Joint Meeting of Boreal Partners in Flight (Alaska) and Partners in Flight British Columbia/Yukon Territory

October 8-9th 2002, Whitehorse, Yukon

AGENDA

Tuesday, October 8th: 1:00 – 5:15 pm

1:00 Welcome, logistics and general objectives of meeting. *Ilia Hartasanchez, Ducks Unlimited.*

1:10 Common conservation priorities and issues for landbirds in Alaska, British Columbia, and the Yukon Territory. *Shawna Pelech, Canadian Wildlife Service-British Columbia, and Steve Matsuoka, U.S. Fish and Wildlife Service.*

1:30 Addressing common issues: evaluating the first ten years of the Monitoring Avian Productivity and Survivorship Program in Alaska and adjacent Canada. *David DeSante, Institute for Bird Populations.*

1:50 An overview of environmental risk assessments and ecosystem based management planning for the North Coast Land and Resource Management Plan. *Sarma Liepins, BC Ministry of Sustainable Resource Management.*

2:10 Landbirds in North-western Forests: perspectives on continental importance, and wintering grounds. *Peter Blancher, Bird Studies Canada.*

2:30 Western Boreal Forest Initiative. *Eric Butterworth, Ducks Unlimited.*

2:50 Break

Session 1: Understanding effects of forest management on avian communities. Moderator: *Pam Sinclair.*

3:10 Introduction and objectives. *Pam Sinclair, Canadian Wildlife Service-Yukon.*

3:20 Accommodating birds in managed coniferous forests of North America: a review of bird-forestry relationships. *Rex Sallabanks, Idaho Department of Fish and Game.*

3:40 The ecology of landbird communities in undisturbed forests in southeast Alaska: a synthesis of 10 years of research results. *Mary Willson, University of Alaska Fairbanks.*

4:00 Structure of avian communities in forested beach buffers in southeast Alaska: effects of buffer width. *Michelle Kissling, U.S. Fish and Wildlife Service.*

4:20 Nesting ecology of boreal forest birds relative to a massive outbreak of spruce beetle in Alaska. *Steve Matsuoka, U.S. Fish and Wildlife Service and Colleen Handel, U.S. Geological Survey*.

4:40 Forest management practices and boreal birds in Northeastern BC. *Mark Phinney, Louisiana Pacific Canada Ltd.*

5:00 Wrap Up. *Ilia Hartasanchez, Ducks Unlimited.*

Wednesday, October 9th: 8:00am – 5:30pm

Session 2: Integration of Avian Conservation into Forest Planning and Practices: Successes and Challenges. Moderator: *Steve Matsuoka.*

8:00 Introduction and objectives. *Steve Matsuoka, U.S. Fish and Wildlife Service.*

8:10 Managing for goshawks. *Frank Doyle, Wildlife Dynamics Consulting.*

8:30 Landbirds and their role in Weyerhaeuser's Adaptive Management and Monitoring Program for the BC Coast. *Glen Dunsworth, Weyerhaeuser British Columbia.*

8:50 A Forest Ecosystem Network for Southeast Yukon. *Mike Gill, Canadian Wildlife Service-Yukon.*

9:10 Changing policies of forest management and the conservation of wildlife species on the Tongass National Forest: past, present, and future. *Gene DeGayner, USDA Forest Service-Tongass National Forest.*

9:30 Break

9:50 Working Session: Integration of avian conservation into forest planning and practices. Moderator: Bob Altman, American Bird Conservancy.
Discussion regarding:
1) Identifying the highest priority research and monitoring needs for landbirds in relation to forest management of coastal and boreal forests.
2) How to best to work with industry and forest managers to get landbird needs included in forest management. Who are the best people to work with (e.g. directly with industry, land-use planning process, certification)? What is the best way to transfer information?
3) Formation of a working group to develop joint conservation plans and proposals for BC, Yukon and Alaska.

12:00 Lunch

Session 3: Cumulative Effects of Resource Management on Landbird Populations. Moderator: *Shawna Pelech*

1:00 Introduction and objectives. *Shawna Pelech, Canadian Wildlife Service-British Columbia.*

1:10 On a wing and a prayer? Forecasting the future of boreal bird populations in Alberta forests. *Fiona Schmiegelow, University of Alberta.*

1:30 Effects of forest dissection by linear features on boreal forest bird communities: Issues of scale. *Erin Bayne, University of Alberta.*

1:50 Overview of development pressures and related conservation issues in north-eastern BC: approaches within the Muskwa-Kechika Management Area and beyond. *Pierre Johnstone, BC Ministry of Water, Land and Air Protection.*

2:10 The importance of managing riparian habitats for landbirds along the trans-mountain river corridors of southeast Alaska. *Jim Johnson, Utah State University.*

2:30 Break.

2:50 Working session: Assessing cumulative effects of resource extraction on landbirds: Identifying and filling knowledge gaps. Moderator: *Shawna Pelech.*
Discussion regarding:
1) How are (or are) cumulative effects being addressed in the Alaska, BC, or Yukon?
2) What is the best way to get landbirds incorporated into cumulative effects assessments? Who are the best people to work with (e.g. directly with industries, regulatory agencies)? What is the best way to transfer information?
3) Developing disturbance thresholds for landbirds: Can we use existing information? Which data gaps are most important to fill now?

4:30 Summary session: How Alaska, BC and Yukon can work together. Moderator: *Bob Altman.*

5:15 Wrap up. *Ilia Hartasanchez.*

6:30 Banquet at the High Country Inn.

SUMMARY AND MINUTES

Wednesday, October 9th

9:50 Working Session: Integration of avian conservation into forest planning and practices.
Moderator: Bob Altman, American Bird Conservancy

Summary of items discussed

- *Suggestions for researchers*.—There is a general need to get information to managers as soon as possible so that it can be incorporated into the land use planning process. The scientific literature has been the standard; however, we should also use the grey literature to get finding out more quickly. There is a need to disseminate general information on habitat use and natural history requirements to help develop common sense recommendations for forestry management—we can't wait forever for researchers to conduct the defining studies. Use adaptive monitoring whenever possible.
- *Major information needs*.—We need to improve predictive models of bird-habitat relationships to better identify the important structural components of habitat and to incorporate measures of fitness (nest success, survivorship) to help provide insight into the mechanisms governing avian responses to habitat manipulations. We also need better guidelines for second-growth management and species appropriate monitoring to assess the effectiveness of various forestry prescriptions.
- *Working with forest managers*.—In this arena we need to keep it simple while making sure our conservation priorities line up with the business reality. We have a better chance of influencing conservation in the private sector with face to face communication with industry reps and foresters. Working through the planning processes and peer and environmental pressure can also be effective.
- *Agencies and public land*.—Develop public and political pressure by educating the public to cause change in planning in the agencies. In this arena we need to be engaged in the planning process. NGOs may be able to play a large role in helping agencies meet their mission.
- *Potential for products*.—Guides for best management practices and training programs and simplified field guides for foresters.

Minutes

B. Altman: Are there products PIF can put together that would be beneficial? For e.g., a land managers guide to providing bird conservation in early-mid seral stage habitats. Is a product like this beneficial?

F. Schmiegelow: There are some products like this available in industry—referred to as best practice guides: here are the best practices we can use on the ground to give us the best conservation gains. They are for ecosystems, not for specific birds.

B. Altman: The value of this concept is a useful tool.

K. DeGroot: A lot of PIF bird conservation plans have these elements in them: focal species that represent different elements on the landscape. We need to know if you would prefer to have a predictive modeling tool, or something else that could be used more quickly.

B. Altman: This brings up the point of: keep it simple—developing plans foresters and silviculturalists can put into effect immediately. Value of predictive modeling.

G. Dunsworth: In regards to the guide: my experience is that the guide is no good unless you do training, which may have to happen a few times. Having real models for birds is what foresters need. Knowing what a particular bird nest looks like when creating a habitat patch is what comes out in the training.

J. Pojar: Foresters are the real agents of change, which has been my experience in the last 25 years. Unfortunately, in BC there is a missing generation of biologists. There is no one between the ages of 30 and 50 who is hired by the government. Are there any opportunities for masters

students, or more experienced bird biologists to participate in some kind of fellowship program? Trial by fire.

M. Willson: There was a recent workshop at the ESA (?) about the connection between research and conservation. Might be worth looking at what came out of that.

P. Meyers?: Industry and some other organizations in the lower 48 have had a series of discussions about characterizing biodiversity—take this further and develop standards. Try to work within a global certification realm, try to characterize it so that companies know how to target certification.

