

PROJECT: Inventory and Monitoring Plan for Breeding Birds in
Wrangell-St Elias National Park and Preserve

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INTRODUCTION:

Many bird species have experienced significant population declines over the past century. Habitat loss and forest fragmentation on breeding and wintering grounds, loss of wetlands to agricultural and urban development, and widespread pesticide use have all contributed to population declines. Of special concern in recent years has been the decline of neotropical migrants (birds that breed in the United States and Canada and winter in Mexico, the Caribbean Islands, or Central and South America). Some appear unable to adapt to the rapid deforestation on wintering areas and forest fragmentation on breeding grounds (Morse 1980, Terborgh 1989, Wilcove 1990). Over the last decade, their numbers have been declining at a significantly faster rate than short distance migrants or permanent residents (Robbins et al 1989).

"Almost one-half of all bird species that breed in North America are neotropical migrants. The majority of these migratory species are small landbirds (species that are not waterfowl, shorebirds, cranes, or seabirds). Alaska is no exception; entire populations of 29 species, 32% of all songbirds, breeding in Alaska, spend their winter south of the United States-Mexico border. More songbird species winter outside of the United States than any other group of birds that breed in Alaska (including shorebirds).

Neotropical migrant landbirds are an important component of the avian diversity of Alaska. The geographical position of Alaska supports a unique assemblage of landbirds that is duplicated nowhere else in the world. Landbirds constitute 51% of Alaska's breeding avifauna. Songbirds alone include 34% (91 species) of all species of birds that breed in Alaska. About 78% (109 species) of landbirds that breed in Alaska migrate outside of the state during the winter. Species breeding in the same habitat in central Alaska may migrate to markedly different wintering grounds. For example, gray-cheeked thrushes, Arctic warblers, and white-crowned sparrows all breed in central Alaska, yet winter in the Amazon Basin, Southeast Asia, and the southwestern United States, respectively.

Over three-quarters of the U.S. breeding range of several species of neotropical migrants (gray-cheeked thrush, alder flycatcher, blackpoll warbler and northern waterthrush) is within Alaska. Additionally, species that are found in restricted habitats

outside Alaska (e.g., Wilson's warbler) are more widespread in the state. Clearly, Alaska plays a crucial role in the development of a national neotropical migratory bird conservation program.

Alaska is also important to paleotropical migratory landbirds (species that breed in Alaska but winter in the USSR, Asia, and Africa). About 10% (9 species) of songbirds that nest in Alaska and migrate to the paleotropics, breed nowhere else in the U.S. Little is known about the population status or biology of this group. The effects of deforestation in the Paleotropics, the highest rate in the world, warrants concern for these species.

Although the plight of neotropical migrants has received much attention in recent years, populations of other landbird species have been undergoing similar declines. Drastic changes in populations of migratory landbirds that winter in the southern U.S. have been documented. Many short-distance migrants that breed in Alaska (e.g., ruby-crowned kinglet and white-crowned sparrow) winter in rapidly changing habitats in the southwestern and western U.S.. Breeding ranges of several species in the U.S. (e.g., Smith's longspur, American tree sparrow, and golden-crowned sparrow) are essentially restricted to Alaska.

Habitat alteration is generally occurring at a slower rate in Alaska than in the rest of the country. Alaska's breeding landbird populations could serve as controls to determine whether breeding ground effects are an important factor in population changes. For example, if populations in Alaska decline despite no appreciable changes in habitat and maintain high productivity, causes can be indirectly attributed to changes on the wintering grounds or at migratory stop-overs. Proposed large-scale timber harvest in the Northwest Territories elevate the importance of Alaska to a continent-wide conservation strategy for boreal forest breeding birds.

The importance of Alaska to a global conservation strategy for migratory landbirds is clear. Broad-scale threats to migratory landbirds necessitate that all components of the Alaska breeding avifauna (paleotropical, neotropical, and short-distance migrants) be considered. The effectiveness of a conservation strategy for migratory landbirds hinges on cooperation" (Andres 1994a). Participation of government agencies (state and federal), and private organizations, is crucial to obtain adequate data on regional population trends and to develop and implement management strategies for the conservation of migratory landbirds in Alaska and elsewhere.

Education will be an important aspect of a landbird conservation program. Within WRST, resource management personnel should work closely with interpretation by providing information to help educate visitors and the local community about the natural history and plight of migratory landbirds.

Population trends of migratory landbirds in WRST will be monitored using the National Biological Service (NBS) Breeding Bird Survey (BBS), off-road point counts, and a migration banding station. Demographic information will be gathered using the Monitoring Avian Productivity and Survival (MAPS) program. Due to the limited number of point counts (BBS and off road) and banding stations (migration and MAPS) in Alaska, data from individual areas (e.g. WRST) are most useful in determining statistically significant declines in species on a regional rather than local level. Each method contributes a part of the picture and these data will likely be used in concert to confirm population trends on a regional level (B Andres, USFWS, pers commun).

The BBS was initiated in 1966 as a joint program between the USFWS and the Canadian Wildlife Service to monitor population trends of North American breeding birds. The BBS is an index, not a census of bird populations. Survey data provide both local and continental information on long- and short-term population trends and shifts, normal year-to-year variation, and invasion of exotic species (Robbins et al 1986). Trend data can be used to assist management in determining if, and to what degree, a species is declining, thus providing an opportunity to employ research or management techniques before irreversible events occur. The BBS initially detected declines in neotropical migrants. WRST began two BBS survey routes along the McCarthy and Nabesna roads in 1989. A third survey route was added along the west end of the McCarthy road in 1990 and a fourth route was added along the Tok Cut-off north of Nabesna (Slana route) in 1994.

The BBS survey route consists of 50 points placed along a road. This, however, represents a problem for sampling bird habitat in much of Alaska and other roadless areas in the US and Canada. Protocol for off-road point counts was established by Ralph et al (1993) in an attempt to provide and standardize methodology for sampling roadless areas. This methodology was further refined and standardized by the Boreal Partners in Flight Working Group for Alaska and Western Canada in 1993. Off-road point counts are similar to the BBS but are much shorter in length (12 points) and vary slightly in the way data are recorded. Off-road point counts sample specific habitats or target species. Three off-road survey routes, 2 in May Creek and 1 in Chisana, were established in 1992. A fourth route was added in Chisana (Gold Hill) in 1994. Additional routes may be placed in habitat types that are not adequately sampled along current survey routes or where specific species are targeted.

Even with BBS and off-road point counts, there are large areas of WRST which are not able to be sampled. Data collected at migration banding stations provides information on many species which are not able to be adequately sampled by other methods. Population trends from migration banding stations corresponded

well with BBS routes in the same physiographic area (Hagan et al 1992, Hussell et al 1992, Pyle et al, Point Reyes Bird Observatory, unpubl data). Yakutat was identified by the Boreal Partners in Flight Working Group as an area in which a migration banding station should be established. WRST cooperated with USFWS and US Forest Service (USFS) to establish a fall migration banding station in Yakutat during 1994. This station monitors birds migrating along coastal routes. Birds captured in Yakutat could be from breeding populations inhabiting coastal sections of WRST.

