

Protocol Development Summary

Protocol: Bird Assemblages-Landbirds

Parks Where Protocol will be Implemented: BELA, CAKR, GAAR, NOAT, KOVA

Justification/Issues being addressed:

All 5 park units are mandated under ANILCA to protect habitat for and various assemblages of avian species (U. S. Congress 1980). The enabling legislation of the parks specifies protection for bird habitats and populations for all 5 Arctic Network of Alaska Parklands (ARCN). Under ANILCA [Section 201(8)], protection of populations of and habitat for waterfowl, raptors and other species of birds is specifically mandated in NOAT. For BELA, ANILCA specifies that the preserve shall be managed to protect habitat for internationally significant populations of migratory birds. In GAAR, the NPS is directed to protect habitat for and populations of raptorial birds. Kobuk Valley National Park was established in part to protect the viability of subsistence resources including populations of waterfowl. Lastly, for CAKR, ANILCA mandates protections including habitat for and populations of birds. In addition, several international treaties, federal laws and initiatives provide protections for migratory birds and require action by NPS (Migratory Bird Treaty Act, Endangered Species Act, North American Bird Conservation Initiative).

The ecology of various species of birds is highly variable and the arctic parklands are massive. One methodology can not appropriately monitor all birds. The landbirds assemblage (passerines, near-passerines and galliformes) was chosen by the ARCN for long-term monitoring because it encompasses a great variety of species that spend the majority of their life in terrestrial environments. Landbirds are easily detected and are well studied. Standardized methods for monitoring landbirds are well-established and currently utilized by several networks. Landbirds are an important component of park ecosystems, and their high body temperature, rapid metabolism, and high ecological position in most food webs make them good indicators of the effects of local and regional changes in ecosystems (Fancy and Sauer 2000). Changes in landbird ecology and demography have been demonstrated to be indicators of global climate change (Sillett et al. 2000). In addition, passerine birds comprise more than 50% of the bird species in ARCN.

Some passerine species represent the most commonly detected landbirds in ARCN because of their conspicuous nature and widespread distributions in arctic habitats. Within ARCN these species include the Savannah Sparrow *Passerculus sandwichensis* (SAVS), White-crowned Sparrow *Zonotrichia leucophrys* (WCSP), and American Tree Sparrow *Spizella arborea* (ATSP) (Guldager 2003, 2005; Tibbitts et al. 2006). A few relatively common passerine species in ARCN also have been identified as species of concern due to general lack of biological information, remote and/or limited distribution, and/or declines in numbers across North America. The landbird conservation plan for Alaska's biogeographic regions developed recommendations for broad-scale monitoring of the Gray-cheeked Thrush *Catharus minimus* (GCTH), Varied Thrush *Ixoreus naevius*

(VATH) and Golden-crowned Sparrow *Zonotricha atricapilla* (GCSP) in the Central, Western and Northern biogeographic regions of Alaska (Boreal Partners in Flight 1999).

Specific Monitoring Questions and Objectives to be Addressed by the Protocol:

Some of the specific monitoring questions that will be addressed by this protocol include:

1. What are the population trends in 6 common passerine species (GCTH, VATH, GCSP, ATSP, SAVS and WCSP) in selected sites across ARCN during the breeding season (June)?
2. What are the long-term trends in landbird species composition and distribution in selected sites across ARCN during the breeding season (June)?
3. In what habitat/vegetation associations are 6 common passerine species (GCTH, VATH, GCSP, ATSP, SAVS and WCSP) found in selected sites across ARCN during the breeding season (June) and how are these changing over time?

Our specific objectives are to:

1. Determine biennial long-term trends in density and frequency of occurrence of 6 common passerine species (GCTH, VATH, GCSP, ATSP, SAVS and WCSP) in selected sites across ARCN during the breeding season (June)?
2. Determine biennial long-term trends in landbird species composition and distribution in selected sites across ARCN during the breeding season (June)?
3. Improve understanding of breeding bird-habitat relationships and the effects of invasive plants and climatic changes on bird populations by correlating changes 6 common passerine species (GCTH, VATH, GCSP, ATSP, SAVS and WCSP) with composition and abundance with changes in specific habitat variables.

