Conservation priorities and peripheral species in the South Okanagan: Considerations for a proposed national park

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Abstract

Setting conservation priorities is critical if we are to be more effective in protecting species. In the South Okanagan, current conservation effort is strongly weighted to species occurring at the northern limit of their range because they cross a political boundary and are considered rare in British Columbia and Canada. A national park has been proposed for the South Okanagan in order to protect this nationally unique ecosystem and its corresponding flora and fauna. To examine current conservation practices in the South Okanagan I interviewed various stakeholders and government representatives on where they think conservation priorities should be allocated with regard to the proposed national park. The reasons given for why peripheral species should be allocated resources included: i) locally rare species help maintain genetic diversity; ii) locally rare species are charismatic and attract tourism; and iii) Canada cannot rely on the United States to protect core ranges, so we should protect what we have. Some responses lie at the other end of this spectrum, with noted concern for the effectiveness and wastefulness of allocating scarce resources to species irregularly occurring at the edge of their range. These proponents would rather see money spent on monitoring all species. If a South Okanagan national park is to be successful in terms of halting anthropogenic species extinctions and protecting continuously peripheral populations, recognition of stakeholder values and biological shortcomings for protecting those species must be considered.

Introduction

Much debate has occurred among scientists about where to channel conservation efforts, especially regarding those species at the edge of their range and that cross a political boundary (Bunnell et al. 2004a). With limited funds for conservation, lack of information, and rapidly shrinking natural areas, careful choices must be made. Several scientists argue that conservation priorities should be based on ecological measurements rather than arbitrary political boundaries that often do not follow natural borders (Bunnell and Squires 2004). With current conservation effort biased toward a few locally rare species that have healthy populations elsewhere in North America, other species that occur almost exclusively in British Columbia, or have globally declining populations, may be neglected. In this paper, I address this controversial issue by examining current conservation practices in the South Okanagan while maintaining the context of a proposed national park in that area. I will compare these conservation practices with what many scientists believe to be the direction our conservation priorities should be heading. I begin by clarifying the ways that species are peripheral

Peripheral populations are those populations that occur at the edges of a species' range. Generally, there are two broad ways a species can be peripheral:

1) geographically marginal (or disjunct); and

2) ecologically marginal.

Geographically (disjunct) marginal populations are separated spatially from the larger part of a species' range compared to ecologically (continuous) marginal populations that occur continuously at the edge of a species' range (Soule 1973) (Figure 1). These disjunct populations tend to be more genetically and phenotypically divergent from the continuous population because they have been sufficiently isolated that gene flow from larger populations is reduced (Lesica and Allendorf 1995). They have also evolved and adapted to different environmental conditions, which are important factors in speciation (Fraser 2000). These isolated populations may be well established inside different political jurisdictions from their core population. For example, the core breeding range for American White Pelican (*Pelecanus erythrorhynchus*) includes much of Manitoba, Saskatchewan, Alberta, Montana and North Dakota, but in British Columbia, there is one small breeding colony that is well established at Stum Lake (Figure 1). These small isolated populations, however, tend to be less resilient to unpredictable environmental conditions or human-caused changes, than more continuous populations. Therefore, if disjunct populations, and the potential they have for speciation and future biodiversity are to be maintained, their protection is essential. Disjunct populations have the potential to contribute an important component to future speciation and biodiversity, and thus warrant more protection than do continuously marginal populations (Bunnell et al. 2004a).

Ecologically marginal populations are those that live on the edge of the core species range. This edge is usually ill-defined, because environmental conditions in these areas are usually less favourable than in the core, and often vary from year to year (Bunnell and Squires 2004). For many species, the