G. Baluss?: Talking to people on the ground that work for big companies pays off. Usually there a few people interested enough to continue to educate others. Putting out the effort to talk with people really works.

M. Willson: From the point of view of a researcher, who's used to publishing, I think it is important to get literature out to the general public. However, it is not the most effective method. More direct contact and training people is far more effective, because we just don't have time to do the research and get the publications out there.

R. Sallabanks: How many of us really go out with the people who are manipulating the habitat? They are very open to change, this in my experience. In showing these people the birds out there, they develop a deeper appreciation for the landscape. A few years ago a questionnaire was sent out to private industry managers in the Pacific Northwest asking what they want to happen. It was simple recipes that they wanted—the grey literature.

C. Francis: I agree with you, but the value of primary literature is its permanency. The number of studies that have replicated others, because of being published in the grey literature, is phenomenal. There is a need to publish in both. The conservationist's role may be to interpret what is coming from the research scientists. Research done by industry must get into the primary literature.

B. Altman: We still need to talk about transferring this information within the agencies. Particularly in Southeast AK. What are the best mechanisms?

? Speaker: If the people in the field are not able to produce the products people want, education is no good. By order of magnitude it makes this more difficult—must educate the public.

M. Gill: Efficiency is very important, and it bides us time, but ultimately, if we are increasing our throughput into goods we will be disappointed in the end, despite efficiency.

? Speaker (same speaker as before M. Gill): Agencies will do what they are told to do, but the public has the pull.

B. Altman: What about planning? Is there a mechanism for updating planning processes, other than through the public and political arena of making changes? Agency staff? Are bird conservation discussions happening at this level, and are they effective?

M. Kissling: We are all confined by the conditions of our agencies. In Southeast AK we have not been strong advocates with the Forest Service for migratory birds, because we don't have a body advocating for that in Souteast AK. I haven't had support within my own agency for this. We need people where the decisions are being made, in the Forest Service.

B. Altman: Is forcing agencies into addressing staffing issues a route to take? Bodies are always a problem in agencies.

G. Baluss?: We need agencies to pressure congress to enact migratory bird legislation. For funding reasons too.

M. Hahr: In AK there is more National Park land than anywhere in the lower 48. Over the last few years with PIF, there has been a missing parks presence. We need outside pressure to educate the public on bird conservation and the role of parks. Now there is a PIF representative from Parks.

M. Kissling: We are all part of agencies, but we are all individuals too. It is important to make sure supervisors are making long-term commitment to birds.

E. Campbell: We do a lot of planning. We plan at the forest level, the project level, and other levels, which takes a lot of time. It is extremely helpful when partners come in and offer support.

M. Heiman: Finding other places to get money, and forming new partnerships with nonprofits is important for partners in flight.

B. Altman: Good point. In CA, OR, and WA NRCS manages the farm bill—they don't have enough staff. Project submissions are stacked up because they don't have the personnel to process the paperwork. Point Reyes got funding from a foundation to run through NRCS to get proposals out, and get the money on the ground. Same thing happened in Oregon.

D. DeSante: The Forest Service has provided us with 10 years of funding—we've operated 36 MAPS stations in OR/WA for 10 years. We got another grant to develop landscape level relationships between productivity and these landscapes, and we have to match the Forest Service funding by 1:1 from private foundations. The foundations say they don't trust the Forest Service. They say they will give money to people who want to do litigation. The private sector has to be educated.

E. Campbell: It would be useful for PIF to coordinate…[rest lost in the tape switch]

D. DeSante: Find out if we want an abundance or productivity response from the birds. We need to gather and juggle a lot of information for the land manager—we need to get this information in the most cost effective way—MAPS. Some species will be missed, but this is a very cost effective method.

F. Doyle: The rate of cut in BC is very fast, and forests will be gone by 2015. Maybe we should use what we have to the best of our ability.

F. Schmiegelow: We have to think about the scale at which we are making our decisions. Local decisions made by individual agents are precluding more innovative approaches over a broader spatial extent. It is a value judgment to say that we will have a certain amount of habitat A by the year xxxx.

M. Willson: There are some points at which we can proceed without concrete data. E.g. snag data: provide cavities, but birds also need trees for foraging. We need to incorporate natural history information and common sense into plans, such as the basic need for birds to have nesting and foraging habitat—this shouldn't have to be documented.

B. Altman: We are primarily talking about non-listed species, which lessens the critical certainties we have when dealing with regulatory listed species. Adaptive management!

C. Francis: Monitoring is the key to make sure that we learn. When deciding how much to cut, monitoring must be in place to ensure that lessons are learned from year to year. Monitoring and plans must be developed at the same time. Monitoring must start now!

G. Dunsworth: Comparisons must be made—not only monitoring.

J. Pojar: My perspective is that if you want to influence tomorrow's decisions: use habitat models; use existing information (what Mary was saying); and use habitat models for certain species. It would be wise to monitor habitat as well as individual species. As part of a partnership, it would be wise for this group to develop a habitat classification that is meaningful for birds. Lastly, in BC the rate of cut is such that we cannot waste our time.

D. DeSante: We have already done classification. Management that takes place produces a habitat. It is critical to measure the variables that are there, and to characterize the habitat in terms of landscape variables. Relating bird responses to habitat variables is important, and then you can manage for the habitat variables. We will have more power this way, when doing multivariate analyses.

J. Pojar: I agree, as long as structural variables are included.

D. DeSante: Yes, especially when getting down to the stand level. We might not have all the answers, so we need to manage these forests in a way that will be time efficient and best for the birds.

E. Butterworth: We need to decide where we want to be in the next 25 years. We should take habitat data we have now, and build scenarios based on the path we are on today. This might tell us something about where the bottlenecks are.

J. Buchanan: I recognize that there are many species that we are missing information for. However, in many ways I think we have the information to manage right now. May want to figure out if we can compartmentalize our research and monitoring needs. Are we using the data we currently

have for improved management purposes? No. We have to make sure this research feeds directly into industry, etc.

B. Altman: Lets assume we have the models, and have done adaptive management. How do we transfer information to forest managers? Those of you from agencies, we'd like to hear from you.

M. Kissling: Modeling can be a very powerful tool for decision makers. I haven't seen it used at a higher level.

M. Phinney: If there is an opportunity in the early stages of land use planning, go this route. In areas where land use planning has already been done, talking to licensees is worthwhile—probably most worthwhile in the periodic planning states. In BC every couple of years the licensee has to update plans. Arm yourselves with good tools, such as models, because they get the point across. Proving how efforts like this can help achieve a certification goal is also a useful tool.

E. Butterworth: What kind of tools would you as a forester, want from a biologist? Other than predictive models. Are biological standards useful?

M. Phinney: Difficult for me to answer, because I am a biologist. I would say keep it simple and get to the point.

M. Gill: Must be able to make decisions about how much to take off the landscape. There are landscape stimulation tools to use, and we must bring existing bird information into tools like predictive modeling.

C. Francis: Saying which species will and won't benefit is the responsibility of the biologist, but it must be put into simpler terms when presented to the forester—integrate this for all species so that the foresters don't have to make decisions about which species to manage for. Recognizing the uncertainty of models is also important—adaptive management.

C. Beardmore: PIF continental plan will be coming out in the spring, which will have a priority species list in it.

J. Pojar: To accomplish change, I wouldn't bother with the government. They will always try to maintain the status quo. I would try to change industry, and sometimes the aboriginal people. I agree with Mark about the land use planning process, and engaging in it.

F. Doyle: We've used a single species approach with the goshawk, which has benefited other listed birds on the islands. The licensees we have approached with maps, and other types of info, are very interested in improving practices.

E. Butterworth: Picking indicators like moose and bird species that benefit from human activities, maybe aren't things that people in this room would like to see conserved [rest lost in tape switch].

2:50 Working Session: assessing cumulative effects of resource extraction on landbirds: identifying and filling knowledge gaps. Moderator: Shawna Pelech, Canadian Wildlife Service.

Summary of items discussed

- *Modeling consequences of development*.—Predictive models that describe the possible outcomes of land use on populations of animals are clearly needed by managers to quantify the trade-offs between conservation and different land use scenarios. These models can also be used to identify thresholds and targets for habitats and populations that help set meaningful goals and objectives to guide conservation activities.
- *Thresholds*.—Thresholds describe a habitat or population level where if crossed an ecological change occurs in a populations. Regarding habitats and birds we don't want to be near the threshold as this is the point where populations are approaching inviability.
- *Targets*.—Targets are desired levels of habitats or population size. The desired level is invariably much higher than the threshold level and should be within the normal range of variability for a viable population. Targets are useful in setting clear objectives for conservation in a planning area, however, they usually contain somewhat subjective elements that are based on economics and human values. Science needs to be used to develop targets for populations (i.e. predictive models) otherwise

the targets are too easily challenged. Targets should be set at the scale of the BCR or larger and are therefore useful to include in the PIF plans.

