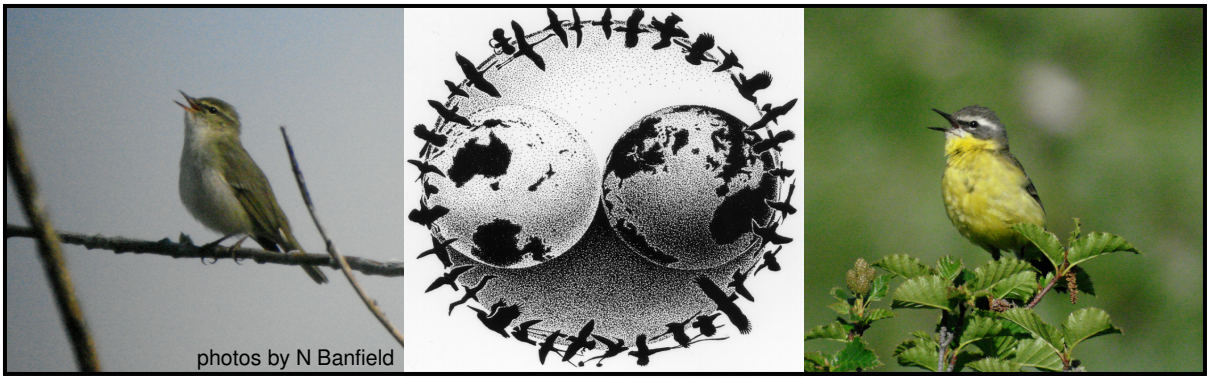
SAMPLING LANDBIRDS FOR AVIAN INFLUENZA IN ALASKA

A SYNOPSIS OF THE 2006 DILLINGHAM, UMIAT, AND NOME PROJECTS



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Introduction

Arctic Warbler (*Phylloscopus borealis*) and Eastern Yellow Wagtail (*Motacilla tschutschensis*) are the two highest-ranking passerine bird species for the early detection of highly-pathogenic avian influenza (HPAI) in North America. Here we report on HPAI surveillance-monitoring in Arctic Warblers, Eastern Yellow Wagtails, and other landbirds at three locations in Alaska in 2006. Sampling locations included sites near Dillingham in southwestern Alaska, along the Colville River near Umiat, and near Nome on the Seward Peninsula. Our sampling goals were 210 Arctic Warblers at each of these three locations and 50 Eastern Yellow Wagtails at the Seward Peninsula sites. We also report on efforts to link breeding and wintering areas of migratory birds and to study the demography of birds at sampling sites.

Methods

We established and operated fifteen Monitoring Avian Productivity and Survivorship (MAPS) stations during summer 2006 (DeSante et al. 2004) with the specific goal of sampling large numbers of individual birds of target species for HPAI. Five stations were operated near Dillingham, five were operated near Umiat, and five were operated on the Seward Peninsula. Each set of five stations was operated by a team of two field biologists (one supervisor and one intern). In addition to sampling at MAPS stations, Arctic Warblers were target netted using song and call playbacks at a variety of locales between, and in the vicinity of, MAPS stations. On the Seward Peninsula, we also had a team of two field biologists that targeted Eastern Yellow Wagtails using a variety of capture techniques. Specifically, birds were netted using playbacks and carved decoys, females were flushed from nests into mist nets, nestlings were captured at nests, and post-breeding birds were netted late in the season at migration staging areas. All captured birds of target species were aged, sexed, banded, and sampled for actively-shedding HPAI using fecal or cloacal swabs. Captured individuals of incidental (i.e., "non-target") species were also aged, sexed, and banded; they were sampled for HPAI to the extent that time and resources permitted. We pulled one inner and one outer rectrix from individuals of target species and from individuals of additional species for stable isotope or genetic analyses.

Additional goals of our field work in Alaska were to study avian demographic rates and to link avian demographic rates (survival, productivity) to habitat variables important for their determination. In this vein, we operated MAPS stations in a "constant-effort" manner and monitored the fates of Eastern Yellow Wagtail nests (Seward Peninsula only). We mapped and described the vegetation at MAPS stations following Nott et al. (2003). Habitat at wagtail nest sites and at paired random sites was quantified following a protocol based largely on Martin et al. (1997). Classification of habitat types at nest sites, random sites, and at MAPS stations followed Viereck et al. (1992).