edge of their range often straggles irregularly across political boundaries (hereafter referred to as "politically peripheral"), because the range of most species naturally fluctuate with changing environmental conditions. However, boundaries of provinces, states, and countries usually do not follow those set by nature (Bunnell and Squires 2004). British Columbia has many peripheral species as a result of its topography and geography, for example, the Tatshenshini-Alsek triangle encourages small extensions from the north, the Peace River region is the western margin for several eastern species, and the Puget Sound lowlands is the northernmost extent of many U.S. species. The South Okanagan has several politically peripheral species, both as a result of its topography, and of its place in the northernmost extent of the Western Great Basin (Harper et al. 1993). These species include White-headed Woodpecker (*Picoides albolarvatus*), Sage Thrasher (*Oreoscoptes montanus*), Pallid Bat (*Antrozous pallidus*), Gopher Snake (*Pituophis melandeucus*), and Night Snake (*Hypsiglena torquata*). To give an example of the irregularity of peripheral populations, Bunnell et al. (2004a) extracted the number of years White-headed Woodpecker and Sage Thrasher (Figure 2) have been observed in the Okanagan, from data housed at the Wildlife Data Centre (Victoria, BC). In a span of 117 years, both species combined were recorded only sporadically 26 % of the time. These species are locally rare within the province, and even Canada, but they are more common elsewhere.

Recovery plans provide an important mechanism for federal agencies to engage in conservation planning for "at risk" species (Schultz and Gerber 2002). However, they require large amounts of money and time for inventories and habitat enhancement for individual species. Several scientists are questioning the effectiveness of recovery plans as a long-term solution for endangered species (e.g., Abbitt and Scott 2001; Elphick et al. 2001). For example, in the United States, about 99 % of funding allocated to recovery plans has not facilitated recovery (for review see Bunnell et al. 2004b). This has been attributed to the focus on locally rare species, and a lack of funding spent on habitat acquisition.

A new approach to prioritizing conservation resources has been developed in a regional framework by Bunnell et al. (2004a). The five criteria are:

1) endemics (species and subspecies) (Figure 3);

2) significant world populations;

3) significant world ranges;

4) population trends; and

5) species vulnerability and threats.

These criteria reflect larger global conservation issues, by emphasizing regional stewardship responsibility in a global context, and by reinforcing the importance of a proactive approach. The system does not ignore peripheral species but, based on science and social responsibility, species

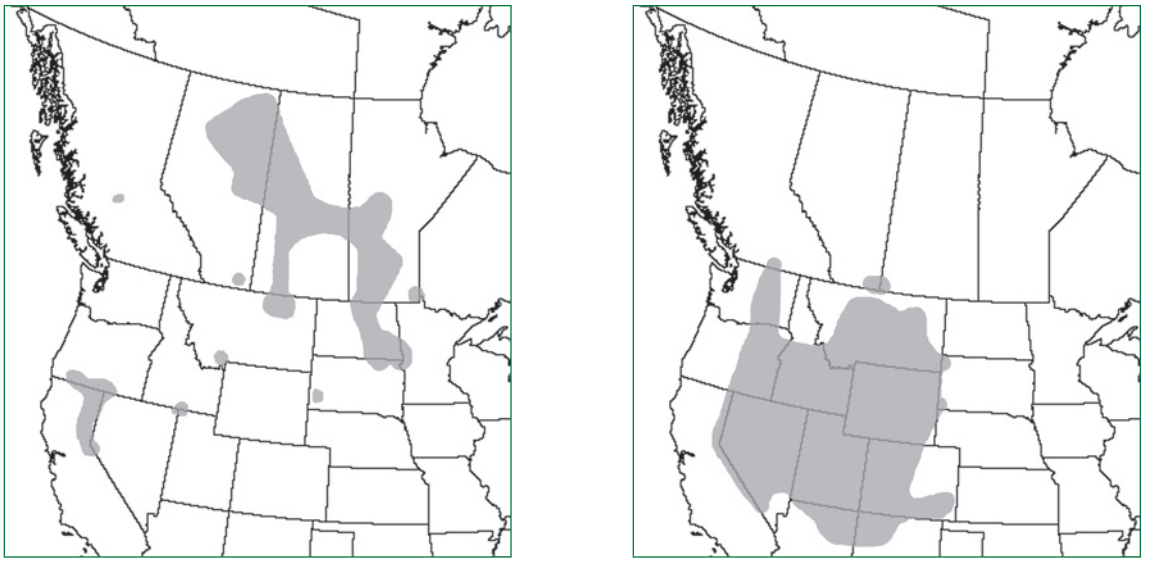

Figure 1. Example of disjunct (left; American White Pelican) and continuous (right; Sage Thrasher) peripheral populations.

that have significant world populations or ranges within a jurisdiction, or those that are declining considerably, should have higher priority for our conservation efforts (Bunnell et al. 2004b). Although many scientists argue for a more global perspective to species conservation, most countries operate within their own borders and the national status of a species is an important component. Consequently, a balance needs to be made between taking an approach that is either too global or too parochial (Avery et al. 1994), and thus a system is needed to identify national priorities within a global (or continental) framework.