- *Role of science*.—The role of scientists is to provide information, not set policies. However, too often scientists are not at the table to help set a future vision of resource use. The current institutional structure does not reward scientists involvement in such meetings. Unless the later changes this role will rest most squarely on conservationists such as PIF coordinators.

Minutes

M. Willson: If we say how much we should remove from the landscape without disturbing anything, we are creating the same problem that fisheries created, because there is no buffer for some other unpredictable event. There must be a large error bar around the "sustainable yield."

F. Mueller: This group would be better qualified than any other group I know, to build that conservative value into that threshold. A manager can say, "there's the line" and say no.

C. Francis: I agree, but I don't think that we want to be anywhere near that line. We could argue that if 90% of the forest in Alberta were removed, we wouldn't lose more than 1 or 2 species of birds (never mind grizzly bears, etc.). We want to keep common birds common. We are qualified, but it is a value judgment between how many birds should we have and how much money we want from resource extraction. We need to provide the data, so that we can say, "if you do this, here are the consequences." We don't want to be anywhere near the extinction threshold.

A. Martell: That is the societal factor for the future scenario. What I like about these predictions is that we can say, "if the pace of this activity continues as it has, here is what you are going to forego." Putting forward a more environmentally sustainable scenario, given the practical situation, then we already have a current level of activity. I agree that society must make the future scenario, and then managers can use this as guidance.

F. Schmiegelow: We have been dealing with some of these scenarios in the forest industry: moving from a traditional 2 pass clear cut system to dispersed harvest with residual retention; reducing cut; and similar things with the energy sector. You can evaluate these in terms of predicted consequences, but you still haven't set a desired future goal in doing that, which is a different process. I am not really clear what "keeping common birds common" really means. Conceptually I understand, but what does it really mean: changing the community structure?

K. Hobson: I don't agree that scientists are not giving managers the right answers. Let's look at SE Yukon, where scientists have described the unique bird community. What more can be done? The developments that take place in that area will be based on unscientific outcomes of selected pressures. I don't know what else a person could say.

F. Mueller: Let's say 100 permits have been issued in SE Yukon. I know there are a lot of neat birds in this area; I've been there myself. I've got a mining application on my desk for that area. Does one more mine matter? Next day I have another permit, and I think that one more mine probably won't hurt. The political and economic forces are playing on that manager. It is very difficult to say yes or no.

M. Kissling: Many people making these decisions are basing them on very little. For example, when I see logging for a mixed forest, I immediately think of ovenbirds. Ovenbirds need large forested tracts of land. You can't just say, "we need to maintain biodiversity." You have to be more specific.

K. Hobson: Scientists can say what the minimum viable population would be for that situation. Scientists can say what they understand about certain systems, but how can you design science to deal with the day-to-day decisions of how many mines to approve?

F. Mueller: I think Fiona's approach of looking at different intensities of human activity, and using science to describe the different responses that take place across the landscape, is a very good approach. It elicits a response.

E. Butterworth: We are building those ecological relationships. It is a societal/economic decision of where we should be. For 100% scientific certainty, it is going to cost a lot of money. It is a two way street: if the scientists give a number, the regulators will say it is too high, and vice versa. It will have to be a feedback discussion to come up with a number that everyone is happy with.

S. Pelech: We'll have a few more comments on society and ecological thresholds. Then we can figure out how to come up with these thresholds.

C. Francis: With respect to the science: scientists don't set thresholds, they are curves. As a working hypothesis, lets say that by destroying 1% of the area, as a minimum, you've destroyed 1% of the wildlife. It's not true for everything, but for some species this is true. So a naturalist may say the line is way up high, and a miner might say the line is lower. No scientist can tell you where the line is. The other role of science is not just to say how much, but how. This is what adaptive management is about: how can I minimize the impact of taking out 3,000,000 board feet? The scientists can't decide how many board feet should be taken out, but can tell you what the repercussions might be, based on a model.

A. Martell: It is important to know who is at the table during that debate. Frequently, the scientists with the best information have been absent from the table where this societal decision is being made. The answer has been, "I'll tell you the curve, and I'll tell you how, but I'm too busy doing something else." Maybe this is why we have been let down. We need someone at these discussions to describe a scenario of a future vision. Scientists must be present while the decision is being made.

F. Schmiegelow: Having sat around the table quite a bit, it is extremely time consuming to do this. If we did this all of the time, we wouldn't be scientists anymore. The current institutional structure that many of us operate in, doesn't reward that involvement. There must be a change. We must continue publishing research and doing science; being on another committee can suck up a lot of time. If the public puts pressure on the government and others, saying, "we want you at the table" then those things will change. This is a complex social dynamic.

B. Altman: PIF should be the link between society and the scientists. I've written a lot of bird conservation plans, and sat through the same discussions. It was my role to go to these people with the science out there, because I couldn't bring them to the table. We have to come up with a number, because of all the management decisions being made all the time. The bird conservation plans are a result of the scientists, and whoever else, setting the stage for determining where the society threshold is. It is very important to put the plans out there.

F. Mueller: Right now the public still believes that we can have everything: wilderness; pristine environment; and clean water. But there are tradeoffs, and there are costs. You guys are in a better position than anyone else to explain these.

? (woman): Would it be useful to have safety thresholds per habitat?

F. Mueller: Thresholds are not new at all. You can compare it to speed limits, and air quality monitoring, which have been around for a long time.

C. Francis: I'm not sure it is the right context. We should be thinking, targets, which are different from thresholds. Speed limits are not thresholds, they are targets—no one drives the speed limit. For air pollution, no one wants more of it. We want a target for birds, because for any species other than endangered or rare, the threshold will be way below what we want it to be—its meaningless. We don't want black-throated blue warblers near extinction. This is what keeping them common means. How common and where the target is, is a value judgment. The scientists here can provide the information on which to base that, and it has to be a group effort. The target has to be mutually agreed upon.

S. Pelech: How is that target different from a safety threshold?

C. Francis: If you go below a threshold, something disastrous will happen. With targets, you want to keep them up there—its not that they will go extinct if you go below the target. We have decided the degree of commonness.

D. DeSante: A threshold to me is something where the slope changes. I think there is a place for thresholds. If you get below it, something different happens. Charles is saying that we are on a linear curve, and then we set a target on that curve. I agree that we need to be using the word target.

G. Dunsworth: Don't we need both for the people who need to decide between 2 target levels, or between different developments? People want to know what will happen if they cross below the target. How far can I go to get my extra school without getting close to the threshold? I don't think targets help anyone make choices; you must have both.

A. Martell: Isn't it a scale issue? If you're at the regional planning level, and out of this process comes a target, which is fitted with the possibility for other activities, it could be said that this kind of habitat condition will support this healthy population of birds. Wouldn't this work well for industry to then say, how can we achieve that? It should be flexible. We are looking at different ways to achieve targets, not different ways to keep from slipping below a variety of thresholds for different species. We must consider different methods of achieving a target. This is adaptive management!

G. Dunsworth: We are prepared to lose species in certain places.

C. Francis: Your objective should be relevant to the scale. Another analogy, which is a target not a threshold, is the Kyoto Accord. If Kyoto is ratified, it is generally agreed among scientists, that global warming will slow down, not be stopped. There is a real threshold here, and if it were down low enough, global warming would be stopped. If it does get ratified, the science starts coming in again—tradeoffs. It is an arbitrary target, and that has to happen.

F. Schmiegelow: If it is not well rationalized, in terms of objectives, then it becomes a very dangerous thing. Setting a 12% target for protected areas is not rational, and now we are stuck with that number. That was based on compromise: someone in Switzerland said that 4% is enough; and someone here said, "lets triple that." In setting a target, a person must be very explicit. Keeping common birds common is a little too fuzzy for me. If we want to stay within the natural range of variation, there has to be a temporal component too. As scientists, it is our responsibility to come up with a well-rationalized target; otherwise someone else's judgment is equal. It does become a societal decision, but we can provide the best ecological foundation on which to base this target.

P. Johnston: I agree that it is our role to give our best guess to the future condition and what it should be.

E. Butterworth: There are very explicit reasons why the targets that are chosen [rest of talk cutoff]

C. Handel: The political climate is such than heavy development is likely to occur on private corporate land. We know that these lands, and populations are going to change. Coming up with target populations, what do you use? If current figures are used, we know that won't hold. What is the best way to come up with number estimates in the face of all of this development?

