No         |
| Golden Eagle<br>( <i>Aquila chrysaetos</i> )                                | -36.4 (38%)      | -16.0 (5%)   | G5          | S4B, S3N   | Yearround         | Species                 | Not substantial   | No         |
| Barred Owl<br>( <i>Strix varia</i> )  | -36.5 (38%)      | 13.6 (50%)   | G5          | S3S4       | Yearround         | Species                 | Not harvested     | Yes        |
| Bearded seal<br>( <i>Erignathus barbatus</i> )                              | -36.8 (37%)      | 16.0 (51%)   | G4G5        | S4         | Yearround         | Species                 | Substantial, regs | No         |
| Pigeon Guillemot<br>( <i>Cephus columba</i> )                               | -37.0 (37%)      | -4.0 (14%)   | G5          | S5         | Yearround         | Species                 | Not substantial   | No         |
| Northern Hawk-owl<br>( <i>Surnia ulula</i> )                                | -37.4 (37%)      | 8.0 (33%)    | G5          | S5         | Yearround         | Genus                   | Not harvested     | No         |
| Brown-headed Cowbird<br>( <i>Molothrus ater</i> )                           | -37.6 (36%)      | 24.0 (65%)   | G5          | S3B        | Breeding          | Species                 | Not harvested     | Yes        |
| Tundra shrew<br>( <i>Sorex tundrensis</i> )                                 | -38.0 (34%)      | 40.0 (97%)   | G5          | S5         | Yearround         | Species                 | Not substantial   | No         |
| Barn Swallow<br>( <i>Hirundo rustica</i> )                                  | -38.0 (34%)      | 16.0 (51%)   | G5          | S4B        | Breeding          | Species                 | Not harvested     | Yes        |

## Appendix III, continued.

| Taxa  | Biological score | Action score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest           | Peripheral |
|---|------------------|--------------|-------------|------------|-------------------|-------------------------|-------------------|------------|
| Lesser Yellowlegs<br>( <i>Tringa flavipes</i> )                             | -38.0 (34%)      | 15.2 (51%)   | G5          | S5B        | Breeding          | Species                 | Substantial, regs | No         |
| Gyr Falcon<br>( <i>Falco rusticolus</i> )                                   | -38.0 (34%)      | 8.0 (33%)    | G5          | S4         | Yearround         | Species                 | Not substantial   | No         |
| Fork-tailed Storm-Petrel, plumbea<br>( <i>Oceanodroma furcata plumbea</i> ) | -38.0 (34%)      | 4.0 (25%)    | GNR         | SNR        | Yearround         | Subspecies              | Not harvested     | No         |
| Rusty Blackbird<br>( <i>Euphagus carolinus</i> )                            | -38.0 (34%)      | 0.0 (21%)    | G4          | S4B, S3N   | Breeding          | Species                 | Not harvested     | No         |
| Chestnut-backed Chickadee<br>( <i>Poecile rufescens</i> )                   | -38.0 (34%)      | -4.0 (14%)   | G5          | S5         | Yearround         | Species                 | Not harvested     | No         |
| Common Eider, Pacific<br>( <i>Somateria mollissima</i> )                    | -38.0 (34%)      | -10.0 (9%)   | G5          | S4B, S3N   | Yearround         | Subspecies              | Substantial, regs | No         |
| Stilt Sandpiper<br>( <i>Calidris himantopus</i> )                           | -38.2 (34%)      | 22.0 (64%)   | G5          | S3B        | Breeding          | Species                 | Not harvested     | No         |
| Pied-billed Grebe<br>( <i>Podilymbus podiceps</i> )                         | -38.4 (33%)      | 30.4 (81%)   | G5          | S2S3B      | Yearround         | Species                 | Not substantial   | Yes        |
| Gray-crowned Rosy-finch<br>( <i>Leucosticte tephrocotis</i> )               | -38.4 (33%)      | 16.0 (51%)   | G5          | S5B, S3N   | Yearround         | Species                 | Not harvested     | No         |
| Common Loon<br>( <i>Gavia immer</i> )                                       | -38.4 (33%)      | 4.0 (25%)    | G5          | S5B, S4N   | Yearround         | Species                 | Substantial, regs | No         |
| Southern red-backed vole, pheaus<br>( <i>Myodes gapperi pheaus</i> )        | -38.6 (33%)      | 36.0 (94%)   | GNR         | SNR        | Yearround         | Subspecies              | Not substantial   | No         |
| Rufous Hummingbird<br>( <i>Selasphorus rufus</i> )                          | -39.0 (32%)      | -4.0 (14%)   | G5          | S4B        | Yearround         | Species                 | Not harvested     | No         |
| North American deer mouse ( <i>Peromyscus maniculatus</i> )                 | -40.0 (30%)      | 40.0 (97%)   | G5          | S4         | Yearround         | Species                 | Not substantial   | No         |
| Southern red-backed vole<br>( <i>Myodes gapperi</i> )                       | -40.0 (30%)      | 28.0 (77%)   | G5          | S4         | Yearround         | Species                 | Not substantial   | Yes        |
| Brown lemming<br>( <i>Lemmus trimucronatus</i> )                            | -40.0 (30%)      | 24.0 (65%)   | G5          | S5         | Yearround         | Species                 | Not substantial   | No         |
| American Redstart<br>( <i>Setophaga ruticilla</i> )                         | -40.0 (30%)      | 16.0 (51%)   | G5          | S3B        | Breeding          | Genus                   | Not harvested     | Yes        |
| Belted Kingfisher<br>( <i>Megasceryle alcyon</i> )                          | -40.0 (30%)      | 16.0 (51%)   | G5          | S5         | Yearround         | Species                 | Not harvested     | No         |



## Appendix III, continued.

| Taxa   | Biological score | Action score | Global rank | State rank    | Alaska occurrence | Systematic significance | Harvest                 | Peripheral |
|--|------------------|--------------|-------------|---------------|-------------------|-------------------------|-------------------------|------------|
| Snowy Owl<br>( <i>Bubo scandiacus</i> )                                  | -40.0 (30%)      | 12.0 (42%)   | G5          | S3S4          | Yearround         | Species                 | Substantial,<br>no regs | No         |
| Blackpoll Warbler<br>( <i>Dendroica striata</i> )                        | -40.0 (30%)      | 2.8 (25%)    | G5          | S4B           | Breeding          | Species                 | Not<br>harvested        | No         |
| Ringed seal<br>( <i>Pusa hispida</i> )                                   | -40.0 (30%)      | -16.0 (5%)   | G5          | S4            | Yearround         | Species                 | Substantial,<br>regs    | No         |
| Steller sea lion, Eastern U.S. stock<br>( <i>Eumatopias jubatus</i> )    | -40.0 (30%)      | -20.0 (4%)   | G3          | S3            | Yearround         | Population              | Not<br>substantial      | No         |
| Western toad<br>( <i>Bufo boreas</i> )                                   | -40.6 (29%)      | -2.0 (20%)   | G4          | S3S4          | Yearround         | Species                 | Not<br>harvested        | Yes        |
| Short-billed Dowitcher<br>( <i>Limnodromus griseus</i> )                 | -40.8 (29%)      | 24.0 (65%)   | G5          | S4S5B         | Breeding          | Species                 | Not<br>harvested        | No         |
| Rough-legged Hawk<br>( <i>Buteo lagopus</i> )                            | -41.0 (29%)      | 16.0 (51%)   | G5          | S4B           | Breeding          | Species                 | Not<br>harvested        | No         |
| White Wagtail<br>( <i>Motacilla alba</i> )                               | -42.0 (27%)      | 32.0 (81%)   | G5          | S3B           | Breeding          | Species                 | Not<br>harvested        | Yes        |
| Collared lemming<br>( <i>Dicrostonyx groenlandicus</i> )                 | -42.0 (27%)      | 28.0 (77%)   | G5          | S4            | Yearround         | Species                 | Not<br>substantial      | No         |
| White-winged Scoter<br>( <i>Melanitta fusca</i> )                        | -42.0 (27%)      | 16.0 (51%)   | G5          | S5B, S5N      | Yearround         | Species                 | Substantial,<br>regs    | No         |
| Red-breasted Nuthatch<br>( <i>Sitta canadensis</i> )                     | -42.0 (27%)      | 8.0 (33%)    | G5          | S4            | Yearround         | Species                 | Not<br>harvested        | Yes        |
| Yellow-billed Loon<br>( <i>Gavia adamsii</i> )                           | -42.0 (27%)      | -4.0 (14%)   | G4          | S2S3B,<br>S3N | Yearround         | Species                 | Not<br>substantial      | No         |
| Double-crested Cormorant<br>( <i>Phalacrocorax auritus</i> )             | -42.4 (27%)      | -2.0 (20%)   | G5          | S3            | Yearround         | Species                 | Substantial,<br>regs    | No         |
| Peregrine Falcon, Arctic<br>( <i>Falco peregrinus tundrius</i> )         | -42.4 (27%)      | -16.0 (5%)   | G4T3        | S3B           | Breeding          | Subspecies              | Not<br>harvested        | No         |
| Osprey<br>( <i>Pandion haliaetus</i> )                                   | -42.5 (26%)      | 8.0 (33%)    | G5          | S3S4B         | Breeding          | Genus                   | Not<br>harvested        | No         |
| Northern sea otter, all 3 AK stocks<br>( <i>Enhydra lutris kenyoni</i> ) | -42.8 (26%)      | -22.0 (2%)   | G4T3        | S3            | Yearround         | Species                 | Not<br>substantial      | No         |
| Leach's Storm-petrel<br>( <i>Oceanodroma leucorhoa</i> )                 | -43.6 (26%)      | -16.0 (5%)   | G5          | S5B           | Yearround         | Species                 | Not<br>harvested        | No         |

## Appendix III, continued.

| Taxa   | Biological score | Action score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest         | Peripheral |
|--|------------------|--------------|-------------|------------|-------------------|-------------------------|-----------------|------------|
| Northern Rough-winged Swallow<br>( <i>Stelgidopteryx serripennis</i> ) | -44.0 (24%)      | 28.0 (77%)   | G5          | S3B        | Breeding          | Species                 | Not harvested   | Yes        |
| Boreal Owl<br>( <i>Aegolius funereus</i> )                             | -44.0 (24%)      | 8.0 (33%)    | G5          | S4         | Yearround         | Species                 | Not harvested   | No         |
| Wilson's Warbler<br>( <i>Wilsonia pusilla</i> )                        | -44.0 (24%)      | 8.0 (33%)    | G5          | S5B        | Breeding          | Species                 | Not harvested   | No         |
| Gray-cheeked Thrush<br>( <i>Catharus minimus</i> )                     | -44.0 (24%)      | -4.0 (14%)   | G5          | S4S5B      | Breeding          | Species                 | Not harvested   | No         |
| Red-breasted Sapsucker<br>( <i>Sphyrapicus ruber</i> )                 | -44.0 (24%)      | -8.0 (11%)   | G5          | S5B        | Yearround         | Species                 | Not harvested   | No         |
| Brown Creeper<br>( <i>Certhia americana</i> )                          | -44.0 (24%)      | -10.0 (9%)   | G5          | S4         | Yearround         | Species                 | Not harvested   | Yes        |
| Buff-breasted Sandpiper<br>( <i>Tryngites subruficollis</i> )          | -44.6 (24%)      | 4.0 (25%)    | G4          | S2B        | Breeding          | Species                 | Not harvested   | No         |
| Anna's Hummingbird<br>( <i>Calypte anna</i> )                          | -45.0 (23%)      | 24.0 (65%)   | G5          | SNA        | Yearround         | Species                 | Not harvested   | Yes        |
| Western Wood-pewee<br>( <i>Contopus sordidulus</i> )                   | -45.0 (23%)      | 4.0 (25%)    | G5          | S4B        | Breeding          | Species                 | Not harvested   | Yes        |
| Hoary Redpoll<br>( <i>Carduelis hornemanni</i> )                       | -46.0 (20%)      | 32.0 (81%)   | G5          | S5         | Yearround         | Species                 | Not harvested   | No         |
| Pygmy shrew<br>( <i>Sorex hoyi</i> )                                   | -46.0 (20%)      | 32.0 (81%)   | G5          | S5         | Yearround         | Species                 | Not substantial | No         |
| Solitary Sandpiper<br>( <i>Tringa solitaria</i> )                      | -46.0 (20%)      | 16.0 (51%)   | G5          | S4B        | Breeding          | Species                 | Not harvested   | No         |
| Great Horned Owl<br>( <i>Bubo virginianus</i> )                        | -46.0 (20%)      | 12.0 (42%)   | G5          | S5         | Yearround         | Species                 | Not substantial | No         |
| Red-tailed Hawk<br>( <i>Buteo jamaicensis</i> )                        | -46.0 (20%)      | 12.0 (42%)   | G5          | S4S5B      | Breeding          | Species                 | Not substantial | No         |
| Semipalmated Sandpiper<br>( <i>Calidris pusilla</i> )                  | -46.0 (20%)      | 12.0 (42%)   | G5          | S4S5B      | Breeding          | Species                 | Not substantial | No         |
| Taiga vole (yellow-cheeked vole)<br>( <i>Microtus xanthognathus</i> )  | -46.0 (20%)      | 12.0 (42%)   | G5          | S4S5       | Yearround         | Species                 | Not substantial | No         |
| Pacific-slope Flycatcher<br>( <i>Empidonax difficilis</i> )            | -46.0 (20%)      | 8.0 (33%)    | G5          | S4B        | Breeding          | Species                 | Not harvested   | No         |