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Parks Canada is an agency dedicated to protecting nationally significant examples of Canada's natural heritage. This priority is reflected in the Parks Canada mandate and is further reinforced through the National Parks Act revised in 2000 (www.parkscanada.ca). To satisfy this mandate, and to have good representation of the nations flora and fauna, Parks Canada aims to establish a national park in each of Canada's 39 terrestrial "Natural Regions". Deciding which species to target for conservation can be a difficult and lengthy process, so Parks Canada adopted the high priority (i.e., Red and Blue-listed) species identified by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). COSEWIC's mandate is to consider the status of all species in Canada, regardless of their status outside the country (Shank 1999). As a result, the list is heavily weighted toward peripheral species associated with marginal ecosystems. The COSEWIC list is used largely as a basis for new or revised legislation and to help allocate resources to species protection. However, the inclusion of politically peripheral species without reasonable explanation of why they are listed is misleading (Jones and Fredricksen 1999).

Federal species protection has recently been revised under the Species at Risk Act (SARA), which is the product of many policies and jurisdictional debates. However, the majority of species listed under the Act will only be protected if they are found on federal land, which presently constitutes ~5 % of Canada (excluding the territories) (www.sierralegal.org/reports/SARA_Guide_May2003.pdf). Thus, the primary role for the protection of habitat and species is given to the provinces and territories.

Study Area and Methods

The South Okanagan is the southern-most ecoregion of Canada's Interior Dry Plateau - Natural Region 3 (NR3) - with bunchgrass, ponderosa pine (*Pinus ponderosa*), and Interior Douglas-fir (*Pseudotsuga menziesii*) biogeoclimatic zones. It is one of the fastest developing areas in British Columbia, and also one of the most species rich (Bunnell and Williams 1980). Parks Canada selected the South Okanagan from four candidate areas (Churn Creek, Douglas Lake, Lac du Bois, and South Okanagan) (Figure 4) to represent NR3 because of its uniqueness and fragility to human development (Theberge and Theberge, 2003). Attributes include good representation of ponderosa pine and interior Douglas-fir forests, bunchgrass communities, and an array

Figure 2. The Sage Thrasher is a politically peripheral species with a recovery plan in British Columbia. Colville, WA. 7 June 1997 (R. Wayne Campbell).

Figure 3. On the Queen Charlotte Islands, the Northern Saw-whet Owl is an endemic subspecies. Dandas, Langara Island, BC. 5 April 1971 (Spencer G. Sealy).