F. Schmiegelow: A target population can be very vague term. It is whatever you set it to be.

C. Handel: As a more realistic paradigm, we could spell out the consequences of development, so that we know what will happen to a population.

F. Schmiegelow: That is what we've been talking about. It can be taken a step further by saying what the consequences will be if the population is reduced by x%. You need to be very specific in deciding what your objective is. What are you managing for, what are the values and attributes associated with landbirds? Keeping common birds common?

A. Martell: More practical targets relate more to habitat and habitat condition. If we define this, then we are also defining conditions for survival. It is not good enough to define the birds there. If there is a targeted condition factor, which makes it easier for the regulator. It gives industry rules, and encouragement to be innovative and to put the $ into development practices that are most cost effective—and still meets the goal. They are maybe more difficult to attain, but better for the long-term.

C. Handel: Regardless of setting a habitat goal/condition or population goal—if you set a range it will be taken down to the bottom.

A. Martell: In many cases, the question of determining a population level and condition is the responsibility of the scientists. This information must be translated into habitat and habitat condition. This is what Bob was talking about—get the plans out there.

S. Pelech: We've talked about targets, and Fiona and Erin's work in AB provides a good setting to talk about these targets many of us are uncomfortable with setting.

Holly: Inaudible

S. Pelech: I think you were referring to critical areas, like the SE Yukon region. It isn't easy to designate an area on the map for forest birds. So, to ask the panel: do we need broad scale monitoring over a range of landscapes, or how can we use existing information? Models?

F. Schmiegelow: If your target is a threshold, as a scientist, I can understand what a threshold might be for probability of population persistence. If it is something else, I'm not sure how I would go about it, other than setting an arbitrary population level and managing for that. If the goal is to maintain current levels, it won't matter what we do—anything we do will decrease them.

C. Francis: That is true in pristine areas. There is a theory in Ontario: management of the boreal forest can be done within something resembling a natural disturbance regime. If this is achieved, in the long-term, there may not necessarily be a net loss. Maybe thresholds do have to be set lower, like the national parks example: leave 12% alone, and we will also do the best with the rest. I don't see a way other then setting an arbitrary decision.

F. Schmiegelow: There are 2 different concepts: setting a population target based on current levels; and managing within the range of natural variation, particularly in forests, which are highly stochastic.

C. Francis: I'm thinking very large scale, in terms of targets. These targets should be set at the BCR level.

F. Schmiegelow: Setting targets at the BCR level is fine, but is not helpful for land managers. BCRs cross many jurisdictional boundaries.

C. Francis: That is the second step: if you don't have a plan at the BCR level, then it is hard to patch things together. Allowing a certain number of mines for example, would become a cost/benefit decision. Without a BCR wide target, you don't have anywhere to go.

F. Schmiegelow: I agree, and am not advocating a fine scale approach, but need to have some middle ground.

S. Pelech: Once a BCR-wide objective is set, links have to be made for the regional planners so the decisions can be made easier.

D. DeSante: As far as scale goes, I think it was a mistake to put management into the context of BCRs. Things happening in the environment are happening at a smaller scale—physiographic strata. Looking at BBS data and such, things make sense when you get down to this level.

A. Martell: This is the value of the BCRs—they are hierarchical. Whatever you have as habitat goals over a whole BCR, have to be stepped down to that level.

D. DeSante: I think we have to concentrate at the lower level.

J. Gauthier: Thresholds serve as rules, and the regulations help us live every day. Targets are subjective, and the decisions are difficult to live with. People will develop different targets, and in developing these, you can feel more comfortable living with your own value. People will respect that.

M. Norton: I agree with the habitat target idea, but are we moving towards setting targets in core areas, non-core areas? Is this feasible?

F. Schmiegelow: Those are defined explicitly to maintain viable populations of the focal species.

A. Martell: It goes from goals in the habitat conditions down to a conservation design. There are a variety of designs that can be applied on the landscape.

G. Dunsworth: Conservation designs…[inaudible]…

P. Johnston: The designs are the result of what you start with. In the peace area we are going with conservation area designs: development areas; management zones where everyone gets a piece; and protected areas. Inputting our value judgments determines how much of each there will be.

S. Pelech: Thanks everyone. Next is the summary session.

4:30 Summary Session: how Alaska, BC, and Yukon can work together. Moderator: Bob Altman, American Bird Conservancy.

Summary of items discussed

- *Conservation planning*.—Developing joint landbird conservation plans for the portions of BCR 4 & 5 shared by Yukon Territory, British Columbia, and Alaska.
- *Habitat selection models*.— Summarize information on habitat selection and life history requirements for landbirds shared by Yukon Territory, British Columbia, and Alaska into a useful format for forest managers. We would need a central repository for the data and a commitment from someone who could analyze and/or serve the data.
- *Using existing models*.—Test in BC and Yukon the utility of models developed in Alberta to assess the effects of forestry and oil and gas development on birds. Determine what data would need to be collected to do this.
- *Population connectivity*.—Breeding birds of northwestern North America have a distinctive stable-isotope signature from breeding population in the rest of the continent. This makes populations in the region well suited for linking breeding and wintering sites.
- *Working with resource managers and industry*.—Organize a PIF meeting focused on a particular type of land use (i.e. oil and gas) and invite participation from scientists, land managers, and industry reps. The NABCI Canada Council will be discussing a strategy for conservation of birds in the boreal forest this Fall during which reps from oil and gas and forestry will be on hand. Hopefully some headway will have been made on this front during this meeting. Certification of foresters should be used as a tool to promote sustainable forest management in the region. We could work through public and certification advisory groups to get birds incorporated into the certification process. The conservation plans will be a useful reference for such efforts.
- *Coordinating conservation among scientists, conservationists, and land* managers.—There is a need for a formalized exchange of information among researchers, state or regional landbird coordinators, people who use the information on the ground, and the biologists conducting effectiveness monitoring. This needs to operate in a feedback loop such that research is relevant to the needs of managers, land managers have access to the most current information, and information on the success or failure of various land management prescriptions is used to direct future research and management. A demonstration project could be developed to show how this loop operates.

Minutes

B. Altman: I would like to end this on a positive note, and come up with a wish list. We've talked about needs, and issues, and there are certain things that we can do—so lets talk about what we want to do and how we are going to do it. They could be strategies, actions, or projects that we want to do. As we go through this, lets think about integration and partnerships—things that can be done across jurisdictional and political boundaries, and that meet all of the criteria we have discussed.

I. Hartasanchez: There is potential for funding to go towards work in the boreal…inaudible…keep this in mind as we go through this.

B. Altman: Here is a summary of the forestry discussion we had earlier today—summarized into coarse level themes.

- Research and monitoring: need for information as soon as possible; need to use what we have; and adaptive monitoring.
- Major needs: bird habitat models; second growth management; structural features; fitness; mechanisms causing response; predictive modeling; and species appropriate monitoring.

- Working with forest managers: keep it simple; make sure conservation priorities line up with the business reality; better chance of making change in private sector with face to face communication; other change is through the planning processes; peer and environmental pressure can work.
- Agencies and public land: public and political pressure; educate the public to cause change in planning in the agencies; need to engage in the planning process; NGOs may be able to play a role in helping agencies meet their mission
- Potential for products: best management practices; and a land manager's guide.

B. Altman: So let's carry on with the discussion. Bird conservation plans have to be done. If plans are already done, perhaps there can be further development on habitat objectives.

S. Matsuoka: We've been talking about doing the later type of work in Southeast Alaska. This could possibly be done in cooperation with scientists from British Columbia.

B. Altman: There's a project right there: find partnerships and funding opportunities. This sounds like a very high priority project. Does anyone else have an idea for a cool project?

D. DeSante: Landscape specific survival and productivity models. Especially important to link this to management when it actually happens. Evaluate management while it is happening.

P. Johnston: Maybe some of the habitat work, from caribou work for instance, could be plugged into some of the bird models.

B. Altman: Start thinking about these suggestions, and if you would like to actually make them into projects, and who you might want to do that with.

S. Matsuoka: There has been a general sense that we need to summarize what we know about habitat associations and basic life history information that is useful for management. Maybe we can package this information into a useful format.

B. Altman: Products. Lets try to think of these ideas in terms of projects and products.

F. Mueller: What about a demonstration project for a case study where 1) thresholds are identified, and 2) thresholds are incorporated into residuals.

E. Butterworth: This does exist in Alberta…inaudible…

S. Pelech: What about using the information in AB, and testing these models in northern BC and the Yukon? Find out what other information needs to be collected.