## Appendix III, continued.

| <b>Taxa</b>  | <b>Biological score</b> | <b>Action score</b> | <b>Global rank</b> | <b>State rank</b> | <b>Alaska occurrence</b> | <b>Systematic significance</b> | <b>Harvest</b>       | <b>Peripheral</b> |
|--|-------------------------|---------------------|--------------------|-------------------|--------------------------|--------------------------------|----------------------|-------------------|
| Varied Thrush<br>( <i>Ixoreus naevius</i> )  | -46.0 (20%)             | 0.0 (21%)           | G5                 | S5B               | Yearround                | Genus                          | Not harvested        | No                |
| Harbor seal<br>( <i>Phoca vitulina</i> )   | -46.0 (20%)             | -8.0 (11%)          | G5                 | S4S5              | Yearround                | Species                        | Substantial, no regs | No                |
| Golden-crowned Kinglet<br>( <i>Regulus satrapa</i> )                                   | -46.0 (20%)             | -10.0 (9%)          | G5                 | S4S5              | Yearround                | Species                        | Not harvested        | Yes               |
| Humpback whale, Central and Western North Pacific<br>( <i>Megaptera novaeangliae</i> ) | -46.0 (20%)             | -22.0 (2%)          | G3                 | S3                | Transient                | Species                        | Not harvested        | No                |
| Red-throated Loon<br>( <i>Gavia stellata</i> )   | -46.2 (19%)             | -4.0 (14%)          | G5                 | S4B, S4N          | Yearround                | Species                        | Not substantial      | No                |
| Harbor porpoise<br>( <i>Phocoena phocoena</i> )  | -46.8 (19%)             | 8.0 (33%)           | G4G5               | S4S5              | Yearround                | Species                        | Not substantial      | No                |
| Goshawk, Northern<br>( <i>Accipiter gentilis</i> )                                     | -47.0 (19%)             | 16.0 (51%)          | G5                 | S4                | Yearround                | Species                        | Not substantial      | No                |
| Northern bog lemming<br>( <i>Synaptomys borealis</i> )                                 | -47.2 (19%)             | 20.0 (61%)          | G4                 | S4S5              | Yearround                | Species                        | Not substantial      | No                |
| Water shrew<br>( <i>Sorex palustris</i> )  | -47.6 (18%)             | 32.0 (81%)          | G5                 | S4                | Yearround                | Species                        | Not substantial      | Yes               |
| Western Tanager<br>( <i>Piranga ludoviciana</i> )                                      | -48.0 (14%)             | 32.0 (81%)          | G5                 | S4B               | Breeding                 | Species                        | Not harvested        | Yes               |
| Northern Shrike<br>( <i>Lanius excubitor</i> )   | -48.0 (14%)             | 28.0 (77%)          | G5                 | S4B,S4N           | Yearround                | Species                        | Not harvested        | No                |
| Meadow jumping mouse<br>( <i>Zapus hudsonius</i> )                                     | -48.0 (14%)             | 20.0 (61%)          | G5                 | S5                | Yearround                | Species                        | Not harvested        | No                |
| Mountain Bluebird<br>( <i>Sialia currucoides</i> )                                     | -48.0 (14%)             | 18.0 (60%)          | G5                 | S3B               | Breeding                 | Species                        | Not harvested        | Yes               |
| Short-eared Owl<br>( <i>Asio flammeus</i> )  | -48.0 (14%)             | 14.4 (51%)          | G5                 | S4B               | Yearround                | Species                        | Not harvested        | No                |
| American Tree Sparrow<br>( <i>Spizella arborea</i> )                                   | -48.0 (14%)             | 12.0 (42%)          | G5                 | S5B               | Breeding                 | Species                        | Not harvested        | No                |
| Arctic Warbler<br>( <i>Phylloscopus borealis</i> )                                     | -48.0 (14%)             | 12.0 (42%)          | G5                 | S5B               | Breeding                 | Species                        | Not harvested        | Yes               |
| Olive-sided Flycatcher<br>( <i>Contopus cooperi</i> )                                  | -48.0 (14%)             | 8.0 (33%)           | G4                 | S4S5B             | Breeding                 | Species                        | Not harvested        | No                |

## Appendix III, continued.

| Taxa  | Biological score | Action score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest           | Peripheral |
|---|------------------|--------------|-------------|------------|-------------------|-------------------------|-------------------|------------|
| Townsend's Warbler<br>( <i>Dendroica townsendi</i> )      | -48.0 (14%)      | 8.0 (33%)    | G5          | S4B        | Breeding          | Species                 | Not harvested     | Yes        |
| American Dipper<br>( <i>Cinclus mexicanus</i> )           | -48.0 (14%)      | 2.0 (24%)    | G5          | S5         | Yearround         | Species                 | Not harvested     | No         |
| Black-bellied Plover<br>( <i>Pluvialis squatarola</i> )   | -48.0 (14%)      | 0.0 (21%)    | G5          | S4B        | Breeding          | Species                 | Not substantial   | No         |
| Pacific Loon<br>( <i>Gavia pacifica</i> )                 | -48.0 (14%)      | -4.0 (14%)   | G5          | S5B, S4N   | Yearround         | Species                 | Substantial, regs | No         |
| White-winged Crossbill<br>( <i>Loxia leucoptera</i> )     | -48.0 (14%)      | -4.0 (14%)   | G5          | S5         | Yearround         | Species                 | Not harvested     | No         |
| Merlin<br>( <i>Falco columbarius</i> )                    | -48.4 (14%)      | 2.0 (24%)    | G5          | S5B, S4N   | Yearround         | Species                 | Not substantial   | No         |
| Northwestern deermouse<br>( <i>Peromyscus keeni</i> )     | -48.5 (14%)      | 10.0 (41%)   | G5          | S4         | Yearround         | Species                 | Not substantial   | No         |
| Fox Sparrow<br>( <i>Passerella iliaca</i> )               | -50.0 (13%)      | 16.0 (51%)   | G5          | S5B, S3N   | Yearround         | Genus                   | Not harvested     | No         |
| Boreal Chickadee<br>( <i>Poecile hudsonica</i> )          | -50.0 (13%)      | 8.0 (33%)    | G5          | S5         | Yearround         | Species                 | Not harvested     | No         |
| Northern Waterthrush<br>( <i>Seiurus noveboracensis</i> ) | -50.0 (13%)      | 4.0 (25%)    | G5          | S4S5B      | Breeding          | Species                 | Not harvested     | No         |
| Peregrine Falcon<br>( <i>Falco peregrinus</i> )           | -50.0 (13%)      | -16.0 (5%)   | G4          | S3B, S3N   | Yearround         | Species                 | Not harvested     | No         |
| Arctic ground squirrel<br>( <i>Spermophilus parryii</i> ) | -51.2 (12%)      | 8.0 (33%)    | G5          | S5         | Yearround         | Species                 | Not substantial   | No         |
| Bluethroat<br>( <i>Luscinia svecica</i> )                 | -52.0 (10%)      | 32.0 (81%)   | G5          | S4B        | Breeding          | Species                 | Not harvested     | Yes        |
| Baird's Sandpiper<br>( <i>Calidris bairdii</i> )          | -52.0 (10%)      | 24.0 (65%)   | G5          | S4B        | Breeding          | Species                 | Not substantial   | No         |
| Townsend's Solitaire<br>( <i>Myadestes townsendi</i> )    | -52.0 (10%)      | 24.0 (65%)   | G5          | S4B        | Breeding          | Species                 | Not harvested     | Yes        |
| Whimbrel<br>( <i>Numenius phaeopus</i> )                  | -52.0 (10%)      | 16.0 (51%)   | G5          | S3S4B      | Breeding          | Species                 | Not harvested     | No         |
| Red Phalarope<br>( <i>Phalaropus fulicarius</i> )         | -52.0 (10%)      | 12.0 (42%)   | G5          | S4S5B      | Breeding          | Species                 | Not substantial   | No         |

## Appendix III, continued.

| Taxa   | Biological score | Action score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest           | Peripheral |
|--|------------------|--------------|-------------|------------|-------------------|-------------------------|-------------------|------------|
| Bank Swallow<br>( <i>Riparia riparia</i> )                                   | -52.0 (10%)      | 4.0 (25%)    | G5          | S5B        | Breeding          | Species                 | Not harvested     | No         |
| Pine Siskin<br>( <i>Carduelis pinus</i> )                                    | -52.0 (10%)      | 4.0 (25%)    | G5          | S4S5       | Yearround         | Species                 | Not harvested     | No         |
| Thick-billed Murre<br>( <i>Uria lomvia</i> )                                 | -52.0 (10%)      | -6.4 (14%)   | G5          | S4         | Yearround         | Species                 | Not substantial   | No         |
| Arctic ground squirrel, Barrow<br>( <i>Spermophilus parryii kennicotti</i> ) | -53.1 (10%)      | 20.0 (61%)   | GNR         | SNR        | Yearround         | Subspecies              | Not substantial   | No         |
| Sharp-shinned Hawk<br>( <i>Accipiter striatus</i> )                          | -53.5 (9%)       | 18.0 (60%)   | G5          | S4B,S3N    | Yearround         | Species                 | Not substantial   | No         |
| Long-tailed vole<br>( <i>Microtus longicaudus</i> )                          | -54.0 (8%)       | 20.0 (61%)   | G5          | S5         | Yearround         | Species                 | Not substantial   | Yes        |
| Violet-green Swallow<br>( <i>Tachycineta thalassina</i> )                    | -54.0 (8%)       | 16.0 (51%)   | G5          | S5B        | Breeding          | Species                 | Not harvested     | No         |
| American Golden-plover<br>( <i>Pluvialis dominica</i> )                      | -54.0 (8%)       | 12.0 (42%)   | G5          | S5B        | Breeding          | Species                 | Not harvested     | No         |
| Bohemian Waxwing<br>( <i>Bombycilla garrulus</i> )                           | -54.0 (8%)       | 4.0 (25%)    | G5          | S5B        | Yearround         | Species                 | Not harvested     | No         |
| Red-necked Phalarope<br>( <i>Phalaropus lobatus</i> )                        | -54.0 (8%)       | 4.0 (25%)    | G4G55       | S4S5B      | Breeding          | Species                 | Substantial, regs | No         |
| Dusky shrew<br>( <i>Sorex monticolus</i> )                                   | -55.3 (8%)       | 12.0 (42%)   | G5          | S5         | Yearround         | Species                 | Not substantial   | No         |
| White-crowned Sparrow<br>( <i>Zonotrichia leucophrys</i> )                   | -56.0 (6%)       | 16.0 (51%)   | G5          | S5B        | Yearround         | Species                 | Not harvested     | No         |
| Eastern Yellow Wagtail<br>( <i>Motacilla tschutschensis</i> )                | -56.0 (6%)       | 12.0 (42%)   | G5          | S5B        | Breeding          | Species                 | Not harvested     | No         |
| Singing vole<br>( <i>Microtus miurus</i> )                                   | -56.0 (6%)       | 12.0 (42%)   | G4G5        | S4S5       | Yearround         | Species                 | Not substantial   | No         |
| Pelagic Cormorant<br>( <i>Phalacrocorax pelagicus</i> )                      | -56.0 (6%)       | -2.0 (20%)   | G5          | S5         | Yearround         | Species                 | Substantial, regs | No         |
| Common Murre<br>( <i>Uria aalge</i> )  | -56.0 (6%)       | -4.0 (14%)   | G5          | S5         | Yearround         | Species                 | Not substantial   | No         |
| Glaucous Gull<br>( <i>Larus hyperboreus</i> )                                | -57.2 (6%)       | 16.0 (51%)   | G5          | S5B, S4N   | Yearround         | Species                 | Substantial, regs | No         |

## Appendix III, continued.

| Taxa  | Biological score | Action score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest           | Peripheral |
|---|------------------|--------------|-------------|------------|-------------------|-------------------------|-------------------|------------|
| Pacific Golden-plover<br>( <i>Pluvialis fulva</i> )     | -58.0 (6%)       | 4.0 (25%)    | G5          | S4B        | Breeding          | Species                 | Not harvested     | No         |
| Sharp-tailed Sandpiper<br>( <i>Calidris acuminata</i> ) | -58.2 (5%)       | 32.0 (81%)   | G5          | S4M        | Transient         | Species                 | Not substantial   | Yes        |
| Sooty Grouse<br>( <i>Dendragapus fuliginosus</i> )      | -59.0 (5%)       | 8.0 (33%)    | G5          | S5         | Yearround         | Species                 | Substantial, regs | No         |
| Hairy Woodpecker<br>( <i>Picoides villosus</i> )        | -59.5 (5%)       | -10.0 (9%)   | G5          | S5         | Yearround         | Species                 | Not harvested     | No         |
| Steller's Jay<br>( <i>Cyanocitta stelleri</i> )         | -59.6 (4%)       | 16.0 (51%)   | G5          | S5         | Yearround         | Species                 | Not harvested     | Yes        |
| Hammond's Flycatcher<br>( <i>Empidonax hammondi</i> )   | -60.0 (4%)       | 8.0 (33%)    | G5          | S4B        | Breeding          | Species                 | Not harvested     | No         |
| Swainson's Thrush<br>( <i>Catharus ustulatus</i> )      | -60.0 (4%)       | -4.0 (14%)   | G5          | S5B        | Breeding          | Species                 | Not harvested     | No         |
| Ermine<br>( <i>Mustela erminea</i> )                    | -60.4 (4%)       | -4.0 (14%)   | G5          | S5         | Yearround         | Species                 | Substantial, regs | No         |
| MacGillivray's Warbler<br>( <i>Oporornis tolmiei</i> )  | -61.6 (3%)       | 20.0 (61%)   | G5          | S4B        | Breeding          | Species                 | Not harvested     | Yes        |
| Meadow vole<br>( <i>Microtus pennsylvanicus</i> )       | -62.0 (3%)       | 12.0 (42%)   | G5          | S5         | Yearround         | Species                 | Not substantial   | No         |
| Root vole<br>( <i>Microtus oeconomus</i> )              | -64.0 (2%)       | 20.0 (61%)   | G5          | S5         | Yearround         | Species                 | Not substantial   | No         |
| Northwestern Crow<br>( <i>Corvus caurinus</i> )         | -64.0 (2%)       | 12.0 (42%)   | G5          | S5         | Yearround         | Species                 | Not harvested     | No         |
| Northern red-backed vole<br>( <i>Myodes rutilus</i> )   | -64.0 (2%)       | 4.0 (25%)    | G5          | S5         | Yearround         | Species                 | Not substantial   | No         |
| Wilson's Snipe<br>( <i>Gallinago delicata</i> )         | -65.0 (2%)       | 16.0 (51%)   | G5          | S2B, S2M   | Yearround         | Species                 | Substantial, regs | No         |
| Dark-eyed Junco<br>( <i>Junco hyemalis</i> )            | -68.0 (1%)       | 16.0 (51%)   | G5          | S5B        | Yearround         | Species                 | Not harvested     | No         |
| Pine Grosbeak<br>( <i>Pinicola enucleator</i> )         | -70.0 (1%)       | 16.0 (51%)   | G5          | S5         | Yearround         | Genus                   | Not harvested     | No         |
| Cliff Swallow<br>( <i>Petrochelidon pyrrhonota</i> )    | -70.0 (1%)       | 8.0 (33%)    | G5          | S5B        | Breeding          | Species                 | Not harvested     | No         |