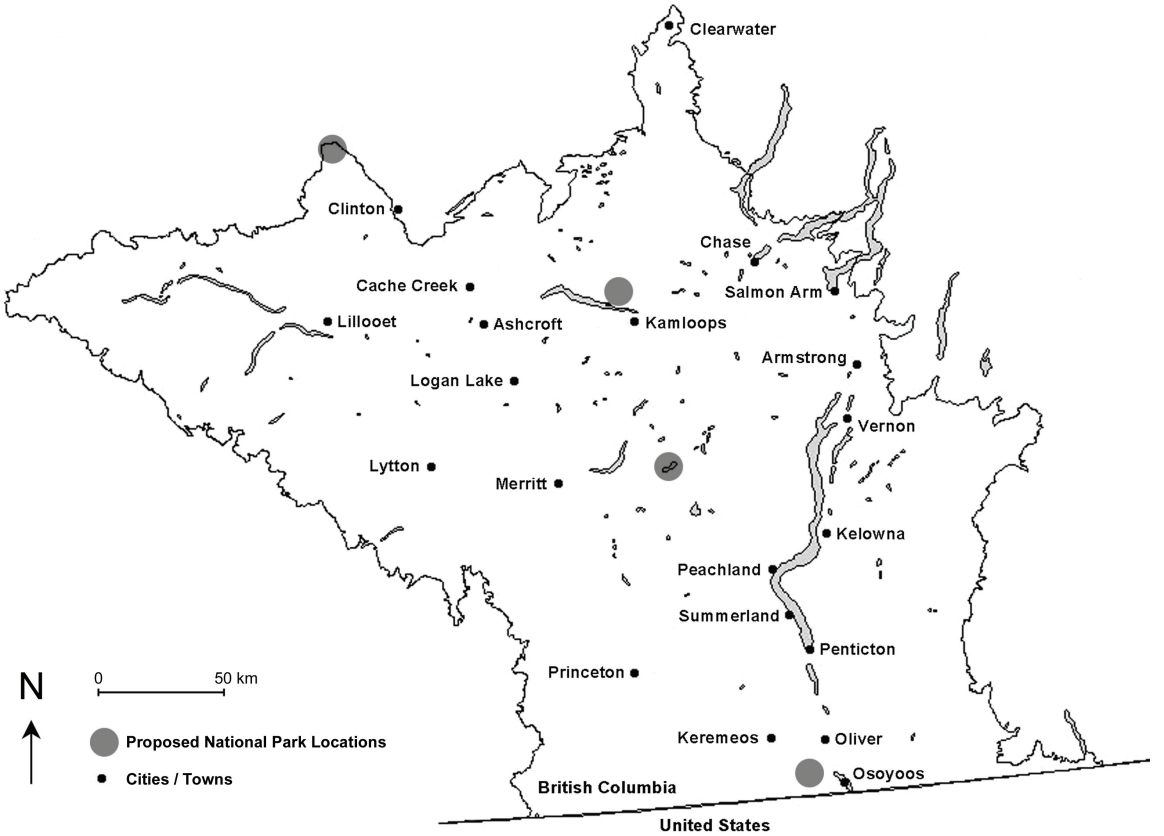

Figure 4. Map of the Okanagan Valley and surrounding area showing the four proposed national park locations. Note: The large dark circles do not reflect the precise boundaries of the parks, only the general location. From north to south, the proposed national parks are: Churn Creek, Lac du Bois, Douglas Lake, and South Okanagan.

of habitats ranging from the "pocket desert" to the alpine. The South Okanagan is the only candidate area in NR3 with antelope brush / shrub-steppe, which is listed as "globally imperiled" (Theberge and Theberge, 2003).

One motive for establishing a national park in the South Okanagan is the concentration of an unusually high number of federally listed, "at risk" species. It is often described as a "biodiversity hotspot" because it supports one of the most diverse, rare and unique assemblages of plants and animals in Canada (Scudder 2003). Nationally, 415 species are currently listed as extirpated, endangered, threatened, or of special concern by COSEWIC, of which 38 occur in the South Okanagan-Similkameen valleys (www.cosewic.gc.ca/eng/sct5/index_e.cfm). Many of these species are naturally peripheral to Canada, and their populations are secure and far more abundant south of the border.

Many factors besides protecting natural habitat for species are considered by Parks Canada when establishing a national park. These include political will, land claims issues, funding availability, local support, and opportunities for use and enjoyment. In addition, specific to the South Okanagan proposal, future international relationship opportunities have been discussed, through the concept of the Okanagan Grasslands International Park (Dr. John Theberge, pers. comm.). A major concern for establishing a national park in the South Okanagan, rather than in the more northern regions, is the lack of intact natural habitat (Figure 5). Only 10 % of the South Okanagan valley landscape remains in a near-natural state (BC Environment 2003), whereas northern regions have greater proportions of natural habitat.

The primary cause of species extinction is lack of habitat, suggesting that greater expanses of intact habitat

Figure 5. Rapid conversion of natural habitat for human use is a major reason for establishing a national park in the South Okanagan Valley. Along Black Sage Road near Okanagan River, BC. 11 March 2002 (R. Wayne Campbell).

is critical for successful species protection and recovery. Although northern grassland regions around Lac du Bois or Churn Creek may lack the biological diversity of the South Okanagan, those regions do support North American core area breeding populations for such species as Evening Grosbeak (*Coccothraustes vespertinus*) and Red-naped Sapsucker (*Sphyrapicus nuchalis*) (www.mbr-pwrc.usgs.gov/bbs/bbs.html). While these species are not listed as "critically imperilled" or "threatened", they do represent species that can be protected proactively, via global responsibility, before their populations decline precipitously.