M.Gill: If we are going to use these habitat models, we need to apply that to spatial data.

A. Martell: Rather than doing it on an individual basis, we need to have a platform, such as a library, where we can access distributed databases that currently exist, so all people can use it—it would be on the web.

C. Francis: There are two parts to this: 1) people who have the data, and 2) people with the technical expertise to make the data available.

B. Altman: I want to know if anyone is thinking about pursuing any of these ideas that are being discussed, or if someone from your agency might be interested. This is the next step in talking about these ideas.

K. Hobson: Dave alluded to the connectivity issue of the breeding and wintering grounds, which brings up the point that it is this Northwestern part of the continent that has very distinctive information on birds (?).

B. Altman: What about strategies to transfer this information along to forest managers?

J. Buchanan: With respect to the habitat models discussed earlier: are we talking about using current models for other species? If we do, would there be value in looking at the strategies waterfowl and mammal managers could use in a partnership? How do we utilize the partnership to protect caribou?

P. Johnston: Inaudible

J. Pojar: Inaudible…beyond that, the greenies are starting to shift to the interior in the boreal forest. Through partnerships with NGOs there could be big appropriation.

L. Christensen: What about inviting some oil and gas representatives to the next PIF meeting?

B. Altman: Maybe that could be the focus of one of the next PIF meetings. Focusing the theme on a particular land use, and inviting the people who are associated with that land use has happened in the past. I would throw that out as an idea for the next PIF meeting.

C. Francis: Back to the boreal: we could work involve people from right across Canada.

A. Martell: For the meeting in 2 weeks time, the NABCI Canada Council has set up an entire day devoted to discussions on boreal forest strategies, and what actions should be taken by all nature agencies involved with NABCI. There will be presentations on the knowledge we have of birds in the boreal that Pete Blancher has organized. Oil and gas will be there discussing their needs and expectations. The forest products association of Canada will be there on the forestry side. NABCI will be looking at ways to improve bird conservation across Canada. It is designed specifically for industry.

B. Altman: Sounds like an excellent opportunity. Is it open invitation?

A. Martell: It is always open, but it is designed as a council meeting, and some of the people here from the Canadian agencies should try to get the information shared at this meeting to that one. Pete will be using the information he picked up here too.

D. DeSante: I've been involved with sustainable forest management down in the States. Is there anything similar in Canada?

J. Pojar: …inaudible…there is some of that happening.

G. Dunsworth: Where that sits on the ground is in certification, which is being driven by public advisory groups, and others. They could really use your help in trying to incorporate birds into plans, because they don't understand.

D. DeSante: Inaudible

G. Dunsworth: One possible project would be to contact a CSA certification advisory group in your area, and advise them. They may not know much about PIF.

B. Altman: In the US, I've been approached to provide input for these bird targets, and it all comes back to completing the bird conservation plans. They are used in research and monitoring.

G. Dunsworth: Right now we are moving towards a results based code and effectiveness model. The problem comes in deciding how to monitor the birds that play a big role.

D. DeSante: I'm thinking more about feedback now. In a year we will see the relationship between landscape and productivity, from various parts of the country. How do these relationships feed back into these plans?

B. Altman: I see it as being done through provincial/state steering committees, BCR coordinators.

D. DeSante: The plans are given to the person who is deciding how many more mines should be approved. How does it get back to them? First drafts of these plans are best guesses.

B. Altman: Communication through partnerships should be another avenue for ensuring that the most current pieces of information are being used.

D. DeSante: Any time management takes a plan into consideration; it should be monitored with respect to how well it did. How does an organization like the forest service communicate adaptive management that has taken place?

B. Altman: We need to get back to the plan writer or the PIF chapter to make sure the loop is contained. Through published literature, and the PIF representative, information will work through the feedback loop.

D. DeSante: With respect to the demonstration project, is there a way to demonstrate that loop successfully? Is there something we can do in the boreal forest to really demonstrate how it works?

B. Altman: Probably not for the boreal forest, because there aren't any completed plans yet. Coastal regions do have plans. This could be a project. It is time to end.

ABSTRACTS

The abstracts are presented in the order in which the papers were presented. The text is largely unedited, except for formatting, as we felt the abstracts should be presented in their entirety.

ANALYSIS OF 10 YEARS (1992-2001) OF DATA FROM THE MONITORING AVIAN PRODUCTIVITY AND SURVIVORSHIP (MAPS) PROGRAM IN ALASKA AND WESTERN BOREAL CANADA. David F. DeSante, Danielle R. Kaschube, and T. Scott Sillett, The Institute for Bird Populations, P.O. Box 1346, Point Reyes Station, CA 94956-1346; Email: ddesante@birdpop.org.

For each of five target species (Hermit Thrush, Orange-crowned and Wilson's warblers, Fox Sparrow, and Dark-eyed Junco), we used a) modified Cormack-Jolly-Seber mark-recapture analyses (program MARK) to model apparent adult survival rates and recapture probabilities, and b) logistic regression to model productivity (proportion of young in the catch) after correcting for missed effort. Only four stations were operated for all 10 years while another four were operated for only one year; the mean number of years of operation/station was 5.73. We modeled time and geographic variation, and time and habitat variation, in survival and used Akaike's Information Criteria and model averaging. Recapture probabilities for all five species were best modeled as a function of sex ($QAIC_C$ weights varied form 1.00 to 0.45). We also found support for sex-specific survival for Orange-crowned Warbler ($QAIC_C$ weight = 0.49) and Dark-eyed Junco ($QAIC_C$ weight = 0.62). For Wilson's Warbler survival, we found very strong support for a positive linear trend ($QAIC_C$ weight = 1.00) and for spatial variation at the scale of five Alaska regions ($QAIC_C$ weight = 0.81). We found very little support for time variation ($QAIC_C$ weights from 0.26 to 0.12) or geographic variation ($QAIC_C$ weights from 0.17 to 0.05) in survival for the other four species, or habitat variation ($QAIC_C$ weights from 0.23 to 0.01) in survival for any of the five species. Despite the lack of support for models of geographic variation for four of the species, those models produced survival rates in the South-central Alaska Region (Anchorage area) that were lower than those in every other region for four of the species and only slightly higher than the lowest for Dark-eyed Junco. Significant temporal (year), spatial (at four spatial scales varying from the sub-region to the individual station), and habitat variation was found for productivity for all five species, with productivity in 1995, 1996, 1999, and 2000; in the Southeast and South-central Alaska regions; and in coniferous forest habitat often being significantly lower than in other years, regions and habitats. Productivity for Wilson's Warbler was significantly positively correlated with the El Niño/Southern Oscillation Precipitation Index (ESPI), such that higher productivity occurred during El Niño years.

AN OVERVIEW OF ENVIRONMENTAL RISK ASSESSMENTS AND ECOSYSTEM BASED MANAGEMENT PLANNING FOR THE NORTH COAST LAND AND RESOURCE MANAGEMENT PLAN (NCLRMP). Sarma Liepins, Ministry of Sustainable Resource Management, North Coast Forest District, 125 Market Place, Prince Rupert, BC, V8J 1B9; Email: Sarma.Liepins@gems1.gov.bc.ca

The goal of the NCLRMP is to enhance development of the planning area by balancing competing uses and sustaining environmental values in a manner that is consistent with both the principals of Ecosystem Based Management (EBM) and community vision. Delivered effectively, EBM will mean healthy functioning ecosystems, economies and communities. Environmental Risk Assessment (ERA) is one ecosystem component of EBM that will inform decision-makers. It is a technical process involving a team of experts which incorporates both temporal and spatial aspects in the assessment and reporting of changing environmental conditions. Assessments are underway for four selected environmental indicators: Coarse Filter Biodiversity, Marbled Murrelet, Mountain Goat, and Grizzly Bear. A fundamental assumption is that timber harvest, as presently practiced, is the primary agent of change that might put environmental values at risk. Much of the ERA is habitat driven and recognizes that humans are limited to managing things that can be defined (i.e. mapped inventories), counted, evaluated and monitored over time. The "Spatially Explicit Landscape Event Simulator" (SELES), is used to model

projected changes in forest condition from time 0 to time 250 years. The final estimation of risk is calculated using a "Bayesian Belief Network" that allows the combination of SELES outputs with documented data, expert opinion, and measures of certainty. Environmental risk can be assessed as a divergence from the mean and range of natural variability (RONV), with risk increasing as departure from RONV increases over time. Two important information sources complimenting the Coarse Filter Biodiversity ERA, are the watershed/landscape unit ranking process and the life forms list. The former is a tool that will identify those components of the landscape that are the most diverse, productive, and rare. The latter is a classification framework that lists wildlife species and assigns taxa to life form categories based on predominant patterns of habitat use.