Appendix III, continued.

| <b>Taxa</b>                                     | <b>Biological score</b> | <b>Action score</b> | <b>Global rank</b> | <b>State rank</b> | <b>Alaska occurrence</b> | <b>Systematic significance</b> | <b>Harvest</b> | <b>Peripheral</b> |
|---|-------------------------|---------------------|--------------------|-------------------|--------------------------|--------------------------------|----------------|-------------------|
| Hermit Thrush<br>( <i>Catharus guttatus</i> )   | -70.0 (1%)              | 4.0 (25%)           | G5                 | S5B               | Breeding                 | Species                        | Not harvested  | No                |
| Wood frog<br>( <i>Rana sylvatica</i> )          | -70.2 (0%)              | 8.0 (33%)           | G5                 | S5                | Yearround                | Species                        | Not harvested  | No                |
| American Robin<br>( <i>Turdus migratorius</i> ) | -72.0 (0%)              | -8.0 (11%)          | G5                 | S5B               | Yearround                | Species                        | Not harvested  | No                |

Appendix IV. Nominee taxa ranked (n=341) in order of descending action score. The table includes individual biological scores, action scores, global and state conservation status ranks, and supplemental variables: Alaska occurrence, systematic significance, level of harvest and peripheral status. Biological and action scores are denoted by the numerical score, followed by the percentage of taxa that ranked below them (in parentheses). Refer to Appendix V for Global and State rank definitions.

| Taxa   | Biological score | Action score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest         | Peripheral |
|--|------------------|--------------|-------------|------------|-------------------|-------------------------|-----------------|------------|
| Glacier Bay water shrew<br>( <i>Sorex alaskanus</i> )                                  | 7.0 (95%)        | 40.0 (97%)   | GH          | SH         | Yearround         | Species                 | Not substantial | No         |
| Hoary marmot, Glacier Bay<br>( <i>Marmota caligata vigilis</i> )                       | 6.0 (95%)        | 40.0 (97%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial | No         |
| Root vole, Shumagin Island<br>( <i>Microtus oeconomus popofensis</i> )                 | 2.0 (92%)        | 40.0 (97%)   | G5T2        | S2         | Yearround         | Subspecies              | Not substantial | No         |
| Insular vole, Hall Island<br>( <i>Microtus abbreviatus abbreviatus</i> )               | -4.0 (87%)       | 40.0 (97%)   | G3T3        | S3         | Yearround         | Subspecies              | Not substantial | No         |
| Arctic ground squirrel, St. Lawrence Island<br>( <i>Spermophilus parryii lyratus</i> ) | -6.4 (84%)       | 40.0 (97%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial | No         |
| Insular vole, St. Mathew Island<br>( <i>Microtus abbreviatus fisheri</i> )             | -10.0 (78%)      | 40.0 (97%)   | G3T3        | S3         | Yearround         | Subspecies              | Not substantial | No         |
| Insular vole<br>( <i>Microtus abbreviatus</i> )  | -16.0 (69%)      | 40.0 (97%)   | G3          | S3         | Yearround         | Species                 | Not substantial | No         |
| Root vole, Unalaska<br>( <i>Microtus oeconomus unalascensis</i> )                      | -18.0 (67%)      | 40.0 (97%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial | No         |
| Tundra shrew<br>( <i>Sorex tundrensis</i> )  | -38.0 (34%)      | 40.0 (97%)   | G5          | S5         | Yearround         | Species                 | Not substantial | No         |
| North American deer mouse<br>( <i>Peromyscus maniculatus</i> )                         | -40.0 (30%)      | 40.0 (97%)   | G5          | S4         | Yearround         | Species                 | Not substantial | No         |
| Arctic ground squirrel, Osgood's<br>( <i>Spermophilus parryii osgoodi</i> )            | 8.1 (96%)        | 36.0 (94%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial | No         |
| Arctic ground squirrel, Kodiak Island<br>( <i>Spermophilus parryii kodiacensis</i> )   | 2.6 (94%)        | 36.0 (94%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial | No         |
| Collared lemming, St. Lawrence Island<br>( <i>Dicrostonyx groenlandicus exsul</i> )    | 2.0 (92%)        | 36.0 (94%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial | No         |
| Collared lemming, Stevenson's<br>( <i>Dicrostonyx groenlandicus stevensoni</i> )       | -2.0 (89%)       | 36.0 (94%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial | No         |



## Appendix IV, continued.

| Taxa   | Biological score | Action Score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest           | Peripheral |
|--|------------------|--------------|-------------|------------|-------------------|-------------------------|-------------------|------------|
| Collared lemming, peninsulae<br>( <i>Dicrostonyx groenlandicus peninsulae</i> )        | -8.0 (81%)       | 36.0 (94%)   | GNR         | SNR        | Yearround         | Subspecies              | Not substantial   | No         |
| Arctic ground squirrel, Shumagin Islands<br>( <i>Spermophilus parryii nebulicola</i> ) | -11.2 (76%)      | 36.0 (94%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial   | No         |
| Southern red-backed vole, Revillagigedo Island<br>( <i>Myodes gapperi soleus</i> )     | -14.0 (71%)      | 36.0 (94%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial   | No         |
| Southern red-backed vole, Wrangell Island<br>( <i>Myodes gapperi wrangeli</i> )        | -14.0 (71%)      | 36.0 (94%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial   | No         |
| Southern red-backed vole, Gapper's<br>( <i>Myodes gapperi stikinensis</i> )            | -26.0 (54%)      | 36.0 (94%)   | GNR         | S3         | Yearround         | Subspecies              | Not substantial   | No         |
| Southern red-backed vole, pheaus<br>( <i>Myodes gapperi pheaus</i> )                   | -38.6 (33%)      | 36.0 (94%)   | GNR         | SNR        | Yearround         | Subspecies              | Not substantial   | No         |
| Ivory Gull<br>( <i>Pagophila eburnea</i> )   | -14.5 (71%)      | 34.0 (94%)   | G5          | S3N        | Nonbreeding       | Genus                   | Substantial, regs | Yes        |
| Hoary marmot, Montague Island<br>( <i>Marmota caligata sheldoni</i> )                  | 13.2 (97%)       | 32.0 (81%)   | G5T2T3      | S2S3       | Yearround         | Subspecies              | Not substantial   | No         |
| Slaty-backed Gull<br>( <i>Larus schistisagus</i> )                                     | 9.0 (96%)        | 32.0 (81%)   | G5          | S2B        | Yearround         | Species                 | Substantial, regs | Yes        |
| California myotis<br>( <i>Myotis californicus</i> )                                    | -1.6 (90%)       | 32.0 (81%)   | G3G4        | S2         | Yearround         | Species                 | Not harvested     | Yes        |
| American Coot<br>( <i>Fulica americana</i> )   | -3.0 (89%)       | 32.0 (81%)   | G5          | S2B, S2N   | Yearround         | Species                 | Not substantial   | Yes        |
| Keen's myotis<br>( <i>Myotis keenii</i> )  | -4.0 (87%)       | 32.0 (81%)   | G2G3        | S1S2       | Breeding          | Species                 | Not harvested     | No         |
| Long-tailed vole, Coronation Island<br>( <i>Microtus longicaudus coronarius</i> )      | -4.0 (87%)       | 32.0 (81%)   | G3T3        | S3         | Yearround         | Subspecies              | Not substantial   | No         |
| Gray-tailed Tattler<br>( <i>Heteroscelus brevipes</i> )                                | -5.2 (86%)       | 32.0 (81%)   | G4G5        | S3M        | Transient         | Species                 | Not harvested     | Yes        |
| Northwestern deermouse, sitkensis<br>( <i>Peromyscus keeni sitkensis</i> )             | -5.5 (86%)       | 32.0 (81%)   | GNR         | SNR        | Yearround         | Subspecies              | Not substantial   | No         |

## Appendix IV, continued.

| Taxa  | Biological score | Action Score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest         | Peripheral |
|---|------------------|--------------|-------------|------------|-------------------|-------------------------|-----------------|------------|
| Brown lemming, Nunivak Island<br>( <i>Lemmus trimucronatus harroldi</i> )             | -6.0 (84%)       | 32.0 (81%)   | G5T3T4      | S3S4       | Yearround         | Subspecies              | Not substantial | No         |
| Sanderling<br>( <i>Calidris alba</i> )  | -6.0 (84%)       | 32.0 (81%)   | G5          | S2B        | Yearround         | Species                 | Not harvested   | Yes        |
| Root vole, Sitka<br>( <i>Microtus oeconomus sitkensis</i> )                           | -8.0 (81%)       | 32.0 (81%)   | G5T2        | S2         | Yearround         | Subspecies              | Not substantial | No         |
| Root vole, St. Lawrence Island<br>( <i>Microtus oeconomus innuitus</i> )              | -8.0 (81%)       | 32.0 (81%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial | No         |
| Northwestern deer mouse, oceanicus<br>( <i>Peromyscus keeni oceanicus</i> )           | -8.5 (81%)       | 32.0 (81%)   | GNR         | SNR        | Yearround         | Subspecies              | Not substantial | No         |
| Columbia spotted frog<br>( <i>Rana luteiventris</i> )                                 | -9.0 (80%)       | 32.0 (81%)   | G4          | S2         | Yearround         | Species                 | Not harvested   | Yes        |
| Root vole, Yakutat<br>( <i>Microtus oeconomus unalascensis</i> )                      | -10.0 (78%)      | 32.0 (81%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial | No         |
| Ring-billed Gull<br>( <i>Larus delawarensis</i> )                                     | -13.0 (73%)      | 32.0 (81%)   | G5          | S3N        | Yearround         | Species                 | Not harvested   | Yes        |
| Northern red-backed vole, St. Lawrence Island<br>( <i>Myodes rutilus albiventer</i> ) | -14.0 (71%)      | 32.0 (81%)   | G5T3        | S3S4       | Yearround         | Subspecies              | Not substantial | No         |
| Stejneger's beaked whale, Alaska<br>( <i>Mesoplodon stejnegeri</i> )                  | -14.0 (71%)      | 32.0 (81%)   | G3          | S3         | Yearround         | Species                 | Not harvested   | No         |
| California Gull<br>( <i>Larus californicus</i> )                                      | -17.0 (69%)      | 32.0 (81%)   | G5          | S3N        | Yearround         | Species                 | Not harvested   | Yes        |
| Northern red-backed vole, Orca<br>( <i>Myodes rutilus orca</i> )                      | -18.0 (67%)      | 32.0 (81%)   | G5T4        | S4         | Yearround         | Subspecies              | Not substantial | No         |
| Cuvier's beaked whale, Alaska<br>( <i>Ziphius cavirostris</i> )                       | -20.0 (63%)      | 32.0 (81%)   | G4          | S3S4       | Yearround         | Species                 | Not harvested   | No         |
| Meadow vole, Admiralty<br>( <i>Microtus pennsylvanicus admiraltiae</i> )              | -20.0 (63%)      | 32.0 (81%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial | No         |
| Eurasian Dotterel<br>( <i>Charadrius morinellus</i> )                                 | -21.0 (62%)      | 32.0 (81%)   | G5          | S2B        | Breeding          | Species                 | Not harvested   | Yes        |
| Lesser Sand-Plover<br>( <i>Charadrius mongolus</i> )                                  | -21.0 (62%)      | 32.0 (81%)   | G4G5        | S3M        | Breeding          | Genus                   | Not harvested   | Yes        |

