

# Ranking Forest Rarity: No Need to Reinvent that Wheel!

In the article by John L. Innes and Kenneth B. H. Er ("Questionable Utility of the Frontier Forest Concept," *BioScience* 52: 1095–1109), the authors conclude by proposing that "the existing biodiversity element ranking system and indicators used by the Network of Natural Heritage Programs and Conservation Data Centers to identify and prioritize the conservation of endangered species in the United States, Canada, and Latin America be adapted and developed for use with forest ecosystems." But that wheel already exists!

NatureServe and its network of natural heritage member programs have been assessing the status of both species and ecological community types for over 15 years using the global ranking system (G1 through G5) that Innes and Er highlight in their article (see table 4). Because determining forest status first requires agreement on the ecological units to be assessed, NatureServe has been instrumental in the development of a vegetation classification standard, the US component (Grossman et al. 1998) of which is formally recognized as a US federal standard (FGDC 1997). Efforts to develop a comparable classification system for Canada are currently under way in collaboration with the Canadian Forest Service, Parks Canada, and provincial partners. Currently recognized vegetation units (including forest and woodland types) and their conservation status ranks can be found on the NatureServe Explorer Web site ([www.natureserve.org/explorer](http://www.natureserve.org/explorer)). These status assessments have proven enormously useful to private organizations and government agencies in setting land conservation and management goals, and recently have been adopted for use in forest certification by the Sustainable Forestry Initiative.

We would caution, however, that such a ranking system on its own is insufficient to define conservation priorities for forests. These ranks and the biolog-

ical data on which they are based represent an excellent starting point from which to incorporate a suite of criteria, including ecological, landscape, and socioeconomic factors, that together help to identify conservation priorities.

## References cited

- [FGDC] Federal Geographic Data Committee. 1997. Vegetation classification standard, FGDC-STD-005. (21 January 2003; [www.fgdc.gov/standards/status/sub2\\_1.html](http://www.fgdc.gov/standards/status/sub2_1.html))
- Grossman DH, et al. 1998. International Classification of Ecological Communities: Terrestrial Vegetation of the United States, Vol. I: The National Vegetation Classification System: Development, Status, and Applications. Arlington (VA): The Nature Conservancy.

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## RESPONSE FROM INNES AND ER

*Faber-Langendoen indicates that the approach we suggested is already in use. We concur: The system developed by NatureServe for the United States adopts the classification system that we recommend. The system that has been developed for the United States could certainly be copied by other countries or form the basis for an international effort, but this has yet to be done. The Canadian experience has shown how difficult it is to develop a national standard, and the challenge will be to develop and apply such a system for forest conservation at a global scale. However, use of the system in the United*

*States does not guarantee global use, and we reiterate our conclusion that we need to adopt a global approach to the identification of the forests most in need of conservation.*

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*Editor's note: The open letter to which the following letters to the editor refer can be found at [www.wwfus.org/news/attachments/whaling\\_ad.pdf](http://www.wwfus.org/news/attachments/whaling_ad.pdf).*

## "SCIENTISTS VERSUS WHALING": WHOSE ERRORS OF JUDGMENT?

In "Scientists versus Whaling" (*BioScience* 52: 1137–1140), Aron, Burke, and Freeman defend Japan's controversial "scientific" whaling program against a series of criticisms we made in an open letter to the Government of Japan last May in the *New York Times*. Our letter, signed by 21 eminent scientists, including three Nobel laureates and several pioneers of conservation biology, called on Japan to suspend its whaling program.

Aron and his coauthors claim that our letter contains numerous errors of fact and law, and they cite it as an example of "science advocacy" wherein scientists, driven by passion or politics, lower their professional standards in support of popular causes. To the contrary, our overriding concern is for sound science uncorrupted by a political

### Letters to the Editor

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agenda, a standard that Japan's whaling program fails to meet.

Aron and colleagues also attribute nonscientific motives to the signatories of the letter, suggesting—without supporting evidence—that politics, emotion, or sentiment have undermined our professional responsibility. Such challenges to a scientist's motivation and scientific trustworthiness should not be made lightly. Yet so far as we are aware, Aron and coauthors made no effort to determine the validity of their charges.

As signatories to the *Times* letter, we stand resolute by our statements: Japan's scientific whaling program is poorly designed from a research perspective; it results in the needless deaths of hundreds of whales each year, despite a global moratorium to which Japan is legally bound; its commercial nature creates financial incentives to kill whales even in the absence of a clear scientific purpose; and it erodes public confidence in the legitimate role of science as a guide to policy.