ACCOMMODATING BIRDS IN MANAGED CONIFEROUS FORESTS OF NORTH AMERICA: A REVIEW OF BIRD-FORESTRY RELATIONSHIPS. Rex Sallabanks, Nongame and Endangered Wildlife Program, Idaho Department of Fish and Game, 600 S. Walnut, P.O. Box 25, Boise, Idaho 83707; E-mail: rsallaba@idfg.state.id.us.

Coniferous forests of North America provide important habitat for many bird species. Because approximately two-thirds of all forestland is currently managed for commodity extraction, however, an understanding of the relationships between birds and forestry practices is essential for effective conservation action. To meet this information need, I will synthesize results from previous studies of bird-forestry relationships conducted in managed forests across North America. Where possible, special reference will be made to Pacific coastal coniferous and boreal forests. The following "unifying principles" capture many of the results from my review: (1) Managed forests support rich, diverse bird communities; (2) Structural characteristics of forest stands are more important than age-class *per se*; (3) Forest management objectives can remain compatible with the needs of birds if a variety of habitat conditions are provided; (4) Many factors influence bird populations in managed forests; (5) Management approaches are complex; and (6) Involvement by private landowners (especially the forest products industry) is critical to the success of avian conservation efforts. I will expand upon these principles throughout my presentation, as well as make specific recommendations as to how forest managers might accommodate the habitat needs of birds.

ECOLOGY OF FOREST LANDBIRD COMMUNITIES IN SOUTHEAST ALASKA. Mary F. Willson, Willson Ecological Consulting and University of Alaska-Fairbanks; Email: mwillson@gci.net.

Comparisons of avian diversity and abundance in coniferous and deciduous stands in northern Southeast Alaska and adjacent Canada showed regional and annual differences. However, the understory community in deciduous stands was consistently more diverse and abundant than that in coniferous stands; this contrast was paralleled by a greater abundance of litter invertebrates, higher vegetation density, and greater nest safety in deciduous-forest understory. Some species near the edge of their geographic range occupied habitats different from those elsewhere. Success of understory nests was consistently greater in deciduous stands and away from forest edges. Common nest predators were red squirrels, corvids, and small mammals. Abundance of red squirrels was positively correlated with the density of large, cone-bearing Sitka spruces and negatively correlated with success of experimental nests. The coastal rainforest and some interior forests in northwestern North America are unusual in that they receive enormous annual influxes of nutrients from the sea, in the form of anadromous fishes. Foraging on locally abundant fish increases the breeding success of bald eagles and American dippers in Southeast Alaska. The density of breeding passerines appears to be higher on salmon streams than on streams reaches without salmon runs. Numerous management implications are noted, none of them new, but showing that Southeast Alaska need not reinvent some familiar principles.

RELATIONSHIPS BETWEEN WIDTH OF POST-LOGGING BEACH BUFFER STRIPS AND COMPOSITION OF FOREST BIRD COMMUNITIES OF SOUTHEAST ALASKA. Michelle L. Kissling, U.S. Fish and Wildlife Service, 3000 Vintage Blvd., Suite 201, Juneau, AK 99801; Email: michelle_kissling@fws.gov.

A 2-year study was initiated in 2001 to evaluate current forest beach buffer guidelines for landbirds in the Tongass National Forest (Tongass), Southeast Alaska. A beach buffer is a no-harvest zone, extending from mean high tide to a prescribed distance inland; this management technique is most often applied to riparian forests. Using a combination of the variable circular plot method and the double observer approach, point counts were conducted during the breeding season. The new survey technique estimates the probability of detection for each observer using mark-recapture theory, and then corrects each density estimate to remove relative observer bias. Averaging paired samples by independent observers increases precision of the density estimates. Using a stratified, random sampling design, point count stations (n = 391) were located systematically in forested beach buffers ranging from 5m – 500m in width.

Rarefaction curves were used to predict the average rate of accumulation with an increasing number of observations, standardizing the sampling effort across treatments. Results demonstrate that control sites have the greatest number of species, but only with a high number of observations, suggesting the presence of rare species. Clearcuts and narrow buffers were species-rich, most likely due to an edge effect and the overlapping of bird communities. Review of relative abundance curves suggests that clearcut sites have a high degree of evenness (E = 82.92), while control sites have the highest dominance (E = 67.18). Therefore, control sites contain a few dominant species and many species that are relatively uncommon. Relative abundance of forest-associated species increases as buffer width increases. Interestingly, forest birds are relatively common in clearcut sites, but clearcut-associated birds are nearly absent from forested sites. Several hypotheses have been proposed, but more analysis is needed to further understand this relationship.

In summary, buffer widths greater than 250m appear to maintain similar relative abundance of forest-associated species as that in control sites. Control sites have the highest species diversity, but only when sampling effort is intensive. The homogenous habitat in clearcuts supports high evenness of species, but is also species-rich. Given these preliminary results, forest managers on the Tongass should maintain current beach buffer prescriptions and consider management of second-growth within beach fringe forests where clearcut logging has already occurred. A final report detailing this project will be available in June 2003.

NESTING ECOLOGY OF BOREAL FOREST BIRDS FOLLOWING A MASSIVE OUTBREAK OF SPRUCE BEETLES. Steven M. Matsuoka[1] and Colleen M. Handel[2].
[1] U.S. Fish and Wildlife Service, Migratory Bird Management, 1011 E. Tudor Road, Anchorage, Alaska 99503; Email: steve_matsuoka@fws.gov.
[2] U.S. Geological Survey –Alaska Science Center, 1011 E. Tudor Road, Anchorage, AK 99503; Email: colleen_handel@usgs.gov.

We examined the nesting ecology of yellow-rumped warblers (*Dendroica coronata*) and dark-eyed juncos (*Junco hyemalis*) from 1997–1998 among forest with different levels of spruce (*Picea* sp.) mortality following a large outbreak of spruce beetles (*Dendroctonus rufipennis*) in the Copper River Basin, Alaska. For both species, the availability of habitat features that were selected for nesting in forests with low-to-moderate levels of disturbance were diminished in heavily disturbed stands. However, both warblers and juncos maintained viable rates of nest success (55% and 45% of nests fledging young respectively) under heavy disturbance. Yellow-rumped warblers nested exclusively in spruce but nest success did not vary with disturbance, presumably because birds altered their use of habitats. As disturbance increased, warblers switched from selecting nesting areas with high densities of medium-diameter white spruce (*Picea glauca*) to areas with high densities of beetle-killed spruce. Warblers also switched from nesting in live (80% of nests in areas with low-to-moderate disturbance) to beetle-killed (60% of nests in areas with high disturbance) spruce as levels of disturbance increased; however, nest survival was equivalent between nests in live and dead spruce. In contrast, most dark-eyed junco nests in forests with low disturbance were lost to predators. As a result, nest success of juncos breeding in forests with low disturbance (4% success) was lower than that of juncos nesting in moderate-to-heavily disturbed stands (45% success), possibly due to relatively high densities of red squirrels (*Tamiascurius hudsonicus*). Six of 13 species of spruce-nesting birds nested in beetle-killed spruce.

Because dead spruce may remain standing for 50 or more years in the Copper River Basin, salvage logging of beetle-killed conifers will eliminate viable nesting sites in the region and may disrupt the ability of spruce-nesting birds to sustain breeding populations until natural reforestation occurs.

MANAGING FOR GOSHAWKS. Frank Doyle, Wildlife Dynamics Consulting, Box 129, Telkwa, B.C., V0J 2X0; Email: doyle@bulkley.net.