## Appendix IV, continued.

| Taxa   | Biological score | Action Score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest         | Peripheral |
|--|------------------|--------------|-------------|------------|-------------------|-------------------------|-----------------|------------|
| Alaska tiny shrew<br>( <i>Sorex yukonicus</i> )              | -22.8 (59%)      | 32.0 (81%)   | GU          | S3         | Yearround         | Species                 | Not substantial | No         |
| Buller's Shearwater<br>( <i>Puffinus bulleri</i> )           | -23.0 (59%)      | 32.0 (81%)   | G3          | S3N        | Nonbreeding       | Species                 | Not harvested   | Yes        |
| Eastern Kingbird<br>( <i>Tyrannus tyrannus</i> )             | -23.5 (58%)      | 32.0 (81%)   | G5          | SNA        | Transient         | Species                 | Not harvested   | Yes        |
| Rustic Bunting<br>( <i>Emberiza rustica</i> )                | -24.0 (56%)      | 32.0 (81%)   | G5          | S3M        | Transient         | Species                 | Not harvested   | Yes        |
| St. Lawrence Island shrew<br>( <i>Sorex jacksoni</i> )       | -25.6 (54%)      | 32.0 (81%)   | G4          | S4         | Yearround         | Species                 | Not substantial | No         |
| Alaska marmot<br>( <i>Marmota broweri</i> )                  | -26.0 (52%)      | 32.0 (81%)   | G4          | S4         | Yearround         | Species                 | Not substantial | No         |
| Northwestern salamander<br>( <i>Ambystoma gracile</i> )      | -27.8 (51%)      | 32.0 (81%)   | G5          | S3         | Yearround         | Species                 | Not harvested   | Yes        |
| Upland Sandpiper<br>( <i>Bartramia longicauda</i> )          | -32.0 (45%)      | 32.0 (81%)   | G5          | S4B        | Breeding          | Genus                   | Not harvested   | Yes        |
| Northern elephant seal<br>( <i>Mirounga angustirostris</i> ) | -32.2 (45%)      | 32.0 (81%)   | G5          | S4         | Transient         | Species                 | Not substantial | No         |
| Gray-headed Chickadee<br>( <i>Poecile cincta</i> )           | -32.4 (45%)      | 32.0 (81%)   | G5          | S3         | Yearround         | Species                 | Not harvested   | No         |
| Sora<br>( <i>Porzana carolina</i> )                          | -33.0 (44%)      | 32.0 (81%)   | G5          | S3B        | Breeding          | Species                 | Not harvested   | Yes        |
| Ross's Gull<br>( <i>Rhodostethia rosea</i> )                 | -35.0 (40%)      | 32.0 (81%)   | G3G4        | S3S4M      | Transient         | Genus                   | Not harvested   | Yes        |
| White Wagtail<br>( <i>Motacilla alba</i> )                   | -42.0 (27%)      | 32.0 (81%)   | G5          | S3B        | Breeding          | Species                 | Not harvested   | Yes        |
| Hoary Redpoll<br>( <i>Carduelis hornemanni</i> )             | -46.0 (20%)      | 32.0 (81%)   | G5          | S5         | Yearround         | Species                 | Not harvested   | No         |
| Pygmy shrew<br>( <i>Sorex hoyi</i> )                         | -46.0 (20%)      | 32.0 (81%)   | G5          | S5         | Yearround         | Species                 | Not substantial | No         |
| Water shrew<br>( <i>Sorex palustris</i> )                    | -47.6 (18%)      | 32.0 (81%)   | G5          | S4         | Yearround         | Species                 | Not substantial | Yes        |
| Western Tanager<br>( <i>Piranga ludoviciana</i> )            | -48.0 (14%)      | 32.0 (81%)   | G5          | S4B        | Breeding          | Species                 | Not harvested   | Yes        |

## Appendix IV, continued.

| Taxa  | Biological score | Action Score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest              | Peripheral |
|---|------------------|--------------|-------------|------------|-------------------|-------------------------|----------------------|------------|
| Bluethroat<br>( <i>Luscinia svecica</i> )                                   | -52.0 (10%)      | 32.0 (81%)   | G5          | S4B        | Breeding          | Species                 | Not harvested        | Yes        |
| Sharp-tailed Sandpiper<br>( <i>Calidris acuminata</i> )                     | -58.2 (5%)       | 32.0 (81%)   | G5          | S4M        | Transient         | Species                 | Not substantial      | Yes        |
| Pied-billed Grebe<br>( <i>Podilymbus podiceps</i> )                         | -38.4 (33%)      | 30.4 (81%)   | G5          | S2S3B      | Yearround         | Species                 | Not substantial      | Yes        |
| Alaskan hare, poadromus<br>( <i>Lepus othus poadromus</i> )                 | -6.0 (84%)       | 30.0 (81%)   | GNR         | SNR        | Yearround         | Subspecies              | Substantial, no regs | No         |
| Dusky shrew, Warren Island<br>( <i>Sorex monticolus malitiosus</i> )        | -4.0 (87%)       | 28.0 (77%)   | G5T3Q       | S3Q        | Yearround         | Subspecies              | Not substantial      | No         |
| Marten, Kenai<br>( <i>Martes americana kenaiensis</i> )                     | -9.0 (80%)       | 28.0 (77%)   | GNR         | S3         | Yearround         | Subspecies              | Substantial, regs    | No         |
| Long-legged myotis<br>( <i>Myotis volans</i> )                              | -11.6 (75%)      | 28.0 (77%)   | G5          | S2         | Yearround         | Species                 | Not harvested        | Yes        |
| Sky Lark<br>( <i>Alauda arvensis</i> )                                      | -19.0 (65%)      | 28.0 (77%)   | G5          | S2B        | Breeding          | Genus                   | Not harvested        | Yes        |
| Long-toed salamander<br>( <i>Ambystoma macrodactylum</i> )                  | -24.4 (56%)      | 28.0 (77%)   | G5          | S3         | Yearround         | Species                 | Not harvested        | Yes        |
| American Crow<br>( <i>Corvus brachyrhynchos</i> )                           | -34.0 (42%)      | 28.0 (77%)   | G5          | S3         | Breeding          | Species                 | Substantial, regs    | Yes        |
| Swainson's Hawk<br>( <i>Buteo swainsoni</i> )                               | -35.0 (40%)      | 28.0 (77%)   | G5          | S2S3B      | Breeding          | Species                 | Not harvested        | Yes        |
| Arctic ground squirrel, Aleutian<br>( <i>Spermophilus parryii ablusus</i> ) | -35.9 (40%)      | 28.0 (77%)   | GNR         | SNR        | Yearround         | Subspecies              | Not substantial      | No         |
| Southern red-backed vole<br>( <i>Myodes gapperi</i> )                       | -40.0 (30%)      | 28.0 (77%)   | G5          | S4         | Yearround         | Species                 | Not substantial      | Yes        |
| Collared lemming<br>( <i>Dicrostonyx groenlandicus</i> )                    | -42.0 (27%)      | 28.0 (77%)   | G5          | S4         | Yearround         | Species                 | Not substantial      | No         |
| Northern Rough-winged Swallow<br>( <i>Stelgidopteryx serripennis</i> )      | -44.0 (24%)      | 28.0 (77%)   | G5          | S3B        | Breeding          | Species                 | Not harvested        | Yes        |
| Northern Shrike<br>( <i>Lanius excubitor</i> )                              | -48.0 (14%)      | 28.0 (77%)   | G5          | S4B,S4N    | Yearround         | Species                 | Not harvested        | No         |
| Long-tailed vole, littoralis<br>( <i>Microtus longicaudus littoralis</i> )  | -26.0 (52%)      | 26.0 (77%)   | GNR         | SNR        | Yearround         | Subspecies              | Not substantial      | No         |

## Appendix IV, continued.

| Taxa   | Biological score | Action Score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest           | Peripheral |
|--|------------------|--------------|-------------|------------|-------------------|-------------------------|-------------------|------------|
| Brown lemming, black-footed<br>( <i>Lemmus trimucronatus nigripes</i> )      | 6.0 (95%)        | 24.0 (65%)   | G5T2        | S2         | Yearround         | Subspecies              | Not substantial   | No         |
| Spruce Grouse, Prince of Wales<br>( <i>Falciipennis canadensis isleibi</i> ) | 2.3 (94%)        | 24.0 (65%)   | GNR         | SNR        | Yearround         | Population              | Substantial, regs | No         |
| Ermine, Admiralty Island<br>( <i>Mustela erminea salva</i> )                 | -0.4 (91%)       | 24.0 (65%)   | G5T2T3      | S2S3       | Yearround         | Subspecies              | Substantial, regs | No         |
| River otter, Prince of Wales<br>( <i>Lontra canadensis mira</i> )            | -2.4 (89%)       | 24.0 (65%)   | G5T3        | S3         | Yearround         | Subspecies              | Substantial, regs | No         |
| Common Greenshank<br>( <i>Tringa nebularia</i> )                             | -3.0 (89%)       | 24.0 (65%)   | G5          | S2M        | Transient         | Species                 | Not harvested     | No         |
| Root vole, Penuk Island<br>( <i>Microtus oeconomus punukensis</i> )          | -3.8 (88%)       | 24.0 (65%)   | G5T2        | S2         | Yearround         | Subspecies              | Not substantial   | No         |
| Rock Sandpiper, Aleutian<br>( <i>Calidris ptilocnemis couesi</i> )           | -4.0 (87%)       | 24.0 (65%)   | GNR         | S2S3       | Yearround         | Subspecies              | Not harvested     | No         |
| Northern red-backed vole, Island<br>( <i>Myodes rutilus insularis</i> )      | -8.0 (81%)       | 24.0 (65%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial   | No         |
| Common Tern<br>( <i>Sterna hirundo</i> )                                     | -8.5 (81%)       | 24.0 (65%)   | G5          | S2M        | Transient         | Species                 | Not harvested     | Yes        |
| Arctic Loon<br>( <i>Gavia arctica</i> )                                      | -10.0 (78%)      | 24.0 (65%)   | G5          | S1S2B      | Breeding          | Species                 | Substantial, regs | Yes        |
| Dovekie<br>( <i>Alle alle</i> )  | -10.0 (78%)      | 24.0 (65%)   | G5          | S1S2B      | Yearround         | Genus                   | Not harvested     | Yes        |
| Northern red-backed vole, Glacier Bay<br>( <i>Myodes rutilus glacialis</i> ) | -10.0 (78%)      | 24.0 (65%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial   | No         |
| Red squirrel, Kenai<br>( <i>Tamiasciurus hudsonicus kenaiensis</i> )         | -10.0 (78%)      | 24.0 (65%)   | G5T3?       | SNR        | Yearround         | Subspecies              | Not substantial   | No         |
| Rock Sandpiper, Bering Sea<br>( <i>Calidris ptilocnemis tschuktschorum</i> ) | -12.0 (74%)      | 24.0 (65%)   | GNR         | S2N, S3B   | Yearround         | Subspecies              | Not harvested     | No         |
| Dusky shrew, Yakutat<br>( <i>Sorex monticolus alascensis</i> )               | -14.0 (71%)      | 24.0 (65%)   | GNR         | SNR        | Yearround         | Subspecies              | Not substantial   | No         |
| Black Swift<br>( <i>Cypseloides niger</i> )                                  | -16.4 (69%)      | 24.0 (65%)   | G4          | S2N        | Yearround         | Genus                   | Not harvested     | Yes        |

## Appendix IV, continued.

| Taxa   | Biological score | Action Score | Global rank | State rank   | Alaska occurrence | Systematic significance | Harvest         | Peripheral |
|--|------------------|--------------|-------------|--------------|-------------------|-------------------------|-----------------|------------|
| Ruff<br>( <i>Philomachus pugnax</i> )                        | -17.0 (69%)      | 24.0 (65%)   | G5          | S2M          | Transient         | Genus                   | Not harvested   | Yes        |
| Brambling<br>( <i>Fringilla montifringilla</i> )             | -18.0 (67%)      | 24.0 (65%)   | G5          | S3N          | Breeding          | Species                 | Not harvested   | Yes        |
| Long-toed Stint<br>( <i>Calidris subminuta</i> )             | -19.0 (65%)      | 24.0 (65%)   | G4G5        | S3M          | Transient         | Species                 | Not harvested   | Yes        |
| Common Sandpiper<br>( <i>Actitis hypoleucos</i> )            | -20.0 (63%)      | 24.0 (65%)   | G5          | S2M          | Transient         | Species                 | Not harvested   | Yes        |
| Siberian Rubythroat<br>( <i>Luscinia calliope</i> )          | -20.0 (63%)      | 24.0 (65%)   | G5          | S2M          | Transient         | Species                 | Not harvested   | Yes        |
| American Bittern<br>( <i>Botaurus lentiginosus</i> )         | -21.8 (61%)      | 24.0 (65%)   | G4          | S3B          | Breeding          | Species                 | Not substantial | Yes        |
| Band-tailed Pigeon<br>( <i>Patagioenas fasciata</i> )        | -22.0 (59%)      | 24.0 (65%)   | G5          | S3B          | Breeding          | Species                 | Not harvested   | Yes        |
| Silver-haired bat<br>( <i>Lasiorycteris noctivagans</i> )    | -24.0 (56%)      | 24.0 (65%)   | G5          | S2           | Yearround         | Species                 | Not harvested   | Yes        |
| Northern flying squirrel<br>( <i>Glaucomys sabrinus</i> )    | -24.9 (56%)      | 24.0 (65%)   | G5          | S4           | Yearround         | Species                 | Not substantial | No         |
| Black-headed Gull<br>( <i>Larus ridibundus</i> )             | -25.0 (54%)      | 24.0 (65%)   | G5          | S3M          | Transient         | Species                 | Not harvested   | Yes        |
| Red-winged Blackbird<br>( <i>Agelaius phoeniceus</i> )       | -28.0 (50%)      | 24.0 (65%)   | G5          | S4B          | Yearround         | Species                 | Not substantial | Yes        |
| Red-eyed Vireo<br>( <i>Vireo olivaceus</i> )                 | -31.5 (47%)      | 24.0 (65%)   | G5          | S3B          | Breeding          | Species                 | Not harvested   | Yes        |
| Yellow-bellied Sapsucker<br>( <i>Sphyrapicus varius</i> )    | -34.0 (42%)      | 24.0 (65%)   | G5          | SNA or S3B?? | Breeding          | Species                 | Not harvested   | Yes        |
| Wandering Tattler<br>( <i>Heteroscelus incanus</i> )         | -34.2 (41%)      | 24.0 (65%)   | G5          | S4S5B        | Breeding          | Species                 | Not harvested   | No         |
| Golden-crowned Sparrow<br>( <i>Zonotrichia atricapilla</i> ) | -36.0 (38%)      | 24.0 (65%)   | G5          | S5B          | Breeding          | Species                 | Not harvested   | No         |
| Smith's Longspur<br>( <i>Calcarius pictus</i> )              | -36.0 (38%)      | 24.0 (65%)   | G5          | S3S4B        | Breeding          | Species                 | Not harvested   | No         |
| Brown-headed Cowbird<br>( <i>Molothrus ater</i> )            | -37.6 (36%)      | 24.0 (65%)   | G5          | S3B          | Breeding          | Species                 | Not harvested   | Yes        |