Basic Approach:

Objectives 1 and 2 are the top priorities for the landbird monitoring program. Objective 3 provides valuable insight into the health and status of landbirds in the selected sites of ARCN where monitoring will occur. Collection of vegetation and environmental variables will be collected for objectives 1 and 2 in association with the landbird survey as per ALMS and Guldager (2003). Habitat data including species composition, percent cover of various shrubs, grasses, mosses, lichens and other vegetation as well as classification of 100 m radius of vegetation to Viereck Level III (Viereck 1992) will be collected around each point. However, objective 3 will be approached adaptively depending on funding, staffing and allocation of time to this vital sign.

For objectives 1 and 2, methods for monitoring landbirds are well-established and have been refined and implemented by several networks. However, the extensive land areas of the ARCN present logistical and fiscal challenges for landbird monitoring. Some sampling designs are cost-prohibitive due to the dependence on extensive fixed-wing and/or helicopter support for remote access to sampling sites. For this reason, landbird monitoring for relative population levels, and bird-community composition and distribution in ARCN will be accomplished biennially using modified Alaska Landbird Monitoring Survey (ALMS: Handel and Cady 2004) protocols with limited inference

space along riparian corridors as per Guldager (2003, 2005). These affordable surveys were designed for 2-person crews to sample 12 transects (of 12 point-transects each) along major river corridors throughout ARCN. The survey consists of a systematic sampling design with a random start point, using variable circular plot methodology with unlimited distance estimation.

Landbird monitoring will occur biennially and during the breeding season (June) for the majority of passerine and other landbird species. Surveys are conducted as early as river access is possible after spring thaw.

Principal Investigators and NPS Lead:

The NPS leads on this vital sign will be Melanie Flamme (YUGA biologist). Collaborators in this process will be Teri McMillan (YUGA ranger), Susan Sharbaugh (Alaska Bird Observatory biologist) and Brad Shults (WEAR biologist).

Development Schedule, Budget, and Expected Interim Products:

Cooperative agreement will be established with the Alaska Bird Observatory (landbirds) to write protocols, train and hire technicians, and provide staff to perform some of the field work and analyses by December 2009.

Full development of the protocol will proceed on the following schedule:

- Spring 2009: Draft protocols and SOPs of survey techniques ready for peer review
- Spring 2010: Implement and test protocol (\$20,000-2 crews on 2 rivers)
- Spring 2011: Peer review and finalize protocol

Literature Cited:

Boreal Partners in Flight Working Group. 1999. Landbird conservation plan for Alaska biogeographic regions. Unpubl. Rep., U. S. Fish and Wildlife Service, Anchorage, AK.

Fancy, S. G. and J. R. Sauer. 2000. Recommended methods for inventory and monitoring of biological resources in national parks. National Park Service Inventory and Monitoring Program.

Guldager, N. 2003. Assess landbird species diversity, density, and habitat within Gates of the Arctic National Park and Preserve. Unpubl. Progress Rpt., PMIS#98917, National Park Service, Fairbanks, AK. 13 pp.

Guldager, N. 2005. Unpubl. Data. National Park Service, Fairbanks, Alaska.

Handel, C. M., and M. N. Cady. 2004. Alaska Landbird Monitoring Survey: protocol for setting up and conducting point count surveys. Sponsored by Boreal Partners in Flight. Unpubl. Protocol. USGS, Alaska Science Center, Anchorage, AK.

- Sillett, T. S., R.T. Holmes, & T.W. Sherry. 2000. Impacts of a global climate change on the population dynamics of a migratory songbird. *Science* 288: 2040-2042.
- Tibbitts, T. L., D. R. Ruthrauff, R. E. Gill, Jr. and C. M. Handel. 2006. Inventory of montane-nesting birds in the Arctic Network of National Parks, Alaska. Unpubl. Rep., National Park Service NPS/AKRARC/NRTR-2006-02, Fairbanks, AK. 142 pp.
- U.S. Congress. 1980. Alaska National Interest Lands Conservation Act, PUBLIC LAW 96-487- DEC.2, 1980. 94 STAT. 2371 (16 U.S.C. 3101 et seq).
- Viereck, L.A., C.T. Dyrness, A.R. Batten, and K.J. Wenzlick. 1992. The Alaska vegetation classification. Gen. Tech. Rep. PNW-GTR-286. Portland, OR, Pacific Northwest Research Station, Forest Service, U.S. Dept. of Agriculture. 278 pp.