Although Aron and his coauthors devote roughly a third of their article to general admonishments about the hazards of advocacy science, their article exemplifies the "lack of careful attention to relevant facts" that the authors decry. Among its erroneous statements and important omissions are the following:

- Aron and colleagues claim that "most of the scientists who signed the letter are not...involved with...wildlife science." This sweeping indictment of critics of Japanese whaling is simply incorrect. In fact, 18 of the 21 signatories are highly qualified in wildlife-related disciplines. We cannot understand how such an error of fact made it through the peer review process. The claim is also irrelevant: Expertise in cetacean biology is hardly requisite for detecting the scientific deficiencies in Japan's whaling program.
- Aron and colleagues equate utilization of whales killed for research with commercial use—that is, they

intimate that the commercial sale of whale meat is necessary to meet the requirement of the International Convention for the Regulation of Whaling for "nonwasteful disposal" of carcasses. Yet nowhere does the convention state that the carcasses should be sold for commercial purposes. And Japan's "scientific" whaling yields tens of millions of dollars each year in revenue from Japanese seafood markets, thereby creating powerful financial incentives to kill increasing numbers of whales. Indeed, recent DNA analysis of whale meat sold in Japan indicates that scientific catches may conceal an undocumented trade in meat from endangered stocks.

- Aron and colleagues charge that we erred in stating Japan has claimed an exemption for scientific whaling under international law. Japan has done so for well over a decade, invoking a special provision under the whaling convention. Seeking to refute this well-documented history, Aron and coauthors argue that Japan never actually *needed* such an exemption. This novel (if unpersuasive) legal argument ignores the reality that Japan has in fact regularly invoked an exemption for scientific whaling, as we maintained.
- The authors dismiss as "an indiscriminate broadside without foundation" the key scientific failing that Japan's whaling program lacks a testable hypothesis. But Aron and colleagues never offer such a hypothesis. We know of no university graduate department that would sanction the sacrifice of thousands of vertebrates without one. Prevailing academic guidelines on the use of animals in university research require showings that Japan's whaling program simply could not meet.

In addition to its battery of misstatements, the article by Aron, Burke, and Freeman is noteworthy also for its omissions, in particular its failure to address

two points central to our letter. The first concerns Japan's decision last year to resume hunting sei whales, an internationally listed endangered species, ostensibly to determine the whales' diet. Japan had already analyzed the stomach contents of more than 20,000 sei whales in prior decades. We do not think it credible that Japan's motive for killing 50 sei whales a year is the expectation that more examinations will materially add to what is already known about the diet of the sei whale.

A second unanswered point concerns the increasingly transparent commercial nature of Japan's "scientific" whaling. Last year Japan allocated scientific whaling permits for 50 minke whales expressly to the individual whaling villages for which it has failed to secure commercial quotas since the advent of the moratorium. Using the guise of science to issue so-called relief whaling quotas took the pretense of scientific whaling to a new level of overtness, drawing heightened international condemnation of a program that continues to damage Japan's reputation.

As Aron, Burke, and Freeman claim to be informed professionals, they should recognize that disagreement on the scientific merits of Japanese whaling can hardly justify their highly public, strongly worded charge of professional irresponsibility on the part of the scientists who signed the open letter in the *New York Times*. Although Aron and his coauthors rightly see a danger to science from careless advocacy, they are wrong to ignore the equal danger posed when powerful governments use science as a pretext to advance an overtly political agenda. We believe that those who care deeply about the credibility of science have an obligation to speak out against the manifest abuse of science for political ends. We do not believe it would be responsible to do otherwise.

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### NEUTRAL JUDGES IN A DEBATE ON SCIENTIFIC MERITS?

In a recent Forum article (“Scientists versus Whaling,” *BioScience* 52: 1137–1140), Aron, Burke, and Freeman cite World Wildlife Fund (WWF) in connection with an open letter about Japanese whaling. They claim that information in the letter was inaccurate and reflected poorly on the capability of the “instigating organization”—namely, WWF—and on the care taken by the 21 scientists who signed the letter. While the eminent scientists who signed the letter are quite capable of responding for themselves regarding their standards, here we point out two critical omissions by Aron and colleagues that we believe could seriously mislead *BioScience* readers.

In seeking to diminish the open letter’s criticisms of Japanese research whaling, Aron, Burke, and Freeman cast the criticisms as the careless errors of “scientist–advocates” who have incautiously strayed beyond their areas of expertise. Yet Aron and his colleagues were aware that identical criticisms of Japanese whaling had been published by expert whale biologists on the International Whaling Commission’s Scientific Committee. That they failed to disclose this, opting instead to assail the care taken by the letter signers, is characteristic of their entire article.