From 25 April to 1 May 2004 I interviewed various stakeholders involved in, or concerned about, the proposed national park in the South Okanagan. These included local ranching families, winery operators, First Nations, a ranger and area supervisor for BC Parks, a representative of the Okanagan Similkameen Parks Society, interpreters for the Nk'mip Desert Centre and Osoyoos Desert Centre, a planner from the Ministry of Water, Lands, and Air Protection, The Nature Trust (TNT), The Land Conservancy (TLC), and biologists and naturalists. In addition, I interviewed the federal Minister of Environment, and a representative of Parks Canada. My questions covered such topics as:

1) the importance of the South Okanagan for protection.

2) current conservation priorities and practices in the South Okanagan.

3) the current focus on peripheral species protection.

4) opinions on recovery plans.

5) the implications of a national park in the South Okanagan.

Results and Discussion

There was a common thread among all individuals. They agreed that the grassland ecosystem needs protection from further development, without jeopardizing the local community. However, differences in opinion between the various communities on how best to prioritize conservation efforts were evident, and some questioned whether a national park is the best solution for the South Okanagan. How to protect the fragile grasslands in the most ecologically sound way is a continuing challenge for conservationists, especially considering current and projected human development in the valley. The local community feels strongly about the potential restrictions a new national park will impose on their freedom to enjoy the pleasures the South Okanagan affords (e.g., horse-back riding, off-roading, and hunting). In order to protect wildlife and maintain ecological integrity, conflicts between land use by wildlife and by humans must be resolved using ecologically, socially, and politically acceptable measures. Unfortunately, we too often diminish the inherent value of nature, and put our own interests far above all else. Some of what we enjoy and expect as humans must be sacrificed if we truly want to conserve nature beyond the present.

As with most jurisdictions in Canada, current conservation priorities in the South Okanagan are largely governed by provincial and federal lists of "at risk" species (i.e., listing is the pre-requisite to protection) (www.sierralegal.org/reports/SARA_Guide_May2003.pdf). Recovery plans for "at risk" species consume the majority of resources set aside for conservation in the South Okanagan. Species such as White-headed Woodpecker, Yellow-breasted Chat (*Icteria virens*), Pallid Bat, and American Badger (*Taxidea taxus jeffersonii*) all have individual recovery plans, either in draft or in progress, as part of the requirements of the Species at Risk Act (SARA) (www.speciesatrisk.gc.ca/search/default_e.cfm). The Burrowing Owl (*Athene canicularia*) (Figure

Figure 6. The Burrowing Owl is a "Red-listed", continuously peripheral species in British Columbia with little success through recovery efforts. This juvenile was photographed near Kathryn, AB. 15 July 1996 (Michael I. Preston).

6), a "Red-listed" and continuously peripheral species, has had a recovery team working to reintroduce the owl into the South Okanagan for over 20 years. After an initial effort of reintroductions from a wild population in Washington failed in 1986, two captive breeding facilities were built in British Columbia (www.naturalhistory.bc.ca/VNHS/Discovery). Since 1990, between 50 and 100 birds were released each spring, but return rates have been low, with only eight owls returning in 2003 (Jim Weis, pers. comm.).

The Yellow-breasted Chat recovery team is working to restore riparian areas, which includes fencing areas to restrict access by cattle (www.speciesatrisk.gc.ca). A second program, unrelated to the federal recovery effort, is working to reclaim and restore wetlands along the Okanagan River, at a cost of $135,000. It is expected that breeding habitat will be acquired for chats at a lower price than the recovery plan and support more breeding pairs (Eva Durrance, pers. comm.). Part of the recovery plan for White-headed Woodpecker includes habitat enhancement to encourage breeding and over-wintering of the species. This consists of thinning and prescribed burning, as well as a suet feeder program to increase observations of the species (www.speciesatrisk.gc.ca). One objective is to have 100 pairs of the woodpecker by 2050. This goal seems unrealistic, especially when considering the nature of continuously peripheral populations. In the 117 years that birds have been recorded in the South Okanagan, only eight White-headed Woodpecker nests have been found (Campbell et al. 1990). Prior to 1950, only three documented records are known, despite active exploration by collectors, naturalists, and ornithologists in the first half of the twentieth century (Cannings et al. 1987). It seems unlikely that the recovery plans currently in progress will be successful, because the primary problem is that they continue, like earlier recovery plans, to emphasize the conservation of peripheral species.