Productivity, survivorship, and recruitment data are essential for understanding population dynamics and identifying possible causes for population changes. The MAPS program uses habitat specific constant-effort mist netting to provide estimates of post-fledging productivity based on the ratio of young to adult birds captured; and estimates of survivorship, recruitment, and population size based on capture-recapture data. MAPS can be designed to monitor species or habitats of concern. May Creek has been identified as a potential MAPS station site.

Data collection in WRST in order of priority should be as follows: 1) Breeding Bird Surveys (BBS), 2) Off-road point counts, 3) Fall migration banding station 4) Monitoring Avian Productivity and Survival (MAPS).

OBJECTIVES:

- 1) Document general abundance and seasonal distribution of bird species within WRST.
- 2) Monitor long and short term population trends of breeding birds in WRST using the USFWS BBS, off road point counts, and a migration banding station.
- 3) Monitor demographic population information using the Monitoring Avian Productivity and Survival (MAPS) protocol.

Objective 1. Document general abundance and seasonal distribution of bird species within WRST.

A WRST bird list was developed by K Beck in 1988. This list needs to be verified and expanded and species distributions need to be documented. Limited data is currently available for WRST. Distributional information is most easily documented using species checklists (Neotropical Bird Monitoring Working Group 1992). Checklists will allow biologists to compile an accurate species list and track any changes in distributional patterns of birds over time.

WRST staff participates in an area wide effort to document spring arrival dates of birds within a 75 mile radius of Glennallen. K Roberson, Box 375, Glennallen, AK 99588 has maintained a database

on spring arrival dates of birds in the Copper River Basin since 1971. B Kessel has suggested that first arrival dates of individuals are not as important as peak arrival dates for a species. Both dates should be noted when possible. A form for listing spring arrival dates of birds should be posted next to the copy machine from March 15 - June 15 (and a copy sent to K Roberson) each year.

Experienced birders have been asked to keep checklists that document **species, numbers, location**, breeding status, habitat, **effort**, and **date** while working or traveling in remote areas throughout WRST. The Resource Management Specialist should note the name and experience level of the observer on all bird lists received so reliability of sightings is documented. Species lists will be maintained in the Resource Management Office and the master bird list will be updated annually. All bird observations are entered into the dBASE file D:BIRDSREC.DBF. Instructions for entering data into BIRDSREC.DBF are found in BIRDSREC.DOC (Word Perfect file). BIRDSREC.DBF consists only of bird lists given to the Resource Management Specialist by individuals who observed birds throughout and adjacent to Wrangell-St Elias National Park and Preserve. It does not include any birds already reported in scientific publications, Park technical reports, or breeding bird surveys and should therefore not be considered a complete list but rather a supplement to these documents. Rare species should be documented by photograph, live capture, or by recording song whenever possible and information on breeding status should be obtained. A 'Rare Bird Report Form' (Fig. 1), found in Word Perfect file BIRDREP.FRM, should be filled out by the observer. The resource management specialist should report rare sightings to T Tobish, Regional editor for American Birds (Box 196650, Anchorage AK 99519), and D Gibson of the University of Alaska Museum (907 Yukon Drive, Fairbanks AK 99701). Any nests encountered should be recorded on a North American Nest Record Card provided by Cornell Lab of Ornithology (Fig. 2). Copies of nest record cards should be sent to Cornell Lab of Ornithology (159 Sapsucker Woods Road, Ithaca, NY 14850) and Brina Kessel (University of Alaska Museum, 907 Yukon Drive, Fairbanks, AK 99701).

In addition to field checklists, USFWS has initiated a checklist project similar to the Breeding Bird Atlas program to document the distribution and abundance of species in various habitats within Alaska. This project was developed to standardize the collection of basic bird checklist data so that data could be compared over years to document changes in distribution and abundance (Andres 1995b). Analysis of trends generated from reporting frequencies of standardized checklists completed during the breeding season corresponded well with local BBS trends in Wisconsin (Temple and Carey 1990) and in Quebec (Cyr and Larivee 1993). The sample unit of the checklist project is a township. WRST should attempt to sample 1 township per breeding season (June 1-August 1) using methods described by Andres (1995b).

BIRD RECORD REPORT FORM

1. English and Scientific Names:
2. Number of individuals, sexes, ages, general plumage (e.g. 2 adults in breeding or alternate plumage):
3. Location (be as specific as possible):
4. Date(s) when observed:
5. Time(s) of day when observed:
6. Reporting observers and address:
7. Other observers accompanying reporter who also identified the bird(s):
8. Other observers who independently identified the bird(s):
9. Light conditions (position of the bird in relation to shade and to direction and amount of light):
10. Optical equipment:
11. Distance to bird(s):
12. Duration of observation:
13. Habitat:
14. Behavior of bird/circumstances of observation (flying, feeding, resting, singing; include and stress habits used in identification; related events surrounding observation):
15. Description include only what was actually seen, not what should have been seen; include if possible: total length/relative size compared to other familiar species, body bulk, shape, proportions, bill, eye, leg, and plumage characteristics. Stress features that separate it from other species):

Figure 1. Report form for documenting rare birds in Wrangell-St Elias National Park and Preserve.

Townships do not need to be randomly chosen and can be areas where other work is being completed.

Objective 2: To monitor long and short term trends of breeding birds in WRST using the USFWS BBS, off road point counts, and a migration banding station.

STUDY AREA:

The study area for the BBS and off road points counts currently (1994) consists of 8 survey routes (See Appendix 1 and 2 for route descriptions). Maps are in Resource Management files:

BBS ROUTES

- 1) Nabesna Road (99-006)
- 2) McCarthy Road East (99-005)
- 3) McCarthy Road West (99-010)
- 4) Slana (03-007)

OFF ROAD POINT COUNTS

- 1) Chisana 1
- 2) Chisana 2
- 3) May Creek 1
- 4) May Creek 2

Additional off-road survey routes may be selected in proportion to major habitat types within the Park, including some along coastal areas. GIS will be used to identify habitat types and potential access (e.g. airstrips) to sites. At present, it is not feasible to establish more than the 8 existing survey routes.

METHODS:

A. Breeding Bird Survey Technique: (road-side survey)

This technique is taken directly from the USFWS BBS protocol (Robbins et al 1986). It is a summary of the procedure with additional information specific to WRST added. All participants in the BBS should read the detailed instructions provided by the USFWS carefully before conducting the survey (Appendix 3). The protocol for the BBS must be strictly adhered to, to avoid biases in statistical analysis of the data.

