WORKSHOP

Report on the Noctur nal Raptor Monitoring W orkshop

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The goal of this workshop was to discuss the development of a strategy to deter mine the status and assess trends of noctur nal raptor species (i.e., noctur nal owls) in Canada and the USA. A strategy for diur nal raptor species was initiated at a workshop in Boise, Idaho in August 1996. The r esults of these workshops will form the basis for developing the North American Raptor Monitoring Strategy. This owl workshop focused on noctur nal survey techniques for inventorying and monitoring owls.

Another objective of this workshop was to review the efficiency and effectiveness of noctur nal owl survey techniques. Owl calling intensity varies thr oughout the year and may serve various functions. W e discussed what we know about owl calling and our ability to survey owls at night. Playback calls ar e commonly used to survey owl populations. The workshop discussed the effectiveness, the time frames and species' responses to playback. Speakers analyzed their owl calling data to determine how owl calling varies within a wide variety of parameters including envir onmental conditions, owl behavior , observers, and techniques. Workshop participants then discussed how to contribute to the monitoring strategy.

BROADCAST SUR VEYS AND MONITORING

Lisa Takats described some of the factors that affected owl detection in her 2-year study of owls in west-central Alberta. Her r esults are presented in a paper in these pr oceedings.

Glenn Pr oudfoot discussed the use of br oadcast surveys to deter mine habitat use of Fer ruginous Pygmy-owls (Glaucidium brasilianum) in souther n Texas (these proceedings). Barbara and Jim Beck described the owl surveys they have conducted in central Alberta using playback techniques (these pr oceedings).

Frank Doyle, Department of Zoology, University of British Columbia, pr ovided notes from an ecosystem study of cyclic fluctuations in pr edator-prey numbers in his study ar ea adjacent to Kluane National Park in the souther n Yukon. He compar ed the calling rates and the minimum number of male Bor eal Owls (Aegolius funereus) in 1989-1996 and the known population of Gr eat Horned Owls (Bubo virginianus) in 1989-1992 during peaks and lows of pr ey populations. The number of Gr eat Horned Owls during a low in snowshoe har e abundance was 34 percent lower than in the peak of hare abundance, but the calling rate declined 81 percent. Likewise, but less extr eme, when the number of Bor eal Owls declined by 80 percent due to a low in vole abundance, the calling rate declined 87 per cent. The abundance of prey also affected the onset of calling (calling started one month later in low food years), and the response rate (some males were not detected by playback in low food years). In addition, some owls flew towards the observer after playback, and then r esponded, providing false habitat data.

Pertti Saur ola discussed the techniques used to monitor owls in Finland (paper in these pr oceedings). Of particular inter est are the block study areas that volunteer ringers (banders) survey to deter mine nesting density of raptors, and in which they then band nestlings to provide a measure of productivity. Each year since 1982, 120 such blocks have been sur veyed. Species of owl that are censused are Boreal, Long-ear ed (Asio otus), Ural (Strix uralensis), Eagle (Bubo bubo), and Pygmy-owls (Glaucidium passerinum). His data indicate that ther e is a 3-year cycle in owl numbers in Finland, with a cyclic low in 1984 and every third year since.

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RAPTOR MONITORING STRA TEGY

Geoff Holroyd told the attendees about the workshop to develop a North American raptor monitoring strategy that was held in Boise, Idaho in August 1996. The goal of the North American Raptor Monitoring Strategy is to monitor the status and tr ends in continental and regional populations of Near ctic raptors in Canada, Mexico, and the USA. The strategy will present the optimum sampling design for surveys of each species of raptor, will critique sampling techniques and identify the species which curr ently lack suitable sampling techniques.

A report of the workshop discussion was produced in early 1997. The goal and objectives sections r eads as follows: "The participants endorsed the need for a North American Raptor Monitoring Strategy. The goal of this strategy is to monitor the status and tr ends in continental and r egional populations of Near ctic diur nal raptors in Canada, Mexico, and the USA. For the purposes of this strategy, diur nal raptors ar e defined as birds of prey in the taxonomic or ders Falconifor mes and Strigifor mes whose primary activity patter n is diur nal."

The thr ee objectives of this strategy ar e:

1. *To monitor species to ensur e that surveys have, at minimum, the ability to detect a 50 percent r eduction in population size over a 25-year period with alpha = 0.10 and beta = 0.20; with the expectation that power to detect tr ends for the majority of species would be much gr eater.*

2. *To identify the best combination of monitoring techniques for each species.*

3. *To recommend impr ovements in data collection ef forts, analysis methods, and regional coverage for each species and monitoring technique.*

The table of contents includes these headings: Intr oduction, Migration Monitoring, Br eeding Season Surveys, Non-Br eeding Season and Wintering Surveys, Monitoring Strategy for Individual Species, Statistical Issues, Next Steps, Outline of the North American Raptor Monitoring Strategy, and Participant List. The workshop r eport is available at: http://www.im.nbs.gov/raptor/raptor.html, or fr om: Robert Lehman, U.S. Geological Service, Biological Resour ces Division, Snake River Field Station, 970 Lusk Str eet, Boise, ID 83706, USA. The monitoring strategy is being developed by a volunteer task for ce that communicates thr ough a list serve. Inter ested parties can join the list serve by sending an E-mail message to: listpr oc@rana.im.nbs.gov In the body of the message (not the subject line) put: subscribe raptr end <your name>.