## Appendix IV, continued.

| Taxa   | Biological score | Action Score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest         | Peripheral |
|--|------------------|--------------|-------------|------------|-------------------|-------------------------|-----------------|------------|
| Brown lemming<br>( <i>Lemmus trimucronatus</i> )                               | -40.0 (30%)      | 24.0 (65%)   | G5          | S5         | Yearround         | Species                 | Not substantial | No         |
| Short-billed Dowitcher<br>( <i>Limnodromus griseus</i> )                       | -40.8 (29%)      | 24.0 (65%)   | G5          | S4S5B      | Breeding          | Species                 | Not harvested   | No         |
| Anna's Hummingbird<br>( <i>Calypte anna</i> )                                  | -45.0 (23%)      | 24.0 (65%)   | G5          | SNA        | Yearround         | Species                 | Not harvested   | Yes        |
| Baird's Sandpiper<br>( <i>Calidris bairdii</i> )                               | -52.0 (10%)      | 24.0 (65%)   | G5          | S4B        | Breeding          | Species                 | Not substantial | No         |
| Townsend's Solitaire<br>( <i>Myadestes townsendi</i> )                         | -52.0 (10%)      | 24.0 (65%)   | G5          | S4B        | Breeding          | Species                 | Not harvested   | Yes        |
| Northwestern deermouse, hylaeus<br>( <i>Peromyscus keeni hylaeus</i> )         | -20.5 (63%)      | 22.0 (64%)   | GNR         | SNR        | Yearround         | Subspecies              | Not substantial | No         |
| Northwestern deermouse, algidus<br>( <i>Peromyscus keeni algidus</i> )         | -29.5 (49%)      | 22.0 (64%)   | GNR         | SNR        | Yearround         | Subspecies              | Not substantial | No         |
| Northwestern deermouse, macrorhinus<br>( <i>Peromyscus keeni macrorhinus</i> ) | -30.5 (49%)      | 22.0 (64%)   | GNR         | SNR        | Yearround         | Subspecies              | Not substantial | No         |
| Collared pika<br>( <i>Ochotona collaris</i> )                                  | -34.0 (42%)      | 22.0 (64%)   | G5          | S5         | Yearround         | Species                 | Not substantial | No         |
| Stilt Sandpiper<br>( <i>Calidris himantopus</i> )                              | -38.2 (34%)      | 22.0 (64%)   | G5          | S3B        | Breeding          | Species                 | Not harvested   | No         |
| Root vole, Montague Island<br>( <i>Microtus oeconomus elymocetes</i> )         | -1.6 (91%)       | 20.0 (61%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial | No         |
| Killdeer<br>( <i>Charadrius vociferus</i> )                                    | -18.0 (67%)      | 20.0 (61%)   | G5          | S3S4B      | Yearround         | Species                 | Not harvested   | Yes        |
| Northern bog lemming<br>( <i>Synaptomys borealis</i> )                         | -47.2 (19%)      | 20.0 (61%)   | G4          | S4S5       | Yearround         | Species                 | Not substantial | No         |
| Meadow jumping mouse<br>( <i>Zapus hudsonius</i> )                             | -48.0 (14%)      | 20.0 (61%)   | G5          | S5         | Yearround         | Species                 | Not harvested   | No         |
| Arctic ground squirrel, Barrow<br>( <i>Spermophilus parryii kennicotti</i> )   | -53.1 (10%)      | 20.0 (61%)   | GNR         | SNR        | Yearround         | Subspecies              | Not substantial | No         |
| Long-tailed vole<br>( <i>Microtus longicaudus</i> )                            | -54.0 (8%)       | 20.0 (61%)   | G5          | S5         | Yearround         | Species                 | Not substantial | Yes        |
| MacGillivray's Warbler<br>( <i>Oporornis tolmiei</i> )                         | -61.6 (3%)       | 20.0 (61%)   | G5          | S4B        | Breeding          | Species                 | Not harvested   | Yes        |

## Appendix IV, continued.

| Taxa  | Biological score | Action Score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest           | Peripheral |
|---|------------------|--------------|-------------|------------|-------------------|-------------------------|-------------------|------------|
| Root vole<br>( <i>Microtus oeconomus</i> )                        | -64.0 (2%)       | 20.0 (61%)   | G5          | S5         | Yearround         | Species                 | Not substantial   | No         |
| Dunlin, Pacific<br>( <i>Calidris alpina pacifica</i> )            | -22.0 (59%)      | 18.4 (61%)   | GNR         | SNR        | Yearround         | Subspecies              | Not substantial   | No         |
| Eskimo Curlew<br>( <i>Numenius borealis</i> )                     | 27.0 (100%)      | 18.0 (60%)   | G1          | SH         | Breeding          | Species                 | Not harvested     | No         |
| Black Guillemot<br>( <i>Cephus grylle</i> )                       | -6.0 (84%)       | 18.0 (60%)   | G5          | S2         | Yearround         | Species                 | Not substantial   | Yes        |
| Winter Wren, Kodiak<br>( <i>Troglodytes troglodytes helleri</i> ) | -22.0 (59%)      | 18.0 (60%)   | G5T3        | S3         | Yearround         | Subspecies              | Not harvested     | No         |
| Mountain Bluebird<br>( <i>Sialia currucoides</i> )                | -48.0 (14%)      | 18.0 (60%)   | G5          | S3B        | Breeding          | Species                 | Not harvested     | Yes        |
| Sharp-shinned Hawk<br>( <i>Accipiter striatus</i> )               | -53.5 (9%)       | 18.0 (60%)   | G5          | S4B,S3N    | Yearround         | Species                 | Not substantial   | No         |
| Ermine, Suemez Island<br>( <i>Mustela erminea seclusa</i> )       | -6.4 (84%)       | 16.0 (51%)   | G5T3        | S3         | Yearround         | Subspecies              | Substantial, regs | No         |
| Surfbird<br>( <i>Aphriza virgata</i> )                            | -10.0 (78%)      | 16.0 (51%)   | G5          | S2N, S3B   | Yearround         | Genus                   | Not harvested     | No         |
| Ermine, Baranof<br>( <i>Mustela erminea initis</i> )              | -10.4 (77%)      | 16.0 (51%)   | G5T3        | S3         | Yearround         | Subspecies              | Substantial, regs | No         |
| Hudsonian Godwit<br>( <i>Limosa haemastica</i> )                  | -24.0 (56%)      | 16.0 (51%)   | G4          | S2S3B      | Breeding          | Species                 | Not substantial   | No         |
| Northern Harrier<br>( <i>Circus cyaneus</i> )                     | -24.0 (56%)      | 16.0 (51%)   | G5          | S4B        | Yearround         | Genus                   | Not harvested     | No         |
| Northern Pygmy-owl<br>( <i>Glaucidium gnoma</i> )                 | -28.0 (50%)      | 16.0 (51%)   | G5          | S3         | Yearround         | Species                 | Not harvested     | Yes        |
| Little brown myotis<br>( <i>Myotis lucifugus</i> )                | -31.4 (48%)      | 16.0 (51%)   | G5          | S4         | Yearround         | Species                 | Not harvested     | No         |
| Black-backed Woodpecker<br>( <i>Picoides arcticus</i> )           | -31.5 (47%)      | 16.0 (51%)   | G5          | S3         | Yearround         | Species                 | Not harvested     | No         |
| Vaux's Swift<br>( <i>Chaetura vauxi</i> )                         | -33.6 (44%)      | 16.0 (51%)   | G5          | S2S3B      | Breeding          | Species                 | Not harvested     | Yes        |
| White-rumped Sandpiper<br>( <i>Calidris fuscicollis</i> )         | -35.0 (40%)      | 16.0 (51%)   | G5          | S3B        | Breeding          | Species                 | Not harvested     | Yes        |



## Appendix IV, continued.

| Taxa  | Biological score | Action Score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest           | Peripheral |
|---|------------------|--------------|-------------|------------|-------------------|-------------------------|-------------------|------------|
| Bearded seal<br>( <i>Erignathus barbatus</i> )                | -36.8 (37%)      | 16.0 (51%)   | G4G5        | S4         | Yearround         | Species                 | Substantial, regs | No         |
| Barn Swallow<br>( <i>Hirundo rustica</i> )                    | -38.0 (34%)      | 16.0 (51%)   | G5          | S4B        | Breeding          | Species                 | Not harvested     | Yes        |
| Gray-crowned Rosy-finch<br>( <i>Leucosticte tephrocotis</i> ) | -38.4 (33%)      | 16.0 (51%)   | G5          | S3N,S5B    | Yearround         | Species                 | Not harvested     | No         |
| American Redstart<br>( <i>Setophaga ruticilla</i> )           | -40.0 (30%)      | 16.0 (51%)   | G5          | S3B        | Breeding          | Genus                   | Not harvested     | Yes        |
| Belted Kingfisher<br>( <i>Megaceryle alcyon</i> )             | -40.0 (30%)      | 16.0 (51%)   | G5          | S5         | Yearround         | Species                 | Not harvested     | No         |
| Rough-legged Hawk<br>( <i>Buteo lagopus</i> )                 | -41.0 (29%)      | 16.0 (51%)   | G5          | S4B        | Breeding          | Species                 | Not harvested     | No         |
| White-winged Scoter<br>( <i>Melanitta fusca</i> )             | -42.0 (27%)      | 16.0 (51%)   | G5          | S5B, S5N   | Yearround         | Species                 | Substantial, regs | No         |
| Solitary Sandpiper<br>( <i>Tringa solitaria</i> )             | -46.0 (20%)      | 16.0 (51%)   | G5          | S4B        | Breeding          | Species                 | Not harvested     | No         |
| Goshawk, Northern<br>( <i>Accipiter gentilis</i> )            | -47.0 (19%)      | 16.0 (51%)   | G5          | S4         | Yearround         | Species                 | Not substantial   | No         |
| Fox Sparrow<br>( <i>Passerella iliaca</i> )                   | -50.0 (13%)      | 16.0 (51%)   | G5          | S5B, S3N   | Yearround         | Genus                   | Not harvested     | No         |
| Whimbrel<br>( <i>Numenius phaeopus</i> )                      | -52.0 (10%)      | 16.0 (51%)   | G5          | S3S4B      | Breeding          | Species                 | Not harvested     | No         |
| Violet-green Swallow<br>( <i>Tachycineta thalassina</i> )     | -54.0 (8%)       | 16.0 (51%)   | G5          | S5B        | Breeding          | Species                 | Not harvested     | No         |
| White-crowned Sparrow<br>( <i>Zonotrichia leucophrys</i> )    | -56.0 (6%)       | 16.0 (51%)   | G5          | S5B        | Yearround         | Species                 | Not harvested     | No         |
| Glaucous Gull<br>( <i>Larus hyperboreus</i> )                 | -57.2 (6%)       | 16.0 (51%)   | G5          | S5B, S4N   | Yearround         | Species                 | Substantial, regs | No         |
| Steller's Jay<br>( <i>Cyanocitta stelleri</i> )               | -59.6 (4%)       | 16.0 (51%)   | G5          | S5         | Yearround         | Species                 | Not harvested     | Yes        |
| Wilson's Snipe<br>( <i>Gallinago delicata</i> )               | -65.0 (2%)       | 16.0 (51%)   | G5          | S2B, S2M   | Yearround         | Species                 | Substantial, regs | No         |
| Dark-eyed Junco<br>( <i>Junco hyemalis</i> )                  | -68.0 (1%)       | 16.0 (51%)   | G5          | S5B        | Yearround         | Species                 | Not harvested     | No         |

## Appendix IV, continued.

| Taxa   | Biological score | Action Score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest              | Peripheral |
|--|------------------|--------------|-------------|------------|-------------------|-------------------------|----------------------|------------|
| Pine Grosbeak<br>( <i>Pinicola enucleator</i> )                                | -70.0 (1%)       | 16.0 (51%)   | G5          | S5         | Yearround         | Genus                   | Not harvested        | No         |
| Lesser Yellowlegs<br>( <i>Tringa flavipes</i> )                                | -38.0 (34%)      | 15.2 (51%)   | G5          | S5B        | Breeding          | Species                 | Substantial, regs    | No         |
| Tennessee Warbler<br>( <i>Vermivora peregrina</i> )                            | -22.0 (59%)      | 14.4 (51%)   | G5          | S2S3B      | Breeding          | Species                 | Not harvested        | Yes        |
| Short-eared Owl<br>( <i>Asio flammeus</i> )                                    | -48.0 (14%)      | 14.4 (51%)   | G5          | S4B        | Yearround         | Species                 | Not harvested        | No         |
| Alaskan hare<br>( <i>Lepus othus</i> )   | -11.4 (76%)      | 14.0 (50%)   | G3G4        | S3S4       | Yearround         | Species                 | Substantial, no regs | No         |
| Barred Owl<br>( <i>Strix varia</i> )   | -36.5 (38%)      | 13.6 (50%)   | G5          | S3S4       | Yearround         | Species                 | Not harvested        | Yes        |
| Beaver, Admiralty<br>( <i>Castor canadensis phaeus</i> )                       | 1.0 (92%)        | 12.0 (42%)   | G5T3        | S3         | Yearround         | Subspecies              | Not harvested        | No         |
| Sei whale, North Pacific<br>( <i>Balaenoptera borealis</i> )                   | -5.4 (86%)       | 12.0 (42%)   | G3          | S3         | Transient         | Species                 | Not harvested        | No         |
| Marbled Godwit<br>( <i>Limosa fedoa</i> )                                      | -8.0 (81%)       | 12.0 (42%)   | G5          | S2B        | Breeding          | Species                 | Not substantial      | No         |
| Wolf, Alexander Archipelago<br>( <i>Canis lupus ligoni</i> )                   | -10.8 (76%)      | 12.0 (42%)   | G4T3        | S3         | Yearround         | Population              | Substantial, regs    | No         |
| Marbled Murrelet<br>( <i>Brachyramphus marmoratus</i> )                        | -11.2 (76%)      | 12.0 (42%)   | G3G4        | S3         | Yearround         | Species                 | Not substantial      | No         |
| Baird's beaked whale, Alaska<br>( <i>Berardius bairdii</i> )                   | -14.0 (71%)      | 12.0 (42%)   | G4          | S4         | Transient         | Species                 | Not harvested        | No         |
| Pribilof Island shrew<br>( <i>Sorex pribilofensis</i> )                        | -14.0 (71%)      | 12.0 (42%)   | G3          | S3         | Yearround         | Species                 | Not substantial      | No         |
| Great Blue Heron, Pacific<br>( <i>Ardea herodias</i> )                         | -15.6 (70%)      | 12.0 (42%)   | G5          | S2S3       | Yearround         | Subspecies              | Not harvested        | No         |
| Red Knot<br>( <i>Calidris canutus</i> )  | -16.0 (69%)      | 12.0 (42%)   | G5          | S2S3B      | Breeding          | Species                 | Not harvested        | Yes        |
| Dusky shrew, Queen Charlotte Islands<br>( <i>Sorex monticolus ellassodon</i> ) | -26.0 (54%)      | 12.0 (42%)   | GNR         | SNR        | Yearround         | Subspecies              | Not substantial      | No         |
| Red squirrel, Kupreanof<br>( <i>Tamiasciurus hudsonicus picatus</i> )          | -30.0 (49%)      | 12.0 (42%)   | G5T3        | S3         | Yearround         | Subspecies              | Not substantial      | No         |