Each route consists of 50 stops, located at 0.5 mile intervals along a 24.5 mile section of road. The observer records the number of individuals per species, heard or seen, during a 3-min period. Statistical analysis of trends follow Geissler and Sauer (1990). Each survey route requires 2 people, one to record data and one to identify birds. It will be important for observers to review birds songs prior to the survey since over 70% of birds are identified by song. Bird tapes will be provided in the Resource Management Office beginning in mid-April. Bird lists compiled from species recorded along individual routes (BBS and Off Road Point Counts) are found in Appendix 4. While other species may be recorded, observers should, at a minimum, review

those birds previously recorded on their survey route. Observers are also encouraged to sharpen their identification skills in the field prior to surveys since local songs sometimes vary slightly from those heard on tapes. Because acute hearing is extremely important for bird identification, observers with a hearing loss should not conduct the BBS. It is essential that all participants have adequate training to identify birds by sight and song. Because changes in observers influence long-term trend estimates (Geissler and Sauer 1990), permanent NPS personnel or local volunteers (as opposed to seasonals which may change annually) should be recruited whenever possible to perform surveys. This applies to both BBS and off road point count routes.

The optimal dates for the BBS are June 10-20. Target dates are June 13 for the McCarthy Road routes and June 15-16 for the Nabesna and Slana routes. Routes should be run as close to these dates as possible although similar weather conditions are more important than conducting surveys on the same day each year. The Nabesna route is a higher priority than the Slana route since it has been run for a greater number of years and should always be completed first. All other BBS routes have equal priority. The starting time for the survey is 0320 hours. Although there is no darkness at this time of year in Alaska, Spindler and Kessel (1980) determined the greatest singing activity takes place between 0300 and 0800 (AST). The survey must start on time and be completed within 4 to 4.5 hours when bird singing activity is greatest. USFWS has indicated it is acceptable to extend the survey to 5 hours since road conditions in WRST make it difficult to complete the survey within the allotted 4-4.5 hours. However, data from routes taking longer than 5 hours will not be accepted due to the decrease in singing activity as the day progresses. The survey pace is quick. Most reviewing tapes, etc..., must take place in the vehicle while in route to the next stop to stay within the time limits. Observers may wish to camp near starting points the night before the survey to avoid delays early in the morning.

Data sheets are provided by USFWS (Appendix 5). They should be filled out in dark pencil or black waterproof ink. Start and finish time should be recorded at the top of each data sheet and weather (temperature in Fahrenheit, winds, and sky conditions) should be recorded at the beginning and end of the survey. Good visibility, light winds, and little or no precipitation are preferred survey conditions. Occasional light drizzle or brief shower will not affect bird activity but fog, steady drizzle, or prolonged rain should be avoided. The survey should not be run in winds >12 mph. Winds should be recorded using the Beaufort Scale (Table 1).

Table 1. Beaufort scale for recording wind speeds and sky condition codes for BBS surveys (From USFWS BBS instructions).

Beaufort Number	Wind Speed in Miles Per Hour	Indicators of Wind Speed
0	Less than 1	Smoke rises vertically
1	1 to 3	Wind direction shown by smoke drift
2	4 to 7	Wind felt on face; leaves rustle
3	8 to 12	Leaves, small twigs in constant motion; light flag extended
4	13 to 18	Raises dust and loose paper; small branches are moved
5	19 to 24	Small trees in leaf sway; crested wavelets on inland waters

Sky condition codes:

0	Clear or a few clouds	5	Drizzle
1	Partly cloudy (scattered) or variable sky	7	Snow
2	Cloudy (broken) or overcast	8	Showers
4	Fog or smoke		

It is important that each stop be made in the same location from year to year. Odometers tend to vary between vehicles. When identifiable route descriptions are available (e.g. milepost 28), stop at the description and readjust your mileage. This will keep you as close as possible to the original stops. Route descriptions are found in Appendix 1 and in Beck 1990 and Cook 1991. Maps are on file in the Resource Management Office. Counts should begin with stop number 1 and routes should not be reversed. Counts are done from outside the vehicle but from a stationary point; only one observer should count. Every bird seen within 0.25 miles or heard should be counted during 3 minutes at each stop. Do not exceed 3 minutes and **do not coax birds** under any circumstances. Count individuals (except dependent young or downy chicks of water and shorebirds) of all species seen or heard during each 3 minute period. Be careful not to count any birds known, or strongly suspected, to have been counted at a previous stop. Only estimate flocks too large to count in the brief time they are seen. Any bird known to be a non-breeder (late migrant, injured bird, or summer vagrant) should be included but marked as such on the summary sheet. Species that are not found on the data sheet provided can be added at the bottom. If you are unsure of similar species, (e.g. lesser or greater scaup), this can also be listed at the bottom (e.g. scaup, unknown). Identification that can be narrowed to two similar species will still be entered into the data set and should be included on the summary sheet. If you can only categorize more generally to several possible species (e.g. woodpecker, unknown), the information should still be recorded since it may help to explain gaps in data in the future but will

not be entered in the data set and does not need to be recorded on the summary sheet. Any species unusual to the area should be verified by including some details of the observation. Because automobile traffic can be influencing the detectability of birds on some BBS routes, the number of cars passing during the survey each year should be recorded. This factor can then be examined by the Alaska BBS coordinator over the long-term to evaluate whether such conditions may be contributing to declines in detections.

Upon completion of the route, the data should be transferred from the Field Sheet to the Summary Sheet. The species total for each of the 5 Field Sheets should be entered under the appropriate page total columns. The sum of these 5 columns should then be entered into the Total Individuals column. The number of stops, out of the total of 50, at which each species was seen should be entered in the Stops per Species column. Because some species may be inadvertently omitted when transferring data, original field sheets should be sent to USFWS. Copies are maintained in the Resource Management Files at WRST.

The BBS is a cooperative effort and survey data is sent to:

Breeding Bird Survey
US Fish & Wildlife Service
Laurel, MD 20708

USFWS will provide data sheets, instructions, and return envelopes annually for data collection. Original data sheets are returned to USFWS, WRST maintains copies. Data is summarized and returned to WRST.

B. Breeding Bird Survey Technique: (off-road)

Off-road sampling consists of point counts similar to the BBS and should target species or habitats that are not well sampled by the BBS. Criteria for establishing off-road survey routes should follow Handel (1993). Methodology for running off-road routes follows recommendations of the National Neotropical Bird Conservation Committee and sampling is standardized nationwide (Ralph et al 1993). Methodology was further standardized in 1993 on a regional basis by the Boreal Partners in Flight Working Group. The following is a summary of those recommendations and is taken directly from Boreal Partners in Flight Working Group recommendations summarized by C. Handel, National Biological Survey, Anchorage, AK.

Stations consist of 12 points spaced 250 m apart in forested habitats and 500 m apart in open habitats. Points in open habitats are more widely spaced due to the greater detectability of birds at further distances (e.g. to avoid recounting the same birds). Observers should attempt to standardize count stations as much as possible. Landmarks unique to individual stations should be described. Observers should review pacing annually to

minimize variation and use a Global Positioning System (GPS) when available. After several years of running off-road point counts, it has become clear that it is advantageous to use a GPS or mark stops whenever possible. This is especially true on long routes (e.g. Chisana) where stops are 500 m apart and routes are non-descript. Variations in trail conditions (e.g. wet vs dry) and observers can result in differences in pacing. The differences become cumulative along the route so that by the last stops, observers can be substantially off. Use of a GPS or markers would help minimize effects of cumulative distance errors.