The Goshawk is primarily a forest hawk, and it is found in forested regions throughout North America. Through much of its southern range natural forest succession has been replaced by harvest rotations, or forest has been converted permanently to farmland and the structures of urbanization. (In British Columbia for example, nearly 150 goshawk territories are known in 6 Forest Regions, and all have been impacted by harvesting.) However, as we change and manage the forest, we (collectively) still strive to balance our impacts by maintaining healthy and sustainable forest ecosystems. To do this for one of the forests top predators, the goshawk, we need to look at this species in the northern Boreal Forest where we can study this species in a pristine "control" environment. Work at Kluane Lake, Yukon (Krebs et al.) shows that goshawks are winter residents and that populations are linked to the availability of forest prey in winter. Available prey to goshawks, are those that are found in late seral-old growth forest landscapes, and range in size from woodpeckers – snowshoe hares and grouse. At the scale of a goshawk territory, what was previously identified as a key-limiting factor, the nest site, is secondary to the availability of its prey. Changes in the availability of prey (in this case the snowshoe hare cycle) changed the density of goshawk pairs, and the number of young they raised, within a landscape. In addition, pairs in a homogenous forest landscape are regularly spaced, and reuse traditional nest sites. The change in use of these traditional sites was such that when hares were abundant, pairs were spaced regularly every 3km and they raised 4 chicks each, as hares declined pairs declined to one every 6km with 1-3 chicks, and at the low in hare numbers no goshawks bred. The lesson from this work, are therefore the need to retain enough suitable late seral-old growth habitat (habitat in which goshawk successfully hunt), such that a health and viable goshawk populations is retained across the landscape. In addition, knowing what is the natural pattern of nest spacing in a landscape allows forest managers working with biologists to readily locate and monitor the health of the goshawk population. Lastly, the work in the Yukon and where ever goshawks have been studied in detail, also show that the weight and wingspan of birds in a landscape is individual to that landscape. As a manager therefore, when you are managing for goshawks, you are indeed managing for your goshawks.

FOREST MANAGEMENT PRACTICES AND BOREAL BIRDS IN NORTHEASTERN BC. Mark Phinney, Louisiana Pacific Canada, Ltd, 116 116th Ave., Dawson Creek, BC V1G 3C8, Email: mark.phinney@lpcorp.com.

Results from a recent study on bird response to partial harvesting were reviewed. Bird content of conventional clearcuts was compared to that of 'retention' blocks and uncut forest. Total and mean number of bird species and individuals was significantly lower in clearcuts and similar in retention blocks and uncut forest, but species composition varied by block type. Numerous bird species exhibited a preference or avoidance of a particular block type. As well, numerous in-block habitat types were selected by bird species. Most habitats distinct from the surrounding continuum (e.g. residual structure in cutblocks, openings in forest) were selected by some species, reinforcing the usefulness of structural diversity in maintaining bird diversity. Most important were forest remnants within a cutblock setting. Retention blocks appeared to satisfy the habitat requirements of all 'clearcut' birds and most 'forest' birds, as well as providing habitat for species not typically found in either. Some forest birds, however, appeared to need larger areas of intact forest than provided by the retention blocks. In addition, findings are subject to confirmation of successful breeding. For more details, see Lance & Phinney in *Forest Ecology and Management* 142 (2001) 267-280.

As a major forest licensee operating in northeastern BC, LP takes direction from several over-arching, broad-scale policy documents to help maintain birds in our operating area. These include various initiatives under the BC Forest Practices Code (Biodiversity Guidebook, Landscape Unit Planning,

Identified Wildlife Management Strategy) that give science-based direction on seral stage and patch size distribution, connectivity, old growth and block-level retention as well as detailed operational prescriptions for selected wildlife species. Other 'big picture' direction comes from a consensus-based land-use strategy (Dawson Creek LRMP), forest certification (SFI standard) and legal requirements of our Forest Development Plan. There are various challenges associated with effective implementation of these documents, but overall, they provide an effective framework for maintaining birds within our operating area.

In addition to these efforts, LP is involved in numerous 'fine-scale' projects that are strictly voluntary. These include 'code-plus' block-level guidelines for structure retention in cutblocks, bird habitat modeling projects, a nest box program involving the local nature club, a goal to minimize harvest during nesting season, inventory of stick nests, efforts to address red- & blue-listed species, and support for a local bird atlas project.

LANDBIRDS AND THEIR ROLE IN WEYERHAEUSER'S ADAPTIVE MANAGEMENT AND MONITORING PROGRAM FOR THE BC COAST. Glen Dunsworth, Weyerhaeuser BC Coastal Group; Email: glen.dunsworth@weyerhaeuser.com.

In June 1998, MacMillan Bloedel announced its Forest Project—a new and innovative approach to the way in which the company manages its private and tenured Crown forests on British Columbia's coast. The Forest Project is aimed at delivering an alternative to conventional clearcut-based harvesting and forest management practices. The Forest Project is commonly associated with the implementation of variable retention systems, a form of partial cutting phased in over a five-year period. Specifically, the project has three main objectives to: 1) achieve 100% variable retention, without compromising worker safety, on all the company's harvested Crown and private lands in coastal British Columbia by 2003; 2) increase conservation of old growth by dividing all forest lands into three stewardship zones, each with different management objectives; and 3)establish an adaptive management and monitoring program by 2003. Late in 1999, MacMillan Bloedel was acquired by Weyerhaeuser, which pledged to continue support for the Forest Project.

The adaptive management framework is based on Weyerhaeuser's broad goal of sustaining healthy, biologically rich forests while economically harvesting timber. Three characteristics of the desired forests were selected as measures that the goal is being achieved. These three "filters" are related biological indicators that help signal progress towards the goal. They are 1) habitat representation (coarse filter) – full representation of habitat types in a relatively unmanaged state to ensure that little-known species are retained; 2) habitat structure (medium filter) – full range of landscape and stand structures to ensure that key elements are present through time for organisms whose life history needs are better known; and 3) indicator organisms (fine filter) – the presence of select organisms to provide a means of tracking whether, by retaining structures and addressing representation, organisms will persist in particular landscapes and stand structures.

The Forest Project's ecological rationale, combined with social and economic considerations, led to the adoption of stewardship zones across Weyerhaeuser's private and Crown land and the application of retention systems within all zones. The adaptive management program is used to assess the effectiveness of practices at two levels: landscape and stand (Table 1). At the landscape level, the program is assessing the zones' effectiveness in sustaining biological richness and the appropriateness of the zone proportions and distribution over the land base. At the stand level, the program is testing the success of variable retention systems.

The Adaptive Management Working Group considered many focus questions, finally selecting five key ones that would maximize the learning in the short to medium term. The answers to these questions will provide the necessary feedback to the adaptive management program:

1. What is variable retention providing (in terms of maintaining habitat representation, habitat structures and indicator organisms) towards achieving the goal of biological richness?
2. Which practice is best: variable retention in patches, as dispersed cover, or in a combination of the two approaches?

3. What edge effects are created by variable retention?
4. Are the stewardship zones properly located?
5. What values and practices are associated with the restoration of old-growth structures?

Table 1. Stewardship zones and their attributes

Stewardship Zone	Description	Minimum Level of Stand Retention	Landscape Available for Harvest	Suitable Silvicultural Systems
Old Growth	Covers about 10% of the tenure, resulting in two-thirds of the area being reserved from harvest. This zone sustains late-successional organisms.	20%	33%	Group selection Irregular shelterwood
Habitat	Covers 25% of the tenure. The amount of the areas in retention and reserves can be modified to meet specific needs.	15%	70%	Full range
Timber	Covers about 65% of the tenure under variable retention. The focus of this zone is timber production without losing species from large geographic areas.	10% for group retention 5% for dispersed retention	80%	Group retention Dispersed retention Shelterwood

From the questions, predictions can be made and then tested through experimental research ("active" adaptive management) and operational activities ("passive" adaptive management). Information gained from both active and passive adaptive management will then be used to compare practices to each other or to known targets or benchmarks, and decisions will be made as to whether appropriate levels of attributes are attained. For example, the desirable attributes of snags maintained in variable retention blocks can be compared to the attributes of snags occurring in the natural forest. Information will also be used to develop models that can help forecast impacts across large areas and over long timeframes. This presentation describes the role of landbirds as part of the species level indicator in the adaptive management program and summarizes the progress and findings of the Forest Project after three years of implementation.

A FOREST ECOSYSTEM NETWORK FOR SOUTHEAST YUKON. Mike Gill, Environment Canada, Environmental Conservation, 91782 Alaska Hwy, Whitehorse, YT, Y1A 5B7; (867) 393-6760; Email: mike.gill@ec.gc.ca

Prior to 1995, little had been documented about the biological communities in the extreme southeastern Yukon. Current range maps suggested that some bird and plant species known to occur in northwestern Alberta, northeastern BC and southwestern Northwest Territories, were likely to occur in the southeast Yukon. Concurrently, industrial development (forestry and oil & gas) in the lower La Biche River valley and potential development in the Beaver River valley threatened to cause dramatic changes in the natural landscape. A 1996 Canadian Environmental Assessment Act screening of a proposed logging project identified the need for the establishment of a Forest Ecosystem Network in the La Biche River valley. Consequently, a technical group comprised of biologists from Environment Canada, Yukon Department of Environment and the Forest Resources Branch of the Department of Indian Affairs and Northern Development were directed to conduct surveys of the biological communities in the southeast

Yukon and use the information towards the development of a Forest Ecosystem Network that was representative of habitats found within the lower portion of the Yukon's La Biche watershed.