All banding data are currently being entered by John W. Shipman of Zoological Data Processing, Socorro, NM. Digitized data will be proofed and run through a series of specialized verification programs to identify suspicious or conflicting data entries. Although not yet entered, we can report a broad summary of effort and capture totals here. All records of HPAI samples were computerized at field sites, and all samples were sent to the Alaska Science Center in Anchorage to be forwarded to the National Wildlife Health Center (NWHC) for testing. Habitat data are currently being entered by staff of The Institute for Bird Populations.

Results and Discussion

We obtained cloacal or fecal swabs from 1,024 birds of 30 landbird species (Table 1). Five-hundred eighty of these were from Arctic Warblers (92% of our overall target sample size for that species). An additional 60 were from Eastern Yellow Wagtails (120% of our target sample size for that species). We also obtained 104 cloacal or fecal swabs from two additional species listed as high priority for HPAI surveillance in North America: 11 samples were obtained from Bluethroats (*Luscinia svecica*) and 93 were obtained from Gray-cheeked Thrushes (*Catharus minimus*).

In addition to sampling for HPAI, we pulled retrices from 160 Arctic Warblers and 15 Eastern Yellow Wagtails as part of a collaborative project with Craig Ely of the USGS Alaska Science Center. Chief among the goals of this project is the use of stable isotope signatures in feathers to establish patterns of migratory connectivity. We pulled rectrices from 18 additional species for genetic analyses, again, with the principal aim of identifying links between breeding and wintering populations. Genetic samples are being processed by the Neotropical Migratory Bird Conservation Genetics Project of the Center for Tropical Research at the University of California, Los Angeles (headed by T.B. Smith). We view these cooperative projects as a critical component of understanding patterns of movement in migratory birds and the potential consequences of these patterns for the spread of avian infectious diseases.

As indicated above, a secondary objective of our Alaska field work is to obtain baseline demographic information on landbird populations in Alaska. To this end, we banded 1,114 birds on the Dillingham study areas, 1, 272 birds near Umiat, and 1,677 birds on the Seward Peninsula. Most birds were banded during the constant-effort operation of MAPS stations. Mist nets were operated during 1,261 net-hours at the Dillingham MAPS stations, 1,616 net-hours at the Umiat MAPS stations, and 1,331 net-hours at the Seward Peninsula MAPS stations. We registered 182 (within-season) recaptures at the Dillingham stations, 319 recaptures at the Umiat stations, and 489 recaptures at the Nome stations. If continued for at least three more years, sampling at these MAPS stations will allow the estimation adult apparent survival rates (a minimum of four years of data are required to construct "transient" survivorship models; Nott and DeSante 2002, Hines et al. 2004) and will provide basic information on temporal and spatial variation in productivity.

Additional data on productivity were gathered by monitoring of Eastern Yellow Wagtail nests. Twenty-three wagtail nests were located and monitored along the road system of the Seward Peninsula. Of these 23 nests, 16 (70%) fledged (or likely fledged) at least one young. The mean number of young fledged per nest was 1.91, a fledging rate that is similar to that which has been reported elsewhere in Alaska (2.1 young/nest reported by Moore 2000). Sixteen nests of other bird species were also encountered and described (and irregularly monitored) during field work.

Conclusions

Overall, the first field season of sampling landbirds for Asian H5N1 at the Dillingham, Umiat, and Nome (Seward Peninsula) was a resounding success. Although the target number of Arctic Warbler cloacal/fecal swab samples was slightly low overall (92% of our target sample size), sample numbers were very high at some sites (e.g., 162% of our target sample size was achieved at Umiat), and several new potential netting areas were discovered late in the season (particularly

on the Seward Peninsula where Arctic Warbler capture totals at other sites were relatively low). In addition, sampling for Eastern Yellow Wagtails (for which we did meet our target sample size) will be much more efficient in future years, as we spent a great deal of time during this first pilot field season in the testing and refining of capture techniques. Finally, our passive netting (primarily via the operation of MAPS stations) enabled us to sample large numbers of "incidental" species, some of which are of high priority for avian influenza surveillance monitoring in Alaska (species that breed or winter in Asia), and others that exhibit high potential for the spread avian influenza across the Americas (Neotropical migrants). Additional years of sampling will enable us to complete baseline avian demographic studies and will enable a more thorough assessment of the threat of the potential spread of highly pathogenic avian influenza viruses through wild landbirds.