Observers will remain at each station 5 minutes, recording all birds seen or heard in the first 3 minutes separate from those in the remaining 2 minutes (for comparison with BBS data). The count circle is of unlimited radius with birds detected < 50 m from the observer recorded separately from those > 50 m (for comparison with habitat data). Distance estimates are especially important in open habitat. Since loudness can vary greatly among species, habitats, and with the orientation of the individual, practice in estimating distances of singing birds prior to the survey is essential. Before surveys are begun, observers should practice placing markers 50 m away to become consistent in estimating distance. They should also attempt to locate some birds visually and then pace the distance to test the accuracy of their distance estimates.

Birds that fly over the census area are recorded separately. Flyovers should be considered only those individuals that are flying above the canopy that are not associated with the habitat in the area. For example, ducks that are flying above a closed forest with no water nearby would constitute flyovers but redpolls flying over a forested area would not. Any species seen or heard only between points should be recorded in the notes section under the circular map. At the end of the route, compile a list on the "Miscellaneous Field Notes" page of those species that were not recorded on any of the point counts but only between them. This will help construct a species list for each route as well as each point. Appendix 6 contains instructions and a sample data sheet for off-road point counts.

Birds should be recorded using the 4 letter AOU code for that species provided on the back of each booklet. If the species is not listed, spell out the name completely. Identify subspecies that are easily distinguishable by plumage. If a bird cannot be identified to species, spell out the closest identification, e.g. unidentified sparrow. For each species, record the total number of individuals detected by S=singing, C=calling (sex unknown), V=visual, P=pair, M=male, and F=female. For example, you might have the following entry for MYWA: 2S, 1V in the 0-3 min block <50 meters. Codes are listed on the inside back cover of each of the survey booklets.

Optimal survey dates for the off-road point counts are June 9-10 for the two May Creek routes and June 11-12 for the Chisana

routes. Surveys should be run as close as possible to these dates and should begin at 0400 hours. Route maps are maintained in the Resource Management Office. Route descriptions are found in Appendix 2. Acceptable weather conditions are the same as the BBS.

Vegetation Analysis:

It is important to classify vegetation types along BBS routes and off road points since vegetative characteristics will influence what bird species are observed and changes in numbers over time. Vegetation classification is based on two methods, the Avian Habitat Classification for Alaska (Kessel 1979) and Alaska Vegetation Classification (Vierick et al. 1992). The vegetation information collected will be used to analyze broad patterns of bird distribution within various habitat types in Alaska. Appendix 7 contains instructions and a sample data sheet for habitat measurements collected on off-road point counts used in statewide analysis. Density estimates for forested habitat are measured using a densiometer which is stored in the Resource Management Office. Vegetation should be re-sampled every 10 years or when significant habitat changes occur along the route (e.g. fire, logging, development).

Habitat along BBS routes has been previously described in WRST using Kessel (1979) and Vierick et al. (1992) directly (Beck 1990, Cook 1991). No habitat measurements were taken. The avian habitat classification system for Alaska characterizes avian habitats on the life form and height of the vegetation, topography, and the physical nature and relative moisture content of the substrate. It is not a vegetation or landform classification system, but instead describes habitats used by birds (Kessel 1979). The 2 morphologic features with the greatest impact on Alaskan avian community ecology relate to the occurrence and characteristics of water and woody plant growth. The corresponding vegetation type found in the Alaska Vegetation Classification by Viereck et al. (1992) was also described.

Off road point counts are a cooperative effort and survey data is sent to:

Colleen Handel
Alaska Fish & Wildlife Research Center
1011 East Tudor
Anchorage, AK 99507

NBS will provide data sheets, instructions, and return envelopes annually for data collection. Original data sheets are returned to NBS, WRST maintains copies. Data is summarized and returned to WRST.

Migration Banding Station:

STUDY AREA:

Yakutat was identified by the Boreal Partners in Flight Working Group as an area in which a migration banding station should be established. WRST cooperated with USFWS and USFS to establish a fall migration banding station in Yakutat during 1994. This banding station will be the primary responsibility of the USFWS. However, WRST will be an integral cooperator and may take over operation of the station in years when it cannot be run by USFWS or USFS. A minimum commitment of 10 years is required to obtain meaningful trend data from a migration station.

METHODS:

Standardized methodology for migration banding recommended by the Boreal Partners in Flight and national Partners in Flight working groups is described in Fadley et al (1995) and Hagan et al (1994). A preliminary bird list can be found in Appendix 4.

Fall migration banding requires a constant effort (e.g. every day, or a minimum of 4 out of 5 days for >6 hours/day) from August 1 to October 1 to maintain constant detection or capture rates at a station across all years. Standardized counts should also be conducted along with banding at the station (Andres 1994a). Weather variation will be a factor in trend analyses of migration data (Hussell et al. 1992). Daily weather data is collected at the Yakutat airport.

Objective 3: Monitor demographic population information using the Monitoring Avian Productivity and Survival (MAPS) protocol.

STUDY AREA:

One permanent MAPS station will be established at May Creek if funding becomes available in the future. Personnel from the Alaska Bird Observatory (Fairbanks, AK) will be contracted to assist in choosing a specific site.

METHODS:

"Each station operates 10-20 mist nets once every 10 days throughout the breeding season from June 1-August 1 in central Alaska (≈ 6 periods). Nets are placed at a density of 1.25 - 1.5 per hectare in areas that achieve high capture rates and will have long-term continuity. Estimates of adult survival and productivity are used to monitor the health of bird populations. Environmental variables can be incorporated into analyses to isolate human-induced factors that are responsible for demographic changes. Point counts are also conducted within the

confines of the mist netting station. A variety of models have been developed to determine survivorship from capture-recapture data (Nichols 1992)" (Andres 1994a). Detailed methodology and data forms are described in Ralph et al (1993).

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Appendix 1. Survey route descriptions for BBS routes in
Wrangell-St Elias National Park and Preserve.

