JEM Readers Respond . . .

I would like to clear up a couple of points presented in Bunnell *et al.*'s (2005) recently published article in *JEM* 6(2) as it relates to the British Columbia Conservation Data Centre (CDC) [see **"Assessing the need for species conservation action in British Columbia"**: *www.forrex.org/jem/2005/vol6/no2/vol6_no2_art3.pdf*]. The Conservation Status Ranks (subnational or "S" ranks) that are assigned to species and natural plant communities by the CDC are based on the status of the entity within the borders of British Columbia. As a result, some species occurring at the edge of their range will have a status rank denoting that they are at risk. The issue of whether these species should be a priority is decided on a case-by-case basis through the application of priority assessment criteria. Where a species "irregularly crosses the border," a rank of "accidental" is applied and the entity is not tracked. Conservation Status Ranks are but one factor used in the assignment of conservation priorities. The CDC does not advocate or promote the use of the resulting regional lists (i.e., the Red and Blue lists for British Columbia) for the purpose of assigning conservation priorities, and in that regard we thank Bunnell *et al.* (2005) for helping to spread this very important message. In addition to their paper, many other papers and much associated research highlight the dangers of assigning conservation priorities on the basis of regional lists (e.g., Molloy *et al.* 2002; Possingham *et al.* 2002; Quayle and Ramsay 2005).

Bunnell *et al.*'s paper, however, does contain some misinformation regarding the practices of the CDC. Although they have correctly listed "trend" as one of the criteria used by the CDC, they later infer that trends are not used in the establishment of "S" ranks (i.e., under the heading "Population Trends" they state: "Assessment of concern should not be restricted to rare species" and "Where possible, historical trends in populations in British Columbia should be analyzed before allocating conservation resources or designating endangered or threatened status"). Trends have always been used *when known* and are weighted heavily. Many species show declining trends, but still have relatively large ranges, populations ranked as "S4," and may be placed on a "watch list." To clarify, the Red and Blue lists used in British Columbia represent a simplification of the "S" ranks assigned to species and natural plant communities by the CDC. These ranks go from S1 (most at risk) to S5 (secure). When predicting extinction risk, O'Grady *et al.* (2004) found that trend was the most important factor in assigning risk to large populations—but not in small populations. Based on their assessment, population size is the most important data to collect for threatened species and trend should be the major focus in endangered species categorization and state-of-the-environment reporting.

Bunnell *et al.* (2005) were apparently unaware that in 2002 the CDC changed the methodology it uses to assign "S" ranks. Currently, the factors used to assess the "S" rank of species and natural plant communities (Regan *et al.* 2004; NatureServe Explorer 2005) are (not in order of importance):

- number of element occurrences,
- population,
- extent of range,
- area of occupancy,
- short- and long-term trend,
- threats (scope, severity, and immediacy),
- environmental specificity, and
- intrinsic vulnerability.

Many schemes exist to establish priorities within a jurisdiction, all with varying merit. The appropriateness of these schemes depends on the purpose of the prioritization exercise. Carter *et al.* (2000), and then Panjabi (2001), established a widely accepted method that includes "Area Importance," which takes into account the relative importance of an area for the species within a jurisdiction's responsibility. Partners in Flight uses this scheme. Bunnell *et al.* (2005) cite the proposal by Dunn *et al.* (1999), another well thought out process for setting conservation priorities that also takes into account a jurisdiction's responsibility for a species. Other criteria used in establishing conservation priority lists (e.g., Molloy and Davis 1992; Breininger *et al.* 1998; Barker 2002; Rodríguez *et al.* 2004) include, but are not limited to:

- global conservation status rank ("G" rank)
- taxonomic uniqueness
- probability of success either by management or recovery plans
- cost of conservation
- First Nations importance
- aesthetic qualities
- public perception of importance
- the ability of the species or natural plant community to act as an umbrella species and, by establishing it as a priority, aid in the conservation of multiple species
- status in adjoining jurisdictions
- economic importance
- research importance or health implications

To help maintain biodiversity in British Columbia, we need to establish a conservation priority scheme. A review of current practices, along with examples can be found in Fraser *et al.* (2004). A suitable conservation priority scheme can be developed and applied by using (as one criterion) a risk assessment system that is based on well-established criteria and that has been designed for regional assessments (e.g., Millsap *et al.* 1990; IUCN 2003; Andelman *et al.* 2004; Regan *et al.* 2004).

Acknowledgements

Thank you to David Fraser and Jenifer Penny for providing valuable comments.

References

Andelman, S., C. Groves, and H. Regan. 2004. A review of protocols for selecting species at risk in the context of US Forest Service viability assessments. Acta Oecologica 26:75–83.

Barker, G. 2002. Phylogenetic diversity: A quantitative framework for measurement of priority and achievement in biodiversity conservation. Biological Journal of the Linnean Society 76(2):165–194.

Breininger, D.R., M.J. Barkaszi, R.B. Smith, D.M. Oddy, and J.A. Provancha. 1998. Prioritizing wildlife taxa for biological diversity conservation at the local scale. Environmental Management 22:315–321.