## Appendix IV, continued.

| <b>Taxa</b>   | <b>Biological score</b> | <b>Action Score</b> | <b>Global rank</b> | <b>State rank</b> | <b>Alaska occurrence</b> | <b>Systematic significance</b> | <b>Harvest</b>       | <b>Peripheral</b> |
|---|-------------------------|---------------------|--------------------|-------------------|--------------------------|--------------------------------|----------------------|-------------------|
| Roughskin newt<br>( <i>Taricha granulosa</i> )                        | -33.2 (44%)             | 12.0 (42%)          | G5                 | S4                | Yearround                | Species                        | Not harvested        | Yes               |
| Gray whale, Eastern Pacific<br>( <i>Eschrichtius robustus</i> )       | -34.0 (42%)             | 12.0 (42%)          | G4                 | S4                | Transient                | Species                        | Not substantial      | No                |
| Snowy Owl<br>( <i>Bubo scandiacus</i> )                               | -40.0 (30%)             | 12.0 (42%)          | G5                 | S3S4              | Yearround                | Species                        | Substantial, no regs | No                |
| Great Horned Owl<br>( <i>Bubo virginianus</i> )                       | -46.0 (20%)             | 12.0 (42%)          | G5                 | S5                | Yearround                | Species                        | Not substantial      | No                |
| Red-tailed Hawk<br>( <i>Buteo jamaicensis</i> )                       | -46.0 (20%)             | 12.0 (42%)          | G5                 | S4S5B             | Breeding                 | Species                        | Not substantial      | No                |
| Semipalmated Sandpiper<br>( <i>Calidris pusilla</i> )                 | -46.0 (20%)             | 12.0 (42%)          | G5                 | S4S5B             | Breeding                 | Species                        | Not substantial      | No                |
| Taiga vole (yellow-cheeked vole)<br>( <i>Microtus xanthognathus</i> ) | -46.0 (20%)             | 12.0 (42%)          | G5                 | S4S5              | Yearround                | Species                        | Not substantial      | No                |
| American Tree Sparrow<br>( <i>Spizella arborea</i> )                  | -48.0 (14%)             | 12.0 (42%)          | G5                 | S5B               | Breeding                 | Species                        | Not harvested        | No                |
| Arctic Warbler<br>( <i>Phylloscopus borealis</i> )                    | -48.0 (14%)             | 12.0 (42%)          | G5                 | S5B               | Breeding                 | Species                        | Not harvested        | Yes               |
| Red Phalarope<br>( <i>Phalaropus fulicarius</i> )                     | -52.0 (10%)             | 12.0 (42%)          | G5                 | S4S5B             | Breeding                 | Species                        | Not substantial      | No                |
| American Golden-plover<br>( <i>Pluvialis dominica</i> )               | -54.0 (8%)              | 12.0 (42%)          | G5                 | S5B               | Breeding                 | Species                        | Not harvested        | No                |
| Dusky shrew<br>( <i>Sorex monticolus</i> )                            | -55.3 (8%)              | 12.0 (42%)          | G5                 | S5                | Yearround                | Species                        | Not substantial      | No                |
| Eastern Yellow Wagtail<br>( <i>Motacilla tschutschensis</i> )         | -56.0 (6%)              | 12.0 (42%)          | G5                 | S5B               | Breeding                 | Species                        | Not harvested        | No                |
| Singing vole<br>( <i>Microtus miurus</i> )                            | -56.0 (6%)              | 12.0 (42%)          | G4G5               | S4S5              | Yearround                | Species                        | Not substantial      | No                |
| Meadow vole<br>( <i>Microtus pennsylvanicus</i> )                     | -62.0 (3%)              | 12.0 (42%)          | G5                 | S5                | Yearround                | Species                        | Not substantial      | No                |
| Northwestern Crow<br>( <i>Corvus caurinus</i> )                       | -64.0 (2%)              | 12.0 (42%)          | G5                 | S5                | Yearround                | Species                        | Not harvested        | No                |
| Kittlitz's Murrelet<br>( <i>Brachyramphus brevirostris</i> )          | 0.8 (92%)               | 10.4 (42%)          | G2                 | S2B,S2N           | Yearround                | Species                        | Not substantial      | No                |

## Appendix IV, continued.

| Taxa  | Biological score | Action Score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest           | Peripheral |
|---|------------------|--------------|-------------|------------|-------------------|-------------------------|-------------------|------------|
| Winter Wren, Pribilof<br>( <i>Troglodytes troglodytes alascensis</i> )  | 0.0 (91%)        | 10.0 (41%)   | G5T2        | S2         | Yearround         | Subspecies              | Not harvested     | No         |
| Merlin, Black<br>( <i>Falco columbarius suckleyi</i> )                  | -12.2 (74%)      | 10.0 (41%)   | G4T4        | S3         | Yearround         | Subspecies              | Not substantial   | No         |
| Northwestern deermouse<br>( <i>Peromyscus keeni</i> )                   | -48.5 (14%)      | 10.0 (41%)   | G5          | S4         | Yearround         | Species                 | Not substantial   | No         |
| Winter Wren, Kiska<br>( <i>Troglodytes troglodytes kiskensis</i> )      | -14.0 (71%)      | 8.8 (40%)    | G5T2T3      | S2S3       | Yearround         | Subspecies              | Not harvested     | No         |
| Winter Wren, Attu<br>( <i>Troglodytes troglodytes meligerus</i> )       | -16.0 (69%)      | 8.8 (40%)    | G5T3        | S3         | Yearround         | Subspecies              | Not harvested     | No         |
| Rock Sandpiper, Pribilof<br>( <i>Calidris ptilocnemis ptilocnemis</i> ) | 4.0 (94%)        | 8.0 (33%)    | G5T3        | S2N, S3B   | Yearround         | Subspecies              | Not harvested     | No         |
| Ermine, Prince of Wales<br>( <i>Mustela erminea celenda</i> )           | -10.4 (77%)      | 8.0 (33%)    | G5T3        | S3         | Yearround         | Subspecies              | Substantial, regs | No         |
| Peregrine Falcon, Peale's<br>( <i>Falco peregrinus pealei</i> )         | -12.0 (74%)      | 8.0 (33%)    | G4T2T3      | S2S3       | Yearround         | Subspecies              | Not substantial   | No         |
| Western Screech-Owl<br>( <i>Otus kennicottii</i> )                      | -17.4 (68%)      | 8.0 (33%)    | G5          | S2         | Yearround         | Species                 | Not harvested     | Yes        |
| Surf Scoter<br>( <i>Melanitta perspicillata</i> )                       | -24.0 (56%)      | 8.0 (33%)    | G5          | S4B,S4N    | Yearround         | Species                 | Not substantial   | No         |
| Northern Saw-whet Owl<br>( <i>Aegolius acadicus</i> )                   | -28.0 (50%)      | 8.0 (33%)    | G5          | S3         | Yearround         | Species                 | Not harvested     | Yes        |
| Ermine, Kodiak Island<br>( <i>Mustela erminea kadacensis</i> )          | -28.4 (50%)      | 8.0 (33%)    | G5T4        | S4         | Yearround         | Subspecies              | Substantial, regs | No         |
| Northern Flicker<br>( <i>Colaptes auratus</i> )                         | -32.0 (45%)      | 8.0 (33%)    | G5          | S5B        | Breeding          | Species                 | Not harvested     | No         |
| Red Crossbill<br>( <i>Loxia curvirostra</i> )                           | -34.0 (42%)      | 8.0 (33%)    | G5          | S4         | Yearround         | Species                 | Not harvested     | Yes        |
| Common minke whale, Alaska<br>( <i>Balaenoptera acutorostrata</i> )     | -34.8 (41%)      | 8.0 (33%)    | G5          | S4         | Transient         | Species                 | Not substantial   | No         |
| Northern Hawk-owl<br>( <i>Surnia ulula</i> )                            | -37.4 (37%)      | 8.0 (33%)    | G5          | S5         | Yearround         | Genus                   | Not harvested     | No         |
| Gyrfalcon<br>( <i>Falco rusticolus</i> )                                | -38.0 (34%)      | 8.0 (33%)    | G5          | S4         | Yearround         | Species                 | Not substantial   | No         |

## Appendix IV, continued.

| Taxa  | Biological score | Action Score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest           | Peripheral |
|---|------------------|--------------|-------------|------------|-------------------|-------------------------|-------------------|------------|
| Red-breasted Nuthatch<br>( <i>Sitta canadensis</i> )        | -42.0 (27%)      | 8.0 (33%)    | G5          | S4         | Yearround         | Species                 | Not harvested     | Yes        |
| Osprey<br>( <i>Pandion haliaetus</i> )                      | -42.5 (26%)      | 8.0 (33%)    | G5          | S3S4B      | Breeding          | Genus                   | Not harvested     | No         |
| Boreal Owl<br>( <i>Aegolius funereus</i> )                  | -44.0 (24%)      | 8.0 (33%)    | G5          | S4         | Yearround         | Species                 | Not harvested     | No         |
| Wilson's Warbler<br>( <i>Wilsonia pusilla</i> )             | -44.0 (24%)      | 8.0 (33%)    | G5          | S5B        | Breeding          | Species                 | Not harvested     | No         |
| Pacific-slope Flycatcher<br>( <i>Empidonax difficilis</i> ) | -46.0 (20%)      | 8.0 (33%)    | G5          | S4B        | Breeding          | Species                 | Not harvested     | No         |
| Harbor porpoise<br>( <i>Phocoena phocoena</i> )             | -46.8 (19%)      | 8.0 (33%)    | G4G5        | S4S5       | Yearround         | Species                 | Not substantial   | No         |
| Olive-sided Flycatcher<br>( <i>Contopus cooperi</i> )       | -48.0 (14%)      | 8.0 (33%)    | G4          | S4S5B      | Breeding          | Species                 | Not harvested     | No         |
| Townsend's Warbler<br>( <i>Dendroica townsendi</i> )        | -48.0 (14%)      | 8.0 (33%)    | G5          | S4B        | Breeding          | Species                 | Not harvested     | Yes        |
| Boreal Chickadee<br>( <i>Poecile hudsonica</i> )            | -50.0 (13%)      | 8.0 (33%)    | G5          | S5         | Yearround         | Species                 | Not harvested     | No         |
| Arctic ground squirrel<br>( <i>Spermophilus parryii</i> )   | -51.2 (12%)      | 8.0 (33%)    | G5          | S5         | Yearround         | Species                 | Not substantial   | No         |
| Sooty Grouse<br>( <i>Dendragapus fuliginosus</i> )          | -59.0 (5%)       | 8.0 (33%)    | G5          | S5         | Yearround         | Species                 | Substantial, regs | No         |
| Hammond's Flycatcher<br>( <i>Empidonax hammondii</i> )      | -60.0 (4%)       | 8.0 (33%)    | G5          | S4B        | Breeding          | Species                 | Not harvested     | No         |
| Cliff Swallow<br>( <i>Petrochelidon pyrrhonota</i> )        | -70.0 (1%)       | 8.0 (33%)    | G5          | S5B        | Breeding          | Species                 | Not harvested     | No         |
| Wood frog<br>( <i>Rana sylvatica</i> )                      | -70.2 (0%)       | 8.0 (33%)    | G5          | S5         | Yearround         | Species                 | Not harvested     | No         |
| Horned Grebe<br>( <i>Podiceps auritus</i> )                 | -24.8 (56%)      | 6.0 (32%)    | G5          | S4S5B, S4N | Yearround         | Species                 | Substantial, regs | No         |
| Red-legged Kittiwake<br>( <i>Rissa brevirostris</i> )       | 0.4 (91%)        | 5.0 (32%)    | G2G3        | S2S3B, S2N | Yearround         | Species                 | Not substantial   | No         |
| McKay's Bunting<br>( <i>Plectrophenax hyperboreus</i> )     | 2.0 (92%)        | 4.0 (25%)    | G3          | S3         | Yearround         | Species                 | Not harvested     | No         |