Breeding Bird Survey
Nabesna Road Route Description

Stop

- 1 Mile 37 marker. Approximately 100 feet NW of the creek in
Section 25 flowing towards Section 19, check map
- 3 Culvert after Jack Cr. (this stop is actually ~ 0.1 mi
beyond but it has been done here)
- 5 Boyden Creek (just SE of)
- 6 SE end of small road bypass
- 7 NW end of small road bypass, Radiator Creek, Milepost 34
- 8 Just below crest of hill
- 9 Milepost 33, just after right turn, meadow to S
- 11 Milepost 32
- 12 Lost Creek
- 13 Milepost 31 (just short of)
- 14 Middle of left bend
- 15 Milepost 30
- 16 0.1 mi beyond Trail Creek
- 17 Milepost 29, before Sportsman Lodge
- 18 NW end of Sportsman's airstrip
- 19 Milepost 28. Twin Lakes, W end (top of hill)
- 20 Culvert
- 21 Small gravel pit on either side of road
- 22 Small culvert
- 23 Milepost 26, just E of private drive and Little Jack Creek
- 24 Just before Bertrand's lodge
- 25 Milepost 25
- 26 Tanada Lake Trail
- 27 Milepost 24
- 29 W end of Long Lake
- 30 Rock Lake (Just W of crest of hill, looking down at left
turn around lake).
- 31 Milepost 22
- 32 0.2 mi W of Rock Creek
- 33 Milepost 21
- 34 A hill can be seen off to the N
- 36 Small drainage culvert
- 37 Milepost 19
- 38 On top of a hill
- 39 Milepost 18
- 41 Milepost 17, small lake to the S
- 45 Just past Milepost 15
- 48 At culvert for small ephemeral drainage
- 50 Just past trail head to Copper Lake

Breeding Bird Survey
McCarthy Road East Route Description

Stop

- 7 Mountain depot
- 10 Lake
- 13 Sift Creek (Old White Truck). Observer moves about 100 feet east of Swift Creek so can hear birds over water.
- 19 Michal mailbox
- 24 Old tressel
- 25 Long Lake (middle)
- 28 Long Lake (slump in road)
- 29 Long Lake (end)
- 32 Lakina Bridge
- 37 Crystal Lake
- 47 Milepost 37

Breeding Bird Survey
McCarthy Road West Route Description

Stop

- 1 Adjacent to entry sign for WRST, E of the Copper River bridge
- 2 Bluff above and S of the Kotsina River floodpoain, railroad ties on N
- 3 Bluff above and S of Kotsina River floodplain, small turnout recently cleared on N side of road, bank ending on south
- 4 Just past parking area on N side of road, clear cut on both sides of 0.1 mi before stop (visible from this stop but continuous behind tall willow scrub along road)
- 5 Just before bend in the road to the N, extensive logging visible on forest
- 6 Private property sign on N
- 8 Adjacent to pullout and overlook of Chitina River to S
- 10 New gravel logging road on N side of raod between stops 9 & 10
- 12 Just before new logging "Mile 7" sign on N side of road
- 18 One car length past Strelna Lake road to the north and milepost 10 (not there anymore) to the S: Sign: "Strelna Lake ½ mi" 10 m E of stop
- 19 Car length W of short of private road on S side with "No Hunting" sign; white trailer and cleared field at end of private drive
- 20 100 yds W of small pond on N
- 21 W edge of pond on S side of road
- 23 E end of marsh on N side of road just past Nelson's Camp road
- 27 Just before Kuskulana road to the N
- 28 W edge of Strelna Creek
- 29 W end of marsh on N side of road
- 33 Middle of Kuskulana bridge
- 40 Just beyond E edge of large marsh (Billy Lake marsh)
- 49 Middle of Chokosana Lake

Breeding Bird Survey
Slana Route Description

Stop

- 1 Road on southeast side of highway across from fuel tanks, before the "Porcupine Gifts" sign
- 3 Slana River on the east and a driveway on the west
- 4 At the beginning of a pullout on the E side of highway
- 5 Gravel cut bank on W
- 7 Just before a road on E side of highway (at culvert)
- 8 About 1/10 mile before mailboxes on both sides of road
- 9 Entry road to Carlson Creek (mile marker 68)
- 10 Pond on E side, steep drop off (pond not visible from highway). End of wide gravel pullout also to E
- 11 Road on E going up to bluff
- 12 Beginning of beautiful overlook to E, no pullout (mid-guard rail)
- 13 Just past mile marker 70.
- 14 Road on W. Marsh/Slana River on E.
- 15 Mile marker 71. Just past road on W.
- 16 1/10 mile before "Holmbe" mailbox on E
- 17 Mile marker 72
- 18 Over culvert, parallel road to W
- 19 Mile marker 73
- 21 Beginning of pullout on E overlooking low spot, meandering river, and swamp.
- 22 Across from small pond on W
- 23 Just before mile marker 75
- 24 Pullout on W, picnic tables
- 25 N side of bridge over Slana slough
- 26 N side of 2nd bridge over Slana River
- 27 Slana River W, sand bank (3rd one N) on E
- 28 Large meadow with Slana River running through on W side
- 30 Just after Mentasta lodge and just before mailboxes on E and road on W
- 31 Low spot in road, just before guard rail on both sides
- 32 Fifty yards N of a pole on the W side on the road and just before sign "Entering GMU 12"
- 33 Middle of guard rail
- 34 Middle of straight stretch, just N of series of gravel cut banks.
- 35 Culvert, 2/10 mile before Mentasta road sign
- 36 Mid way up rise in road, 0.1 mi before guard rail
- 37 ~Top of rise
- 38 Just before "Tok (40 miles) and Canada Border (136 miles)" sign
- 39 Between "S" turn on road
- 40 "Cramers" mailbox just after Bartel Creek and road on N and telephone pole on the S
- 41 Telephone pole with number 1385, just before mile marker 84
- 42 Telephone pole with number 1367
- 43 Telephone pole with number 1350
- 44 Telephone pole with number 1333
- 45 Telephone pole with number 1316

46 Telephone pole with number 1300
47 Telephone pole with number 1283, just before pond to the S
48 Telephone pole with number 1266
49 Telephone pole with number 1249
50 Telephone pole with number 1231

Appendix 2. Survey route descriptions for Off Road Point Count routes in Wrangell St Elias National Park and Preserve.

Each line should be run on a separate morning. Start time is 0400 hours. Both routes are done on foot. Observers should measure out an area 250 m long and practice pacing each year. There are 250 m between stops at May Creek and 500 m between stops at Chisana. Observers should also measure out 50 m to get more accurate distance estimates on birds (e.g. <50 m or >50 m).

MAY CREEK (250 meters between stops)

CHITITU TRAIL (MYC1)

Stop

- 1 Begin at the start of the Chititu trail located at the S end of the airstrip. The first stop is at the edge of the treed area (see map)
- 3 Between two bends in the trail
- 4 Upward slope right before a dip. Two fallen willows cover N (left) side of trail
- 5 Near top of steep hill, 20 feet past a slanting willow that stretches across the trail about 7 feet above the ground.
- 6 Before trail curves to the N (left). Mountain peak first comes into view - ground is level
- 7 On upward slope - before dirt turns to grass on path. There is only about 15 feet of vegetation to the N (left) before the hillside drops off sharply. Mountain in view to the N
- 8 Upward slope before road turns to the N (left). Forest drops off on the N and slopes upward on the S (right)
- 9 Level ground. Gravel opening to the N

DAN CREEK TRAIL (MYC2)

Stop

- 1 Begin at the start of the Dan Creek Trail just E of the main lodge. There are 3 trails, fairly close together, that run N into the Dan Creek Trail. Use the first of the 3 trails E of the lodge and the only one W of May Creek. In 1993, the showers building was located along this trail
- 2 Just past Al Gagnon's yard
- 5 At small wooden log crossing small creek
- 7 Between "S" bends
- 8 Bottom of hill just before corner
- 11 Twenty-five yards off the main trail, along an ATV trail which goes E next to the Nizina River
- 12 Just after washout in trail where the Nizina River undercut the trail. Someone has slashed a new snow machine trail going away from the river at this point

Blackpoll warblers were one of the most common birds along these

trails. Their song can sometimes be confused with a junco. Take time to do some reconnaissance and learn to identify their song if possible. Two blackpoll warbler territories are located near the stream (along the trail) closest to the rangers quarters. Orange-crowned warblers are also present on both trails.