Most of the local residents interviewed take pride in having many rare species living on their doorstep, and strongly support conservation efforts of these federally "endangered" wildlife (e.g., Sherry Linn, Sean Black, Ron Hall, pers. comm.). The arguments made included:

1) conserving genetic diversity;

2) they naturally occur here, they should be protected;

3) people do not want to see these species disappear from the area, because they are unique to Canada;

4) many are charismatic and beautiful, and are therefore worth the effort;

5) rare species attract tourism;

6) by focusing attention on these species, other species will be protected (i.e., the umbrella species concept); and

7) we cannot rely on the United States to protect core ranges of these species, so Canada must protect what it has.

Several of these statements are anthropocentric, and do not address the biological importance of species populations. Some of these points are similar to those mentioned by Hunter and Hutchinson (1994) and Fraser (2000), but as discussed by Bunnell et al. (2004b), many attributes of focusing our efforts on peripheral species are largely unattainable. When considering the low success rate of recovery efforts for peripheral species, the social and economic benefits of having these rare species in the South Okanagan may be short-lived. If these species do disappear from the area, what effect will

this have on public support for conservation? The resources spent on attempting to protect a few peripheral species may be better spent on a combination of conservation projects to protect other species, and educational programs to teach the public about the importance and inherent attractiveness of more common species (Simberloff 1998). In particular, emphasis should be pointed toward species with globally declining populations, or significant world range or abundance in British Columbia.

Several people I interviewed in the South Okanagan questioned the utility of spending a large portion of our limited conservation resources on "Red-listed" species, since most of these are naturally peripheral to Canada and common elsewhere (e.g., a local BC Parks staff member, Carl McNaughton (TNT), Dr. John Theberge, pers. comm.). Of the 38 species designated "at risk" by COSEWIC and occurring in the South Okanagan, more than half are peripheral to Canada. Possingham et al. (2002) argues that the lists were not designed for setting conservation priorities, and are thus being used inappropriately. They concluded that "*it is naive and counterproductive ... to use threatened species lists alone to allocate conservation resources for recovery,* [and] *to guide reserve planning.*" Both Carl McNaughton and Dr. John Theberge said they would rather see funds used for monitoring populations of more common species, rather than recovery plans for locally rare species that often fail. Nevertheless, current efforts for protecting species in the South Okanagan continue to focus on a few peripheral species. With limited resources, and the possibility of a new national park in the area, better spending of conservation funds needs to be addressed. This may be a good opportunity for Parks Canada and scientific researchers to be more proactive, and adopt the priority-setting system developed by Bunnell et al. (2004a).

"...should we continue to spend most of our limited conservation resources on peripheral species, or can a new system be implemented, for greater effectiveness and species representation?"

Species extinction is primarily a result of human-caused habitat loss and degradation (Soule 1986). Therefore, habitat acquisition and reclamation will be the most valuable means for protecting species, because without suitable habitat, all other forms of species recovery will be ineffective, or at the very least, inefficient. A national park in the South Okanagan may help direct conservation efforts toward a more proactive approach by protecting large areas of habitat. If the national park does protect all representative habitats in the South Okanagan, and not only the marginal ones, it has the potential to protect species that are not currently recognized by SARA, and prevent them from being listed in the future. Dunn et al. (1999) argue that responsible conservation goals should be based on a proactive, multi-species approach, which emphasizes improved monitoring of species' populations, so that conservation action can take place before it is too late for species recovery.

Conclusion

Two different approaches to prioritizing conservation efforts are apparent, and both are based on rational science. The conventional approach is the listing of species in the context of political boundaries, such as a province, state, or country. By definition, species that barely extend their range into another political unit often get "Red-listed", because they are inherently rare. Therefore, when these lists are used in legislation as a basis for allocating resources, many continuously peripheral species are granted higher conservation status. To shift the focus from a parochial framework to a global (or continental) context, Bunnell et al. (2004a) have developed a new approach for setting conservation priorities. With the prospect of a new national park in the South Okanagan, the question remains, should we continue to spend most of our limited conservation resources on peripheral species, or can a new system be implemented for greater effectiveness and species representation? Past recovery efforts of "Red-listed" species have largely failed because the attention has been on peripheral populations. To succeed with species conservation, each political jurisdiction must consider the importance of having species that represent either a significant proportion of that species' world range or population within their borders.

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