## Appendix IV, continued.

| <b>Taxa</b>   | <b>Biological score</b> | <b>Action Score</b> | <b>Global rank</b> | <b>State rank</b> | <b>Alaska occurrence</b> | <b>Systematic significance</b> | <b>Harvest</b>       | <b>Peripheral</b> |
|---|-------------------------|---------------------|--------------------|-------------------|--------------------------|--------------------------------|----------------------|-------------------|
| Song Sparrow, Aleutian<br>( <i>Melospiza melodia maxima</i> )               | 2.0 (92%)               | 4.0 (25%)           | G5T4               | S3                | Yearround                | Subspecies                     | Not harvested        | No                |
| Western Sandpiper<br>( <i>Calidris mauri</i> )                              | -6.0 (84%)              | 4.0 (25%)           | G5                 | S5B               | Breeding                 | Species                        | Not substantial      | No                |
| Bristle-thighed Curlew<br>( <i>Numenius tahitiensis</i> )                   | -12.0 (74%)             | 4.0 (25%)           | G2                 | S2B               | Breeding                 | Species                        | Not harvested        | No                |
| Root vole, Amak Island<br>( <i>Microtus oeconomus amakensis</i> )           | -12.0 (74%)             | 4.0 (25%)           | G5T2T3             | S2S3              | Yearround                | Subspecies                     | Not substantial      | No                |
| Marten, Pacific<br>( <i>Martes americana caurina</i> )                      | -12.1 (74%)             | 4.0 (25%)           | GNR                | S2                | Yearround                | Subspecies                     | Substantial, regs    | Yes               |
| Blue whale, North Pacific<br>( <i>Balaenoptera musculus</i> )               | -20.0 (63%)             | 4.0 (25%)           | G3G4               | S2                | Transient                | Species                        | Not harvested        | No                |
| King Eider<br>( <i>Somateria spectabilis</i> )                              | -25.0 (54%)             | 4.0 (25%)           | G5                 | S3B, S3N          | Yearround                | Species                        | Substantial, regs    | No                |
| Laysan Albatross<br>( <i>Phoebastria immutabilis</i> )                      | -25.0 (54%)             | 4.0 (25%)           | G3                 | S3N               | Nonbreeding              | Species                        | Not substantial      | No                |
| Black Turnstone<br>( <i>Arenaria melanocephala</i> )                        | -26.0 (52%)             | 4.0 (25%)           | G5                 | S3N, S4B          | Yearround                | Species                        | Not substantial      | No                |
| Spotted seal<br>( <i>Phoca largha</i> )                                     | -27.6 (51%)             | 4.0 (25%)           | G4G5               | S3S4              | Yearround                | Species                        | Substantial, no regs | No                |
| Fork-tailed Storm-Petrel, plumbea<br>( <i>Oceanodroma furcata plumbea</i> ) | -38.0 (34%)             | 4.0 (25%)           | GNR                | SNR               | Yearround                | Subspecies                     | Not harvested        | No                |
| Common Loon<br>( <i>Gavia immer</i> )                                       | -38.4 (33%)             | 4.0 (25%)           | G5                 | S5B, S4N          | Yearround                | Species                        | Substantial, regs    | No                |
| Buff-breasted Sandpiper<br>( <i>Tryngites subruficollis</i> )               | -44.6 (24%)             | 4.0 (25%)           | G4                 | S2B               | Breeding                 | Species                        | Not harvested        | No                |
| Western Wood-pewee<br>( <i>Contopus sordidulus</i> )                        | -45.0 (23%)             | 4.0 (25%)           | G5                 | S4B               | Breeding                 | Species                        | Not harvested        | Yes               |
| Northern Waterthrush<br>( <i>Seiurus noveboracensis</i> )                   | -50.0 (13%)             | 4.0 (25%)           | G5                 | S4S5B             | Breeding                 | Species                        | Not harvested        | No                |
| Bank Swallow<br>( <i>Riparia riparia</i> )                                  | -52.0 (10%)             | 4.0 (25%)           | G5                 | S5B               | Breeding                 | Species                        | Not harvested        | No                |
| Pine Siskin<br>( <i>Carduelis pinus</i> )                                   | -52.0 (10%)             | 4.0 (25%)           | G5                 | S4S5              | Yearround                | Species                        | Not harvested        | No                |

## Appendix IV, continued.

| Taxa  | Biological score | Action Score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest              | Peripheral |
|---|------------------|--------------|-------------|------------|-------------------|-------------------------|----------------------|------------|
| Bohemian Waxwing<br>( <i>Bombycilla garrulus</i> )                                | -54.0 (8%)       | 4.0 (25%)    | G5          | S5B        | Yearround         | Species                 | Not harvested        | No         |
| Red-necked Phalarope<br>( <i>Phalaropus lobatus</i> )                             | -54.0 (8%)       | 4.0 (25%)    | G4G55       | S4S5B      | Breeding          | Species                 | Substantial, regs    | No         |
| Pacific Golden-plover<br>( <i>Pluvialis fulva</i> )                               | -58.0 (6%)       | 4.0 (25%)    | G5          | S4B        | Breeding          | Species                 | Not harvested        | No         |
| Northern red-backed vole<br>( <i>Myodes rutilus</i> )                             | -64.0 (2%)       | 4.0 (25%)    | G5          | S5         | Yearround         | Species                 | Not substantial      | No         |
| Hermit Thrush<br>( <i>Catharus guttatus</i> )                                     | -70.0 (1%)       | 4.0 (25%)    | G5          | S5B        | Breeding          | Species                 | Not harvested        | No         |
| Blackpoll Warbler<br>( <i>Dendroica striata</i> )                                 | -40.0 (30%)      | 2.8 (25%)    | G5          | S4B        | Breeding          | Species                 | Not harvested        | No         |
| White-fronted Goose, Tule<br>( <i>Anser albifrons elgasi</i> )                    | 14.0 (98%)       | 2.0 (24%)    | G5T1T2      | S1S2B      | Breeding          | Subspecies              | Substantial, regs    | No         |
| Alaskan hare, othus<br>( <i>Lepus othus othus</i> )                               | -8.0 (81%)       | 2.0 (24%)    | GNR         | SNR        | Yearround         | Subspecies              | Substantial, no regs | No         |
| Red-faced Cormorant<br>( <i>Phalacrocorax urile</i> )                             | -27.0 (52%)      | 2.0 (24%)    | G5          | S3         | Yearround         | Species                 | Substantial, regs    | No         |
| American Dipper<br>( <i>Cinclus mexicanus</i> )                                   | -48.0 (14%)      | 2.0 (24%)    | G5          | S5         | Yearround         | Species                 | Not harvested        | No         |
| Merlin<br>( <i>Falco columbarius</i> )  | -48.4 (14%)      | 2.0 (24%)    | G5          | S5B, S4N   | Yearround         | Species                 | Not substantial      | No         |
| North Pacific right whale, Eastern<br>North Pacific ( <i>Eubalaena japonica</i> ) | 15.5 (98%)       | 0.0 (21%)    | G1          | S1         | Yearround         | Species                 | Not harvested        | No         |
| Bar-tailed Godwit<br>( <i>Limosa lapponica</i> )                                  | -20.0 (63%)      | 0.0 (21%)    | G5          | S3B        | Breeding          | Species                 | Substantial, regs    | Yes        |
| Arctic Tern<br>( <i>Sterna paradisaea</i> )                                       | -32.0 (45%)      | 0.0 (21%)    | G5          | S4S5B      | Breeding          | Species                 | Not substantial      | No         |
| Long-tailed Duck<br>( <i>Clangula hyemalis</i> )                                  | -32.0 (45%)      | 0.0 (21%)    | G5          | S5B, S4N   | Yearround         | Genus                   | Substantial, regs    | No         |
| Rusty Blackbird<br>( <i>Euphagus carolinus</i> )                                  | -38.0 (34%)      | 0.0 (21%)    | G4          | S4B, S3N   | Breeding          | Species                 | Not harvested        | No         |
| Varied Thrush<br>( <i>Ixoreus naevius</i> )                                       | -46.0 (20%)      | 0.0 (21%)    | G5          | S5B        | Yearround         | Genus                   | Not harvested        | No         |

## Appendix IV, continued.

| Taxa  | Biological score | Action Score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest           | Peripheral |
|---|------------------|--------------|-------------|------------|-------------------|-------------------------|-------------------|------------|
| Black-bellied Plover<br>( <i>Pluvialis squatarola</i> )               | -48.0 (14%)      | 0.0 (21%)    | G5          | S4B        | Breeding          | Species                 | Not substantial   | No         |
| Steller's Eider<br>( <i>Polysticta stelleri</i> )                     | 25.4 (99%)       | -0.4 (21%)   | G3          | S2B, S3N   | Yearround         | Genus                   | Not harvested     | No         |
| Winter Wren, Semidi<br>( <i>Troglodytes troglodytes semidiensis</i> ) | 2.0 (92%)        | -2.0 (20%)   | G5T2T3      | S2S3       | Yearround         | Subspecies              | Not harvested     | No         |
| Western toad<br>( <i>Bufo boreas</i> )                                | -40.6 (29%)      | -2.0 (20%)   | G4          | S3S4       | Yearround         | Species                 | Not harvested     | Yes        |
| Double-crested Cormorant<br>( <i>Phalacrocorax auritus</i> )          | -42.4 (27%)      | -2.0 (20%)   | G5          | S3         | Yearround         | Species                 | Substantial, regs | No         |
| Pelagic Cormorant<br>( <i>Phalacrocorax pelagicus</i> )               | -56.0 (6%)       | -2.0 (20%)   | G5          | S5         | Yearround         | Species                 | Substantial, regs | No         |
| Killer whale<br>( <i>Orcinus orca</i> )                               | -18.0 (67%)      | -4.0 (14%)   | G4G5        | S4         | Yearround         | Species                 | Not harvested     | No         |
| Ribbon seal<br>( <i>Histiophoca fasciata</i> )                        | -19.0 (65%)      | -4.0 (14%)   | G5          | S3         | Yearround         | Genus                   | Not substantial   | No         |
| Black Scoter<br>( <i>Melanitta nigra</i> )                            | -20.4 (63%)      | -4.0 (14%)   | G5          | S3S4B, S3N | Yearround         | Species                 | Substantial, regs | Yes        |
| Fin whale, Northeast Pacific<br>( <i>Balaenoptera physalus</i> )      | -21.0 (61%)      | -4.0 (14%)   | G3G4        | S3         | Transient         | Species                 | Not harvested     | No         |
| Dunlin, Arctic<br>( <i>Calidris alpina arctica</i> )                  | -22.0 (59%)      | -4.0 (14%)   | GNR         | SNR        | Yearround         | Subspecies              | Not substantial   | No         |
| Three-toed Woodpecker<br>( <i>Picooides dorsalis</i> )                | -34.0 (42%)      | -4.0 (14%)   | G5          | S5         | Yearround         | Species                 | Not harvested     | No         |
| Red-necked Grebe<br>( <i>Podiceps grisegena</i> )                     | -35.0 (40%)      | -4.0 (14%)   | G5          | S4S5B, S4N | Yearround         | Species                 | Not substantial   | No         |
| Great Gray Owl<br>( <i>Strix nebulosa</i> )                           | -36.0 (38%)      | -4.0 (14%)   | G5          | S4         | Yearround         | Genus                   | Not harvested     | No         |
| Peregrine Falcon, American<br>( <i>Falco peregrinus anatum</i> )      | -36.0 (38%)      | -4.0 (14%)   | G4T3        | S3B        | Breeding          | Subspecies              | Not harvested     | No         |
| Pigeon Guillemot<br>( <i>Cepphus columba</i> )                        | -37.0 (37%)      | -4.0 (14%)   | G5          | S5         | Yearround         | Species                 | Not substantial   | No         |
| Chestnut-backed Chickadee<br>( <i>Poecile rufescens</i> )             | -38.0 (34%)      | -4.0 (14%)   | G5          | S5         | Yearround         | Species                 | Not harvested     | No         |



## Appendix IV, continued.

| Taxa   | Biological score | Action Score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest           | Peripheral |
|--|------------------|--------------|-------------|------------|-------------------|-------------------------|-------------------|------------|
| Rufous Hummingbird<br>( <i>Selasphorus rufus</i> )                                     | -39.0 (32%)      | -4.0 (14%)   | G5          | S4B        | Yearround         | Species                 | Not harvested     | No         |
| Yellow-billed Loon<br>( <i>Gavia adamsii</i> )   | -42.0 (27%)      | -4.0 (14%)   | G4          | S2S3B, S3N | Yearround         | Species                 | Not substantial   | No         |
| Gray-cheeked Thrush<br>( <i>Catharus minimus</i> )                                     | -44.0 (24%)      | -4.0 (14%)   | G5          | S4S5B      | Breeding          | Species                 | Not harvested     | No         |
| Red-throated Loon<br>( <i>Gavia stellata</i> )   | -46.2 (19%)      | -4.0 (14%)   | G5          | S4B, S4N   | Yearround         | Species                 | Not substantial   | No         |
| Pacific Loon<br>( <i>Gavia pacifica</i> )  | -48.0 (14%)      | -4.0 (14%)   | G5          | S5B, S4N   | Yearround         | Species                 | Substantial, regs | No         |
| White-winged Crossbill<br>( <i>Loxia leucoptera</i> )                                  | -48.0 (14%)      | -4.0 (14%)   | G5          | S5         | Yearround         | Species                 | Not harvested     | No         |
| Common Murre<br>( <i>Uria aalge</i> )  | -56.0 (6%)       | -4.0 (14%)   | G5          | S5         | Yearround         | Species                 | Not substantial   | No         |
| Swainson's Thrush<br>( <i>Catharus ustulatus</i> )                                     | -60.0 (4%)       | -4.0 (14%)   | G5          | S5B        | Breeding          | Species                 | Not harvested     | No         |
| Ermine<br>( <i>Mustela erminea</i> )   | -60.4 (4%)       | -4.0 (14%)   | G5          | S5         | Yearround         | Species                 | Substantial, regs | No         |
| Black Oystercatcher<br>( <i>Haematopus bachmani</i> )                                  | -19.0 (65%)      | -5.2 (14%)   | G5          | S2S3B, S2N | Yearround         | Species                 | Substantial, regs | No         |
| Thick-billed Murre<br>( <i>Uria lomvia</i> )   | -52.0 (10%)      | -6.4 (14%)   | G5          | S4         | Yearround         | Species                 | Not substantial   | No         |
| Rock Ptarmigan, Turner's<br>( <i>Lagopus mutus atkhensis</i> )                         | 11.0 (97%)       | -8.0 (11%)   | G5T2T3      | S2S3       | Yearround         | Subspecies              | Not substantial   | No         |
| Northern flying squirrel, Prince of Wales<br>( <i>Glaucomys sabrinus griseifrons</i> ) | 10.5 (96%)       | -8.0 (11%)   | G5T2        | S2         | Yearround         | Subspecies              | Not substantial   | No         |
| Rock Ptarmigan, Townsend's<br>( <i>Lagopus mutus townsendi</i> )                       | 9.0 (96%)        | -8.0 (11%)   | G5T2T3      | S2S3       | Yearround         | Subspecies              | Not substantial   | No         |
| Caspian Tern<br>( <i>Hydroprogne caspia</i> )  | -20.0 (63%)      | -8.0 (11%)   | G5          | S1S2B      | Breeding          | Species                 | Not harvested     | Yes        |
| Pink-footed Shearwater<br>( <i>Puffinus creatopus</i> )                                | -21.0 (62%)      | -8.0 (11%)   | G1G2Q       | S1S2N      | Nonbreeding       | Species                 | Not substantial   | No         |