CHISANA (500 meters between stops)

CHISANA TRAIL (CHS1)

This survey route is located southeast of the main airstrip and runs as far as Alder Lakes.

Stop

- 1 To get to the first stop, hike along the trail that runs parallel to the SE side of the air strip. Stop 1 is where the trail begins to turn NE (see map).
- 10 Just past middle of lake at NW end of long narrow lake below scree slope. First lake N of Red Hill Creek

Hike around to the east side of the lake and continue the survey. You will see the trail as it continues on the southeast.

- 11 E end of small pond just where it begins to curve N.
- 12 Located at the NE end of the 2nd to the last lake in the Alder Lake series (about 50 yards from the E end of the lake)

GOLD HILL (CHS2)

Stop

- 1 NE end of chicken airstrip near old sled.
- 2 Far SW end of airstrip and down hill to wood marker.
- 3 Just after trail joins creek and in a small gully. High cut bank to the N, creek to the left
- 4 Near crest of ridge just coming out of creek bottom, just before dropping down again
- 5 Just after crossing creek again. Stop is noisy so moved it 40 paces up the hill to the S
- 6 Crest of next steep ridge after coming out of creek bottom
- 7 Not quite to the crest of a ridge, still overlooking Gold Run
- 8 N facing slope. Just about to the crest of false summit
- 9 Facing NE, about 500 m from summit of tallest hill. Chicken airstrip visible
- 10 Nearly to crest of hill
- 11 Trail starts down the other side of hill. Facing W looking over the Chisana River
- 12 Looking down into Big "L".

Appendix 4. Birds recorded along BBS and off road survey routes
in Wrangell - St. Elias National Park and Preserve.

Slana

Trumpeter Swan
Canada Goose
Green-winged Teal
Mallard
Shoveler
Widgeon
Lesser Scaup
Scaup
Bufflehead
Red-tailed Hawk
Merlin
Lesser Yellowlegs
Spotted Sandpiper
Common Snipe
Red-necked Phalarope
Bonapartes Gull
Mew Gull
Herring Gull
Gull
Arctic Tern
Great-horned Owl
Woodpecker
Olive-sided Flycatcher
Alder Flycatcher
Tree Swallow
Barn Swallow
Gray Jay
Black-billed Magpie
Common Raven
Boreal Chickadee
Ruby-crowned Kinglet
Gray-cheeked Thrush
Swainsons Thrush
Varied Thrush
American Robin
Orange-crowned Warbler
Myrtle Warbler
Northern Waterthrush
Savannah Sparrow
Fox Sparrow
Lincolns Sparrow
White-crowned Sparrow
Slate-colored Junco
Red-winged Blackbird
Rusty Blackbird
Common Redpoll

Nabesna Rd

Pacific Loon
Horned Grebe
Trumpeter Swan
Mallard
Northern Pintail
Northern Shoveler
American Widgeon
Greater Scaup
Lesser Scaup
Scaup
Barrows Goldeneye
Bufflehead
Red-tailed Hawk
Golden Eagle
Merlin
Willow Ptarmigan
Lesser Yellowlegs
Upland Sandpiper
Common Snipe
Mew Gull
Herring Gull
Gull
Arctic Tern
Great-horned Owl
Northern Hawk Owl
Short-eared Owl
Belted Kingfisher
Downy Woodpecker
Hairy Woodpecker
Yellow-shafted Flicker
Woodpecker
Olive-sided Flycatcher
Alder Flycatcher
Tree Swallow
Gray Jay
Black-billed Magpie
Common Raven
Black-capped Chickadee
Boreal Chickadee
Chickadee
Red-breasted Nuthatch
American Dipper
Ruby-crowned Kinglet
Gray-cheeked Thrush
Swainsons Thrush
Hermit Thrush
Varied Thrush
American Robin
Bohemian Waxwing
Orange-crowned Warbler
Yellow Warbler

Myrtle Warbler
Blackpoll Warbler
Wilsons Warbler
Northern Waterthrush
American Tree Sparrow
Savannah Sparrow
Fox Sparrow
Song Sparrow?
Lincolns Sparrow
White-crowned Sparrow
Slate-colored Junco
White-winged Crossbill
Pine Grosbeak
Common Redpoll
Pine Siskin

McCarthy Rd E

Pacific Loon
Common Loon
Red-throated Loon
Horned Grebe
Red-Necked Grebe
Trumpeter Swan
Green-winged Teal
Mallard
American Widgeon
Greater Scaup
Lesser Scaup
White-winged Scoter
Common Goldeneye
Barrows Goldeneye
Bufflehead
Bald Eagle
Northern Goshawk
Willow Ptarmigan
Greater Yellowlegs
Lesser Yellowlegs
Wandering Tattler
Common Snipe
Red-necked Phalarope
Bonaparte's Gull
Mew Gull
Arctic Tern
Great-horned Owl
Belted Kingfisher
Downy Woodpecker
Hairy Woodpecker
Olive-sided Flycatcher
Alder Flycatcher
Say's Phoebe
Tree Swallow
Violet-green Swallow
Gray Jay
Common Raven
Black-capped Chickadee
Boreal Chickadee
Winter Wren?
Townsend's Solitaire
Swainson's Thrush
Hermit Thrush
Varied Thrush
American Robin
Bohemian Waxwing
Orange-crowned Warbler
Yellow Warbler
Myrtle Warbler
Blackpoll Warbler
Wilson's Warbler
Northern Waterthrush

Savannah Sparrow
Song Sparrow?
Golden-crowned Sparrow
White-crowned Sparrow
Slate-colored Junco
Pine Grosbeak
Rusty Blackbird
Common Redpoll
Pine Siskin