The strategy will present the optimum sampling design for noctur nal surveys of each owl species, will critique sampling techniques and identify the species which curr ently lack suitable sampling techniques. The r eader is encouraged to contribute to the development of the raptor strategy by discussing noctur nal counting methods, survey designs, coverage, analysis, and cooperation.

DISCUSSION

In this section we pr esent the discussion of issues by members of the audience. One speaker noted that Dr. P. Beamish (1993. Dancing with Whales. Cr eative Publishers, St. Johns, Newfoundland) has found that the interval between sounds in whale calls is as important or mor e so for communication than is the actual sound. In r esponse, another speaker noted that owls do r espond differently to the same calls. The cadence and pitch of a call seemed to affect the owls' responsiveness. It was suggested that captive owls be used to better understand vocalizations, their meaning, the r esponses of the owls and the changes in the owls' behavior over seasons.

Christmas Bir d Counts wer e discussed as a technique to monitor owl numbers, particularly peak numbers. However, they were criticized because the effort made to detect owls is not standardized. On many counts, owls ar e only encounter ed during daytime surveys. On a few counts, noctur nal surveys are conducted, but the amount and type of playback is not well documented in American Bir ds. It was suggested that ther e is a need to standardize Christmas Bir d Count owling techniques so that the r esults could be comparable. Br eeding Bird Surveys do not r ecord many owls and appear to be ineffective for monitoring noctur nal owls.

One speaker felt that owling techniques and owl behavior were too variable to standardize over all of North America. He suggested a range of protocols should be tested and proposed, but the observer would determine the technique to be used at a given time and location. A standardized protocol was used to survey Spotted Owls but the technique was less effective over time possibly due to habituation of the owls, or changes in their responsiveness due to changing density and prey abundance. A response was that a starting point would be to count the number of owls that were calling spontaneously in the initial listening period as the standard. The length of this listening period should be optimized for the proportion of responses per minute. Four to 10 minutes seemed to be the range of initial listening periods. Once playback was initiated, more variation was introduced in the characteristics of the playback and the behavior response of the owls.

Other speakers expressed concern about the added stress to the owls that may be caused by playback. Smaller owls such as Saw-whet and Boreal will approach an observer who has played a tape, but not necessarily vocalize. Possibly the small owls are concerned about revealing their location to owl predators. Since we know little about the meaning of calls and how they change over time, listening silently is the least disruptive technique and is effective for most species. Regardless of the technique, one speaker reiterated that the number of calls is not a linear function of the number of owls present. At higher densities, owls spend more time calling, presumably to defend their territories from the increased number of owls that want to breed.

Overall, the participants supported the idea of a Nocturnal Owl Monitoring Strategy. The document will be a valuable tool that can be used, tested, and refined. Participants were encouraged to join the list serve and volunteer to help develop the strategy.

SUMMARY

Owl calling intensity varies throughout the year and may serve various functions. The use of playback calls is a commonly used technique but its effectiveness is unknown. Also unknown is each species' response to playback and how the responses vary with time, both through the night, seasonally, and during the reproductive season. Sampling owls at night is complicated by variations in owl behavior and environmental parameters which vary seasonally. Environmental parameters include: time of year, time of night, moon phase, and weather (temperature, wind speed, precipitation, barometric pressure, and pressure changes). Survey parameters include: playback calls (species, sequence, and length of time of playback); length of time listening (time of initial listening period, time between calls, and end time); volume of playback; tape recorder/speaker quality; and background noise interference. Owl parameters include: detection distance, inter-stop distance; owl movements/behavior in response to playback; variation in response to breeding cycle; and reaction of breeders to non-breeders. The responses are likely to vary geographically by latitude, longitude and season. Observer parameters include hearing ability of observers; disturbance of owls; roadside biases; and off-road options.

There are several opportunities for cooperation. Nocturnal playback surveys have been used in many projects. Current projects that involve volunteers are underway in Ontario, Alberta, Manitoba, and Montana. A cooperative effort by these and any other projects could result in a North American owl monitoring group. With the many variables associated with playback, one suggestion of workshop participants was that the owls recorded in the initial listening period should become the standard for monitoring. Any responses to playback should be treated separately. The initial listening period varies between surveys (3, 5, and 10 minutes are often used) and this should be standardized, possibly at 5 minutes. A technique similar to the Breeding Bird Survey could result.

ACKNOWLEDGMENTS

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