## Appendix IV, continued.

| Taxa   | Biological score | Action Score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest              | Peripheral |
|--|------------------|--------------|-------------|------------|-------------------|-------------------------|----------------------|------------|
| Sperm whale, North Pacific<br>( <i>Physeter macrocephalus</i> )  | -23.0 (59%)      | -8.0 (11%)   | G3G4        | S3S4       | Transient         | Species                 | Not harvested        | No         |
| Red-breasted Sapsucker<br>( <i>Sphyrapicus ruber</i> )           | -44.0 (24%)      | -8.0 (11%)   | G5          | S5B        | Yearround         | Species                 | Not harvested        | No         |
| Harbor seal<br>( <i>Phoca vitulina</i> )                         | -46.0 (20%)      | -8.0 (11%)   | G5          | S4S5       | Yearround         | Species                 | Substantial, no regs | No         |
| American Robin<br>( <i>Turdus migratorius</i> )                  | -72.0 (0%)       | -8.0 (11%)   | G5          | S5B        | Yearround         | Species                 | Not harvested        | No         |
| Aleutian Tern<br>( <i>Oncychoprion aleuticus</i> )               | -31.7 (47%)      | -10.0 (9%)   | G4          | S3B        | Breeding          | Species                 | Not substantial      | No         |
| Common Eider, Pacific<br>( <i>Somateria mollissima</i> )         | -38.0 (34%)      | -10.0 (9%)   | G5          | S4B, S3N   | Yearround         | Subspecies              | Substantial, regs    | No         |
| Brown Creeper<br>( <i>Certhia americana</i> )                    | -44.0 (24%)      | -10.0 (9%)   | G5          | S4         | Yearround         | Species                 | Not harvested        | Yes        |
| Golden-crowned Kinglet<br>( <i>Regulus satrapa</i> )             | -46.0 (20%)      | -10.0 (9%)   | G5          | S4S5       | Yearround         | Species                 | Not harvested        | Yes        |
| Hairy Woodpecker<br>( <i>Picoides villosus</i> )                 | -59.5 (5%)       | -10.0 (9%)   | G5          | S5         | Yearround         | Species                 | Not harvested        | No         |
| Northern fur seal<br>( <i>Callorhinus ursinus</i> )              | -8.0 (81%)       | -12.0 (9%)   | G3          | S2S3       | Yearround         | Genus                   | Substantial, regs    | No         |
| Short-tailed Albatross<br>( <i>Phoebastria albatrus</i> )        | -32.0 (45%)      | -14.0 (9%)   | G1          | S1N        | Nonbreeding       | Species                 | Not substantial      | No         |
| Brandt's Cormorant<br>( <i>Phalacrocorax penicillatus</i> )      | 22.4 (99%)       | -16.0 (5%)   | G5          | S1B        | Yearround         | Species                 | Not substantial      | Yes        |
| Polar bear<br>( <i>Ursus maritimus</i> )                         | 15.5 (98%)       | -16.0 (5%)   | G3G4        | S2         | Yearround         | Species                 | Not substantial      | No         |
| Goshawk, Queen Charlotte<br>( <i>Accipiter gentilis laingi</i> ) | -9.0 (80%)       | -16.0 (5%)   | G5T2        | S2         | Yearround         | Subspecies              | Not substantial      | No         |
| Walrus<br>( <i>Odobenus rosmarus</i> )                           | -10.5 (77%)      | -16.0 (5%)   | G4          | S3         | Yearround         | Family                  | Substantial, no regs | No         |
| Whiskered Auklet<br>( <i>Aethia pygmaea</i> )                    | -27.6 (51%)      | -16.0 (5%)   | G4          | S4         | Yearround         | Species                 | Substantial, regs    | No         |
| Crested Auklet<br>( <i>Aethia cristatella</i> )                  | -29.6 (49%)      | -16.0 (5%)   | G5          | S5         | Yearround         | Species                 | Not substantial      | No         |

## Appendix IV, continued.

| Taxa   | Biological score | Action Score | Global rank | State rank | Alaska occurrence | Systematic significance | Harvest           | Peripheral |
|--|------------------|--------------|-------------|------------|-------------------|-------------------------|-------------------|------------|
| Canadian lynx<br>( <i>Lynx canadensis</i> )  | -31.6 (47%)      | -16.0 (5%)   | G5          | S4         | Yearround         | Species                 | Substantial, regs | No         |
| Black-legged Kittiwake<br>( <i>Rissa tridactyla</i> )                                  | -32.5 (44%)      | -16.0 (5%)   | G5          | S5B, S5N   | Yearround         | Species                 | Not substantial   | No         |
| Golden Eagle<br>( <i>Aquila chrysaetos</i> )   | -36.4 (38%)      | -16.0 (5%)   | G5          | S4B, S3N   | Yearround         | Species                 | Not substantial   | No         |
| Ringed seal<br>( <i>Pusa hispida</i> )   | -40.0 (30%)      | -16.0 (5%)   | G5          | S4         | Yearround         | Species                 | Substantial, regs | No         |
| Peregrine Falcon, Arctic<br>( <i>Falco peregrinus tundrius</i> )                       | -42.4 (27%)      | -16.0 (5%)   | G4T3        | S3B        | Breeding          | Subspecies              | Not harvested     | No         |
| Leach's Storm-petrel<br>( <i>Oceanodroma leucorhoa</i> )                               | -43.6 (26%)      | -16.0 (5%)   | G5          | S5B        | Yearround         | Species                 | Not harvested     | No         |
| Peregrine Falcon<br>( <i>Falco peregrinus</i> )  | -50.0 (13%)      | -16.0 (5%)   | G4          | S3B, S3N   | Yearround         | Species                 | Not harvested     | No         |
| Least Auklet<br>( <i>Aethia pusilla</i> )  | -25.0 (54%)      | -18.4 (5%)   | G5          | S5         | Yearround         | Species                 | Not substantial   | No         |
| Rock Ptarmigan, Evermann's<br>( <i>Lagopus mutus evermanni</i> )                       | 15.0 (98%)       | -20.0 (4%)   | G5T2        | S2         | Yearround         | Subspecies              | Not substantial   | No         |
| Spectacled Eider<br>( <i>Somateria fischeri</i> )                                      | -7.0 (84%)       | -20.0 (4%)   | G2          | S2B, S2N   | Yearround         | Species                 | Not harvested     | No         |
| Black-footed Albatross<br>( <i>Phoebastria nigripes</i> )                              | -26.0 (52%)      | -20.0 (4%)   | G3G4        | S3S4N      | Nonbreeding       | Species                 | Not substantial   | No         |
| Steller sea lion, Eastern U.S. stock<br>( <i>Eumatopias jubatus</i> )                  | -40.0 (30%)      | -20.0 (4%)   | G3          | S3         | Yearround         | Population              | Not substantial   | No         |
| Northern sea otter, SW Alaska population<br>( <i>Enhydra lutris kenyoni</i> )          | -31.2 (48%)      | -22.0 (2%)   | G4T3        | S3         | Yearround         | Population              | Not substantial   | No         |
| Ancient Murrelet<br>( <i>Synthliboramphus antiquus</i> )                               | -36.0 (38%)      | -22.0 (2%)   | G4          | S4         | Breeding          | Species                 | Not harvested     | No         |
| Northern sea otter, all 3 AK stocks<br>( <i>Enhydra lutris kenyoni</i> )               | -42.8 (26%)      | -22.0 (2%)   | G4T3        | S3         | Yearround         | Species                 | Not substantial   | No         |
| Humpback whale, Central and Western North Pacific<br>( <i>Megaptera novaeangliae</i> ) | -46.0 (20%)      | -22.0 (2%)   | G3          | S3         | Transient         | Species                 | Not harvested     | No         |

Appendix IV, continued.

| <b>Taxa</b>   | <b>Biological score</b> | <b>Action Score</b> | <b>Global rank</b> | <b>State rank</b> | <b>Alaska occurrence</b> | <b>Systematic significance</b> | <b>Harvest</b>    | <b>Peripheral</b> |
|---|-------------------------|---------------------|--------------------|-------------------|--------------------------|--------------------------------|-------------------|-------------------|
| Brown bear, Kenai population<br>( <i>Ursus arctos kenai</i> )               | 26.0 (99%)              | -26.0 (2%)          | GNR                | SNR               | Yearround                | Population                     | Substantial, regs | No                |
| Bowhead, Western Arctic<br>( <i>Balaena mysticetus</i> )                    | -9.0 (80%)              | -28.0 (1%)          | G4                 | S3                | Yearround                | Species                        | Not harvested     | No                |
| Fork-tailed Storm-Petrel, furcata<br>( <i>Oceanodroma furcata furcata</i> ) | -22.0 (59%)             | -28.0 (1%)          | GNR                | SNR               | Yearround                | Subspecies                     | Not harvested     | No                |
| Steller sea lion, Western U.S. stock<br>( <i>Eumatopias jubatus</i> )       | -24.0 (56%)             | -28.0 (1%)          | G3                 | S2                | Yearround                | Population                     | Not substantial   | No                |
| Bald Eagle<br>( <i>Haliaeetus leucocephalus</i> )                           | -28.3 (50%)             | -28.0 (1%)          | G5                 | S5                | Yearround                | Species                        | Not harvested     | No                |
| Cackling Goose, Aleutian<br>( <i>Branta hutchinsii leucopareia</i> )        | 12.4 (97%)              | -32.0 (1%)          | G3                 | S3B               | Breeding                 | Subspecies                     | Not substantial   | No                |
| Beluga whale, Cook Inlet population<br>( <i>Delphinapterus leucas</i> )     | 42.0 (100%)             | -40.0 (0%)          | G4                 | S4                | Yearround                | Population                     | Not substantial   | No                |
| Woodland caribou, Chisana herd<br>( <i>Rangifer tarandus caribou</i> )      | -2.0 (89%)              | -40.0 (0%)          |                    | SNR               | Yearround                | Population                     | Not harvested     | No                |

Appendix V. NatureServe/Heritage Program conservation status rank definitions.

| <b>Rank</b>         | <b>Definition</b>   |
|---------------------|---|
| <b>Global Ranks</b> |   |
| <b>G1</b>           | Critically imperiled globally - at very high risk of extinction due to extreme rarity, very steep declines, or other factors.                                 |
| <b>G2</b>           | Imperiled globally - at high risk of extinction due to very restricted ranges, very few populations, steep declines, or other factors.                        |
| <b>G3</b>           | Vulnerable globally- at moderate risk of extinction due to restricted range, relatively few populations, recent and widespread declines, or other factors     |
| <b>G4</b>           | Apparently secure globally - uncommon but rare; some cause for long-term concern due to declines or other factors.  |
| <b>G5</b>           | Secure globally - Common, widespread, and abundant.   |
| <b>G#G#</b>         | Range rank - range of ranks due to uncertainty.   |
| <b>GU</b>           | Unrankable due to lack of information.  |
| <b>GH</b>           | Historical occurrence   |
| <b>GNR</b>          | Unranked  |
| <b>GNA</b>          | Not applicable  |
| <b>State Ranks</b>  |   |
| <b>S1</b>           | Critically imperiled in the state - at very high risk of extinction due to extreme rarity, very steep declines, or other factors.                             |
| <b>S2</b>           | Imperiled in the state - at high risk of extinction due to very restricted ranges, very few populations, steep declines, or other factors.                    |
| <b>S3</b>           | Vulnerable in the state- at moderate risk of extinction due to restricted range, relatively few populations, recent and widespread declines, or other factors |
| <b>S4</b>           | Apparently secure in the state - uncommon but rare; some cause for long-term concern due to declines or other factors.  |
| <b>S5</b>           | Secure in the state - Common, widespread, and abundant.   |
| <b>S#S#</b>         | Range rank - range of ranks due to uncertainty.   |
| <b>SU</b>           | Unrankable due to lack of information.  |
| <b>SH</b>           | Historical occurrence   |
| <b>SNR</b>          | Unranked  |
| <b>SNA</b>          | Not applicable  |
| <b>Qualifiers</b>   |   |
| <b>B</b>            | Breeding status   |
| <b>M</b>            | Migratory status  |
| <b>N</b>            | Non-breeding status   |
| <b>?</b>            | Inexact   |
| <b>Q</b>            | Questionable taxonomically  |
| <b>T</b>            | Intraspecific taxon - subspecies or population  |