McCarthy Rd W

Pacific Loon
Common Loon
Trumpeter Swan
Green-winged Teal
Mallard
Ring-Necked Duck
Greater Scaup
Lesser Scaup
Barrows Goldeneye
Bald Eagle
Red-tailed Hawk
Greater Yellowlegs
Lesser Yellowlegs
Common Snipe
Bonapartes Gull
Mew Gull
Herring Gull
Glaucous-winged Gull
Arctic Tern
Great-horned Owl
Belted Kingfisher
Hairy Woodpecker
Downy Woodpecker
Three-toed Woodpecker
Olive-sided Flycatcher
Western Wood Peewee
Alder Flycatcher
Says Phoebe
Violet-green Swallow
Gray Jay
Black-billed Magpie
Common Raven
Black-capped Chickadee
Boreal Chickadee
Red-breasted Nuthatch
Golden-crowned Kinglet
Ruby-crowned Kinglet
Gray-cheeked Thrush
Swainsons Thrush
Hermit Thrush
Varied Thrush
American Robin
Bohemian Waxwing
Tennessee Warbler
Orange-crowned Warbler
Myrtle Warbler
Blackpoll Warbler
Wilsons Warbler
Northern Waterthrush
Savannah Sparrow
Fox Sparrow

Lincolns Sparrow
White-crowned Sparrow
Slate-colored Junco
Rusty Blackbird
Pine Grosbeak
White-winged Crossbill
Common Redpoll

May Creek 1

WEWP Western Wood Peewee
GRJA Gray Jay
CORA Common Raven
RBNU Red-breasted Nuthatch
BCCH Black-capped Chickadee
BOCH Boreal Chickadee
SWTH Swainsons Thrush
VATH Varied Thrush
AMRO American Robin
OCWA Orange-crowned Warbler
YWAR Yellow Warbler
MYRW Myrtle Warbler
BLPW Blackpoll Warbler
WCSP White-crowned Sparrow
SCJU Slate-colored Junco
PIGR Pine Grosbeak
WWCR White-winged Crossbill
CORE Common Redpoll

May Creek 2

LEYE Lesser Yellowlegs
SPSA Spotted Sandpiper
BEKI Belted Kingfisher
HAWO Hairy Woodpecker
OSFL Olive-sided Flycatcher
ALFL Alder Flycatcher
GRJA Gray Jay
BOCH Boreal Chickadee
RBNU Red-breasted Nuthatch
WEWP Western Wood Pewee
RCKI Ruby-crowned Kinglet
BASW Bank Swallow
SWTH Swainsons Thrush
HETH Hermit Thrush
VATH Varied Thrush
AMRO American Robin
OCWA Orange-crowned Warbler
YWAR Yellow Warbler
MYWA Myrtle Warbler
BLPW Blackpoll Warbler
NOWA Northern Waterthrush
WCSP White-crowned Sparrow
SCJU Slate-colored Junco
WWCR White-winged Crossbill
CORE Common Redpoll

Chisana

GRSC Greater Scaup
COGO Common Goldeneye
BUFF Bufflehead
LEYE Lesser yellowlegs
BOGU Bonapartes Gull
MEGU Mew Gull
HAWO Hairy Woodpecker
NOFL Yellow-shafted Flicker
OSFL Olive-sided Flycatcher
ALFL Alder Flycatcher
GRJA Gray Jay
BOCH Boreal Chickadee
RCKI Ruby-crowned Kinglet
SWTH Swainsons Thrush
VATH Varied Thrush
AMRO American Robin
YWAR Yellow Warbler
MYWA Myrtle Warbler
NOWA Northern Waterthrush
ATSP American Tree Sparrow
FOSP Fox Sparrow
WCSP White-crowned Sparrow
SCJU Slate-colored Junco
WWCR White-winged Crossbill
CORE Common Redpoll

Gold Hill

AMGP American Golden Plover
UPSA Upland Sandpiper
COSN Common Snipe
GOEA Golden Eagle
HOLA Horned Lark
CORA Common Raven
AMRO American Robin
WIWA Wilsons Warbler
ATSP American Tree Sparrow
SAVS Savannah Sparrow
WCSP White-crowned Sparrow
SMLO Smiths Longspur
CORE Common Redpoll

Preliminary checklist for the Yakutat area 10/8/96

SPECIES	STATUS	BREEDS	
Red-throated Loon	R	b	STATUS
Pacific Loon	M,W		M = spring or fall migrant
Common Loon	R	b	R = resident all year
Yellow-billed Loon	M,W,S		S = summer resident
Horned Grebe	M,S	b	V = vagrant
Red-necked Grebe	M,W		W = winter resident
Black-footed Albatross	S		
Northern Fulmar	S		BREEDS
Sooty Shearwater	S		B = common breeder
Fork-tailed Storm-Petrel	S		b = breeds in small numbers
Double-crested Cormorant	R	B	
Pelagic Cormorant	R	B	
Great Blue Heron	R	B	
Tundra Swan	M		
Trumpeter Swan	S,M	B	
Greater White-fronted Goose	M		
Snow Goose	M		
Emperor Goose	V		
Brant	M		
Canada Goose	M		
Green-winged Teal	S,M	B	
Mallard	R	B	
Northern Pintail	S,M	B	
Blue-winged Teal	M		
Northern Shoveler	S,M	B	
Gadwall	M		
Eurasian Wigeon	M,S		
American Wigeon	M,S	B	
Canvasback	M		
Redhead	M		
Ring-necked Duck	M		
Greater Scaup	M,W		
Lesser Scaup	M		
Harlequin Duck	R	B	
Oldsquaw	M,W		
Black Scoter	M,S		
Surf Scoter	R	b	
White-winged Scoter	R	b	
Common Goldeneye	M		
Barrow's Goldeneye	R	B	

Preliminary checklist for the Yakutat area 10/8/96

SPECIES	STATUS	BREEDS
-----	-----	-----
Bufflehead	M,R	b
Hooded Merganser	S	b
Common Merganser	R	B
Red-breasted Merganser	R	B
Osprey	R	b
Bald Eagle	R	B
Northern Harrier	M,S	B
Sharp-shinned Hawk	R	B
Northern Goshawk	R	B
Red-tailed Hawk	M,S	B
Rough-legged Hawk	M	
Golden Eagle	S	B
American Kestrel	M	
Merlin	S,M	b
Peregrine Falcon	S,M	B
Willow Ptarmigan	R	B
Rock Ptarmigan	R	B
American Coot	V	
Sandhill Crane	M	
Black-bellied Plover	M	
American Golden-Plover	M	
Pacific Golden-Plover	M	
Semipalmated Plover	S	B
Killdeer	M	
Black Oystercatcher	R	B
Greater Yellowlegs	S,M	B
Lesser Yellowlegs	S,M	B
Solitary Sandpiper	M	
Wandering Tattler	M	
Spotted Sandpiper	S	B
Whimbrel	M	
Hudsonian Godwit	M	
Marbled Godwit	M	
Ruddy Turnstone	M	
Black Turnstone	M	
Surfbird	M	
Red Knot	M	
Sanderling	M	
Semipalmated Sandpiper	M	
Western Sandpiper	M	