Acknowledgements

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Table 1. Numbers of individual birds sampled for avian influenza (cloacal or fecal swabs) by the four landbird projects directed by The Institute for Bird Populations during summer 2006. Totals are broken down by age class; HY = hatching year, AHY = after hatching year (including second-year and after-second-year birds), and U = undetermined age.

	Dillingham			Umiat			Seward Peninsula		
Species	HY	AHY	U	HY	AHY	U	HY	AHY	U
Alder Flycatcher (*Empidonax alnorum*)	1	4	0	0	0	0	0	0	0
Northern Shrike (*Lanius excubitor*)	0	0	0	0	1	0	0	0	0
Gray Jay (*Perisoreus canadensis*)	0	0	0	0	2	0	0	0	0
Black-capped Chickadee (*Poecile atricapilla*)	1	0	0	0	0	0	0	0	0
Brown Creeper (*Certhia americana*)	0	1	0	0	0	0	0	0	0
Ruby-crowned Kinglet (*Regulus calendula*)	1	0	0	0	0	0	0	0	0
Arctic Warbler (*Phylloscopus borealis*)	37	102	0	158	181	2	27	65	8
Bluethroat (*Luscinia svecica*)	0	0	0	2	2	0	6	1	0
Gray-cheeked Thrush (*Catharus minimus*)	0	5	0	20	61	0	0	6	1
Swainson's Thrush (*C. ustulatus*)	4	17	0	0	0	0	0	0	0
American Robin (*Turdus migratorius*)	1	3	0	0	2	0	0	4	0
Varied Thrush (*Ixoreus naevius*)	2	8	0	0	0	0	0	0	0
Eastern Yellow Wagtail (*Motacilla tschutschensis*)	0	0	0	3	3	0	35	17	2
Orange-crowned Warbler (*Vermivora celata*)	13	24	0	0	0	0	0	1	1
Yellow Warbler (*Dendroica petechia*)	0	0	0	0	3	0	0	5	0
Yellow-rumped ("Myrtle") Warbler (*D. coronata*)	4	5	0	0	0	0	0	0	0
Blackpoll Warbler (*D. striata*)	1	1	0	0	0	0	0	1	0
Northern Waterthrush (*Seiurus noveboracensis*)	3	5	0	0	1	0	1	6	1
Wilson's Warbler (*Wilsonia pusilla*)	4	17	0	0	0	0	0	3	0
American Tree Sparrow (*Spizella arborea*)	0	0	0	9	11	0	0	1	1
Savannah Sparrow (*Passerculus sandwichensis*)	9	2	0	2	0	0	0	2	0
Fox Sparrow (*Passerella iliaca*)	2	1	0	8	2	1	0	1	0
Lincoln's Sparrow (*Melospiza lincolnii*)	6	7	0	0	0	0	0	0	0
White-crowned Sparrow (*Zonotrichia leucophrys*)	1	3	0	1	6	0	0	3	0
Golden-crowned Sparrow (*Z. atricapilla*)	1	8	0	0	0	0	0	0	0
Dark-eyed ("Slate-colored") Junco (*Junco hyemalis*)	4	10	0	0	0	0	0	0	0
Pine Grosbeak (*Pinicola enucleator*)	1	2	0	0	0	0	0	0	0
White-winged Crossbill (*Loxia leucoptera*)	0	1	0	0	0	0	0	0	0
Common Redpoll (*Carduelis flammea*)	1	4	0	0	7	0	0	3	0
Hoary Redpoll (*Carduelis hornemanni*)	0	0	0	0	5	0	0	2	0