Field surveys of forest, wetland, sub-alpine and alpine birds and plants; habitat structure; amphibians, fish; forest insects and disease; forest dynamics; bats; and black bears were conducted during June and July from 1995 to 1999. This work involved biologists from Environment Canada, Yukon Department of Environment, DIAND Forest Resources and independent consultants. The resulting information in conjunction with various mapping and analytical tools assisted in designing a Forest Ecosystem Network that protects the range of landscapes, associated ecosystems, and habitats found in the La Biche valley.

Survey results show that this area is one of the most ecologically significant, unique and productive areas in the Yukon. The physiographic and climatic conditions of the area, together with the geographical position, combine to produce a unique mosaic of ecosystems, supporting bird, plant, mammal, fish and amphibian communities unlike those found elsewhere in the Yukon. Surveys revealed nine bird species, one amphibian species, one bat species and eleven plant species not previously recorded in the Yukon. The exceptionally productive forests support high densities of both widespread Yukon bird species and species at the edge of their range. Approximately 500 of the 1176 known plant species in the Yukon are found in the La Biche and Beaver River valleys.

The Department of Indian Affairs and Northern Development gave the recommended Forest Ecosystem Network interim protection from logging in 2001. Further efforts are now being planned for negotiating formal protection of the network from all industrial activities.

THE WILDLIFE CONSERVATION STRATEGY FOR THE TONGASS NATIONAL FOREST.
Eugene J. DeGayner[1] and George Iverson[2].
1 USDA Forest Service, Tongass National Forest, Box 309, Petersburg, AK 99833; email: edegayner@fs.fed.us.
2 USDA Forest Service, Threatened and Endangered Species, Rare Plants, Stop Code 1121, 1400 Independence Ave, SW, Washington, D.C. 20250-1121; Email: civerson@fs.fed.us

Spanning 17 million acres in Southeast Alaska, the Tongass National Forest represents the largest remaining expanse of relatively intact, temperate old-growth rainforest in North America. Occurring as a complex of forested islands, this diverse ecosystem supports world-class fish and wildlife resources and many endemic taxa. Planning for the conservation of biological diversity is made difficult by the region's steep topography and island geography, which create a naturally fragmented landscape. A subject of intense national interest and political debate, the Tongass National Forest is challenged to integrate complex social, political, and biological issues into the revisions of its Land Management Plan. The 1997 revision used an innovative, multi-scale approach to conserve biodiversity and prevent Endangered Species Act listings. A system of old-growth reserves provided the coarse-filter foundation for the strategy. Fine filter conservation measures, such as road management, were superimposed on the coarse-filter foundation. When coarse and fine filter considerations and other resource needs were combined, the effect was to make 90% of the productive old-growth forest unavailable for timber harvest. Landscape connectivity among reserves is provided by a system of corridors along the 11,000-mile coastline. Elevational landscape connectivity is also conserved by various measures including a system of riparian corridors designed to sustain aquatic biodiversity within watersheds. The presentation concludes with a summary of research and monitoring activities that will contribute to the challenging, long-term task of evaluating the conservation strategy.

EFFECTS OF FOREST DISSECTION ON BOREAL FOREST BIRD COMMUNITIES: ISSUES OF SCALE. Erin Bayne[1, 2], Steve Van Wilgenburg[3], Stan Boutin[1] and Keith Hobson[3].
[1] Department of Biological Sciences, CW 405, Biological Sciences Centre
University of Alberta, Edmonton, Alberta, Canada. T6G 2E9.
[2] Corresponding Author; E-mail: bayne@ualberta.ca.
[3] Canadian Wildlife Service, 115 Perimeter Road, Saskatoon, Saskatchewan, Canada. S7N 0X4.

Fragmentation of forest habitat by human activities has been shown to have a variety of effects on forest songbird communities. However, little is known about the early effects of fragmentation when trail and road development lead to increased human access of pristine forested landscapes. In North-eastern Alberta, development of oil & gas deposits has resulted in an extensive network of linear features (roads, seismic lines, pipelines) to explore, extract, and ship the resource. These activities have resulted in substantial loss of forest habitat, increased grass and shrub habitats, a higher proportion of edge, reduced forest patch size, and increased isolation of forest patches relative to naturally-disturbed landscapes. The objective of this study was to determine how the space-use patterns and relative abundance of boreal forest songbirds changed with increasing densities of linear features at different spatial scales. We predicted birds would either: 1) ignore linear features and incorporate them in their territories; 2) use linear features as territory boundaries; 3) avoid areas around linear features (edge effect); or 4) be attracted to the grass and shrubby habitat on the linear feature. At an individual level, we found that male Ovenbirds (*Seiurus aurocapillus*) fitted with radio-transmitters (n = 12) did not avoid the edges created by conventional seismic lines, but also did not incorporate seismic lines in their territory. As a consequence, mean Ovenbird density (± 1 SE) in 12.25 ha plots in areas containing 2 or more seismic lines (10.1 ± 0.72) or a single seismic line (9.5 ± 0.4) was lower relative to plots with no linear features (11.6 ± 0.52) based on repeat-visit spot mapping. Of 9 species mapped, six ignored the seismic line, with similar densities and space-use patterns in plots with and without seismic lines. White-throated sparrow (*Zonotrichia albicollis*) and mourning warbler (*Oporornis philadelphia*) were attracted to the grass & shrub habitat present on seismic lines with higher densities of these species on plots with multiple (4.1 ± 0.5 & 2.9 ± 0.7, respectively) or single seismic lines (2.8 ± 0.7 & 1.5 ± 1.3) relative to plots with no seismic lines (0.7 ± 0.3 & 0.3 ± 0.3, respectively). At a landscape scale (4 km^2), we used a systematic grid (9 stations) of point-counts to survey 36 areas where the linear feature density varied from 0 to 5.5 km per km^2. Distance to linear feature was a significant predictor in Poisson-based models for 6 of 51 species. The brown-headed cowbird (*Molothrus ater*), least flycatcher (*Empidonax minimus*), red-eyed vireo (*Vireo olivaceus*), white-throated sparrow, and mourning warbler were more abundant near linear features. The relative abundance of Swainson's thrush (*Catharus ustulatus*) was positively correlated with distance to linear feature suggesting this species avoided the area around linear features. Overall, few species showed a strong numerical response to linear feature density. Those species that did respond to linear features were mainly affected by habitat loss (i.e. Ovenbird) or habitat change (i.e. Mourning warbler) rather than edge avoidance.

THE IMPORTANCE OF MANAGING RIPARIAN HABITATS FOR LANDBIRDS ALONG THE TRANS-MOUNTAIN RIVER CORRIDORS OF SOUTHEAST ALASKA. Jim Johnson, Department of Fisheries and Wildlife, Utah State University, 5210 Old Main Hill, Logan, Utah, 84321-5210; Email: jim@seawead.org.

The major mainland rivers of Southeast Alaska are classified as two types: 1) those that transect the coastal mountains to connect the ecologically distinct regions of Southeast Alaska and the Canadian interior (trans-mountain), and 2) those rivers with watersheds limited to the coastal mountains (coastal). Both types of rivers contain a heterogeneous mixture of highly diverse and productive avian habitats, including deciduous riparian plant communities that are the most structurally and floristically complex deciduous habitats in Alaska.

Information on the composition, structure, and habitat relationships of bird communities recorded during the breeding season at 11 major mainland rivers in Southeast Alaska was synthesized from all known studies. A total of 170 bird species were recorded at these rivers. Of these, 134 species are known or suspected breeders. This total (134 species) comprises 50% of the total breeding avifauna for Alaska and 80% of the total breeding avifauna Southeast Alaska. Bird use of the major mainland rivers is highly seasonal - the majority (69%) of breeding birds are migratory. Major mainland rivers not only support a diverse breeding avifauna but are also migratory corridors and staging areas for large numbers of landbirds, waterfowl, seabirds, and shorebirds. The complex mosaic of habitat types at the major mainland rivers support a unique avifauna that is not found elsewhere in Alaska.

Although the major mainland rivers of Southeast Alaska are among the most intact riparian zones in the U. S., road-building, mining, hydroelectric power development, and timber harvest threaten these systems. To successfully maintain the integrity of these riverine landscapes, careful monitoring of land use and periodic assessment of bird populations are needed. In addition, due to the connectivity of several of the major mainland rivers between the U.S. and Canada, international cooperation between land managers is integral.