Preliminary checklist for the Yakutat area 10/8/96

SPECIES	STATUS	BREEDS
Least Sandpiper	M,S	B
Baird's Sandpiper	M	
Pectoral Sandpiper	M	
Rock Sandpiper	M,W	
Dunlin	M	
Short-billed Dowitcher	M,S	B
Long-billed Dowitcher	M	
Common Snipe	M,S	B
Red-necked Phalarope	M,S	B
Red Phalarope	M	
Pomarine Jaeger	M	
Parasitic Jaeger	M,S	b
Long-tailed Jaeger	M	
Bonaparte's Gull	S,M	B
Mew Gull	R	B
California Gull	V	
Herring Gull	R	B
Thayer's Gull	M	
Glaucous-winged Gull	R	B
Glaucous Gull	M,W	
Black-legged Kittiwake	S,M	B
Sabine's Gull	M	
Caspian Tern	M	
Arctic Tern	S	B
Aleutian Tern	S	B
Common Murre	M,S	
Pigeon Guillemot	R	B
Marbled Murrelet	R	B
Kittlitz's Murrelet	R	B
Rhinoceros Auklet	S	
Tufted Puffin	R	B
Mourning Dove	V	
Western Screech-Owl	R	B
Great Horned Owl	R	B
Northern Hawk Owl	M	
Northern Pygmy-Owl	R	b
Great Gray Owl	R	b
Short-eared Owl	S	B
Northern Saw-whet Owl	R	B
Common Nighthawk	V	

Preliminary checklist for the Yakutat area 10/8/96

SPECIES	STATUS	BREEDS
Rufous Hummingbird	S	B
Belted Kingfisher	R	B
Red-breasted Sapsucker	S	B
Downy Woodpecker	R	B
Hairy Woodpecker	R	B
Northern Flicker	M	
Olive-sided Flycatcher	M	
Yellow-bellied Flycatcher	V	
Alder Flycatcher	S	B
Pacific-slope Flycatcher	S	B
Horned Lark	M	
Tree Swallow	S	B
Violet-green Swallow	S	B
Bank Swallow	S	B
Cliff Swallow	S	B
Barn Swallow	S	B
Steller's Jay	R	B
Black-billed Magpie	R	B
Northwestern Crow	R	B
Common Raven	R	B
Black-capped Chickadee	M,W	
Chestnut-backed Chickadee	R	B
Red-breasted Nuthatch	M,S	B
Brown Creeper	R	B
Winter Wren	R	B
American Dipper	R	B
Golden-crowned Kinglet	S,M	B
Ruby-crowned Kinglet	S,M	B
Gray-cheeked Thrush	S	B
Swainson's Thrush	S	B
Hermit Thrush	S,M	B
American Robin	S,M	B
Varied Thrush	S,M	B
American Pipit	M,S	B
Bohemian Waxwing	M	
Northern Shrike	M	
European Starling	V	
Warbling Vireo	V	
Tennessee Warbler	V	
Orange-crowned Warbler	M,S	B

Preliminary checklist for the Yakutat area 10/8/96

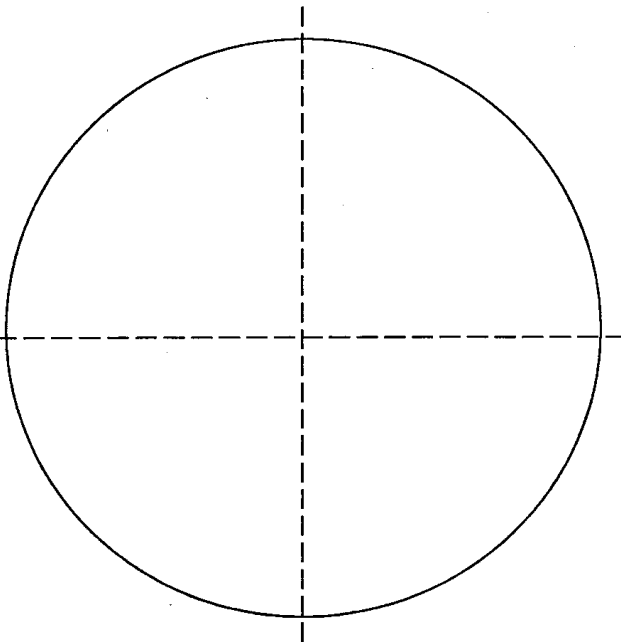
SPECIES	STATUS	BREEDS
-----	-----	-----
Yellow Warbler	M,S	B
Yellow-rumped Warbler	S,M	B
Townsend's Warbler	M	
Northern Waterthrush	M	
Common Yellowthroat	S	B
Wilson's Warbler	M,S	B
American Tree Sparrow	M	
Chipping Sparrow	M	
Savannah Sparrow	S,M	B
Fox Sparrow	S,M	B
Song Sparrow	M,S	B
Lincoln's Sparrow	M,S	B
Swamp Sparrow		
Golden-crowned Sparrow	M,S	B
White-crowned Sparrow	M,S	B
Dark-eyed Junco	S,M	B
Lapland Longspur	M	
Snow Bunting	M	
Red-winged Blackbird	S	b
Rusty Blackbird	S	B
Common Grackle	V	
Brown-headed Cowbird	V	
Pine Grosbeak	R	B
Red Crossbill	M,S	B?
White-winged Crossbill	M	B?
Common Redpoll	M	B?
Pine Siskin	R	B

[illegible]

Point #

Time start
(24 hour)

Direction



Notes:

Birds associated with the census area

[illegible]

Birds flying over the census area

[illegible]

p

Point # _____ Elevation (m) _____ Aspect _____ Slope _____

Lat: ° ' " N Long: ° ' " W

Water: ☐ None ☐ Stream/river ☐ Pond/lake ☐ Ephemeral

Disturbance: ☐ Fire ☐ Logging ☐ Wind ☐ Other _____

Habitat # _____ of _____ % of 50-m circle _____ Photo roll: _____ Frame: _____

TREE canopy cover (> 3m): ☐ 0 ☐ 1-9 ☐ 10-24 ☐ 25-59 ☐ ≥60%

% coniferous: ☐ <10% ☐ 10-25 ☐ 26-74 ☐ 75-89 ☐ ≥90%

TREE LAYER species Avg. ht.: 3-5 5-9 9-21 >21m

1. _____

2. _____

3. _____

4. _____

DWARF tree or SAPLING (< 3m): Total cover < 10%? ☐ Yes ☐ No

Layer	Avg. ht. (m)	% cover			Species (list)	
		0	1-9	10-24	25-59	≥60%
1.						
2.						

SHRUB LAYERS (< 3m): Total cover < 25%? ☐ Yes ☐ No

Layer	Avg. ht. (m)	% cover			Species (list for each layer)
		<25	25-74	≥75%	
1.					
2.					
3.					
4.					

HERB LAYER:

Graminoids			
Herbs			
Ferns			
Horsetails			
MOSS/LICHEN:			
Mosses/liverworts			
Lichens			
Litter			
Bare ground/rauis			

SOIL: ☐ Periodically tidal ☐ Wet ☐ Moist ☐ Well-drained, dry

CLASSIFICATION: _____ Vascular: _____ Kessel: _____