Bunnell, F.L., R.W. Campbell, and K.A. Squires. 2005. Assessing the need for species conservation action in British Columbia. BC Journal of Ecosystems and Management 6(2):29–37. URL: *www.forrex.org/jem/2005/vol6/no2/vol6_no2_art3.pdf*

Carter, M., W. Hunter, D. Pashley, and K. Rosenburg. 2000. Setting conservation priorities for landbirds in the United States: The Partners in Flight approach. The Auk 117(2):541–548.

Dunn, E., D. Hussell, and D. Welsh. 1999. Priority-setting tool applied to Canada's landbirds based on concern and responsibility for species. Conservation Biology 13(6):1404–1415.

Fraser, D.F., S.G. Cannings, K. Paige, K. Nelson, and A.P. Harcombe. 2004. Risk listing and setting conservation priorities for species in British Columbia: A review of current practices. *In* Proceedings of the Species at Risk 2004 Pathways to Recovery Conference. T.D. Hooper (editor). Victoria, B.C.

IUCN. 2003. Guidelines for application of IUCN Red List criteria at regional levels. Version 3.0. IUCN Species Survival Commission, Gland, Switzerland and Cambridge, U.K.

Millsap, B., J. Gore, D. Runde, and S. Cerulean. 1990. Setting priorities for the conservation of fish and wildlife species in Florida. Wildlife Monographs No. 111.

Molloy, J. and A. Davis. 1992. Setting priorities for the conservation of New Zealand's threatened plants and animals. Department of Conservation, Wellington, N.Z.

Molloy, J., B. Bell, M. Clout, P. de Lange, G. Gibbs, D. Given, D. Norton, N. Smith, and T. Stephens. 2002. Classifying species according to threat of extinction: A system for New Zealand. Threatened Species Occasional Publication No. 22.

NatureServe Explorer. October 2005 (last update). NatureServe Conservation Status. URL: *www.natureserve.org/explorer/ranking.htm*

O'Grady, J., D. Reed, B. Brook, and R. Frankham. 2004. What are the best correlates of predicted extinction risk? Biological Conservation 118:513–520.

Panjabi, A. (compiler). 2001. The Partners in Flight handbook on species assessment and prioritization. Rocky Mountain Bird Observatory, Brighton, Colo.

Possingham, H.P., S.J. Andelman, M.A. Burgman, R.A. Medellin, L.L. Masters, and D.A. Keith. 2002. Limits to the use of threatened species lists. Trends in Ecology and Evolution 17:503–507.

Quayle, J. and L. Ramsay. 2005. Conservation status as a biodiversity trend indicator: Recommendations from a decade of listing species at risk in British Columbia. Conservation Biology 19:1306–1311.

Regan, T., L. Master, and G. Hammerson. 2004. Capturing expert knowledge for threatened species assessments: A case study using NatureServe conservation status ranks. Acta Oecologica 26:95–107.

Rodríguez, J. P., F. Rojas-Suárez, and C. J. Sharpe. 2004. Setting priorities for the conservation of Venezuela's threatened birds. Oryx 38:373–382.

Sincerely,

LEAH RAMSAY, Program Zoologist
Conservation Data Centre
PO Box 9358, Stn Prov Govt
Victoria, BC V8W 9M2
Leah.Ramsay@gov.bc.ca

Author's Response

We appreciate Leah Ramsay's clarification of the methodology used by CDC and NatureServe to establish ranks. Sharing such information can only help refine approaches to ranking species for conservation action. We found that considerable flux exists within factors considered by both CDC and the National Recovery Working Group. This is not surprising considering that the principles of conservation biology are, as yet, young and

not fully evaluated. We expect continued evolution in factors used to rank species and their weighting. Because principles are young, they merit scrutiny; *JEM* provides a useful forum for this scrutiny and for clarification.

Regarding trend, a more complete quotation of our argument reads:

> *When available, trend data are the most compelling element of "concern." Assessment of concern should not be restricted to rare species. It is important to address trends of relatively common species before they become rare enough to be listed by CDCs on regional lists because . . .* [list of four reasons]. (Bunnell *et al.* 2005:34)

Our argument was based on the premise that a portion of our efforts to conserve species should be directed towards keeping common species common. This task does not fall readily within the mandate, and certainly not the funding, of the CDC. The CDC does attempt to assess conservation status of all species, but has no mandate to assign conservation priority.

A major challenge in the allocation of resources for conservation action will continue to be the relative weighting among three broad conservation objectives:

1. maintaining native species richness;
2. contributing to maintenance of globally widespread, but declining, species that occur relatively rarely within the province; and
3. keeping regionally common species common.

With any policy decision, the primary influences are social and economic, but science has a role. We hope that our contribution, and that of Ramsay, encourages awareness of the available choices among conservation objectives, and consideration of the likely outcomes of our choices. Given that funding for conservation will be limited, the choices will not be easy and merit public discussion.

Sincerely,

FRED BUNNELL, Honorary Professor
Centre for Applied Conservation Research
University of British Columbia
3041–2424 Main Mall
Vancouver, BC V6T 1Z4
fbunnell@interchange.ubc.ca

Editor's Note:

Articles published in *JEM* represent our authors' perspectives and their presentation of research results or syntheses of the best available information. Readers are encouraged to submit comments about articles to the Editor (*jem@forrex.org*), and are also encouraged to contact authors for clarification or further information on topics presented in *JEM*.