A second omission is the failure of Aron, Burke, and Freeman to level with *BioScience* readers (and, one presumes, with its editors) about their own ideological views and involvement with commercial whaling. While ordinarily this might not seem germane, Aron, Burke, and Freeman so pervasively question the professionalism of others that their failure to disclose their own background becomes relevant by implication. As it happens, they are far from the impartial observers readers might imagine: William Aron has traveled to Japan at the expense of the Japanese government to provide political and strategic advice on whaling; William Burke’s clients have included the Japanese Whaling Association; and Milton Freeman is the convenor of the World Council of Whalers, a private group that promotes commercial whaling and whose conferences are funded by Norway and Japan. In addition, three of the four individuals acknowledged as assisting the authors have professional ties to pro-whaling interests or are currently employed by the Japanese government in connection with commercial whaling.

Aron, Burke, and Freeman are, of course, fully entitled to their opinions on Japanese whaling, but they cannot pose as expert, neutral judges in a debate on its scientific merits. Their decision to submit to a scientific journal an article that questions the professional judgments of others while concealing their own relevant professional ties to commercial whaling—including client and sponsor relationships—is disingenuous at best.

What seems extraordinary is that Aron, Burke, and Freeman managed to secure such prestigious placement for their article. The editorial penned by editor-in-chief Timothy Beardsley, however well-intended, only compounded the decision—misguided in our view—to provide these individuals so prominent a platform for such misleading advocacy.

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**RESPONSE TO MOTT FROM ARON, BURKE, AND FREEMAN**

*Richard Mott's letter does not attempt to respond to the criticisms we make of the substantive content of the open letter published in the New York Times. Rather, he refers to criticisms of a recent portion of the Japanese research program by some members of the Scientific Committee of the IWC. These criticisms were raised in the Scientific Committee, refuted in writing by Japan, and, after discussion, resulted in no action by the committee. He says our failure to mention these criticisms is misleading. That different scientific opinions and views are held by members of this large committee should surprise no one. However, our references to this committee were to the opinions of the committee as a whole and not to comments by selected members. As we noted, numerous positive assessments by the committee or by its review groups of the scientific quality of the overall Japanese whale research program refute the conclusion in the open letter that the Japanese research program as a whole lacks scientific credibility and contributes nothing to whale management.*

*We are also accused of misleading readers by failing to "disclose our own background," which Mr. Mott says is "relevant by implication." The background he has in mind is that each of us has engaged in professional activities that he believes taint our objectivity on the matter of scientific whaling. We are surprised that Mr. Mott refrains from using the*

*opportunity of publishing a response to our article to show how our alleged bias infects the criticisms we make of the content of the open letter. We have no need to hide the fact that we have all been active for many years in research and in writing books and articles about whaling and related marine issues. It is scarcely surprising that having published our work in reputable journals, we have from time to time been invited to provide professional services to many national and international agencies and organizations, including some in Japan. Our research background informs our commentary, and we hope that the substance of our commentary can be fairly assessed and evaluated on its own merits or lack thereof. Readers will surely know that our submission was subject to peer review by specialists selected by BioScience, not by ourselves.*

*Our article is not a defense of Japan or of whaling. It is a plea to scientists who use their prestige to make scientific and legal arguments on behalf of a cause to do their homework and be sure of their facts. Now, more than ever, it is critical that the public trust its leading scientists.*

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**THE TORTUOUS HISTORY OF "SCIENTIFIC" JAPANESE WHALING**

**T**he title of the article by Aron, Burke, and Freeman (*BioScience* 52: 1137–1140) is misleading: The letter that they criticize, published as an advertisement in the *New York Times* last May, opposes the abuse of scientific

provisions in the International Convention for the Regulation of Whaling (ICRW), 1946, not whaling as such.

When the International Whaling Commission (IWC) adopted the commercial moratorium on commercial whaling in 1982, coming into effect for an indefinite duration in 1986, the Japanese government lodged a valid objection to that decision. However, its interest in fish catches temporarily overrode that in whale meat when it wished to engage in fishing under license within what, under the forthcoming new Law of the Sea, would become US waters; the price of this preference was to accede to the US demand that Japan withdraw its objection to the moratorium. Japan then immediately engaged in its new "scientific" whaling program, having noted that Iceland appeared, at least for the time being, to have gotten away with a similar ruse without too much diplomatic trouble (Holt 1999).

The important thing about this history is that when Japan was killing whales under commercial catch limits, the Japanese authorities supported very little scientific study of the carcasses before butchery—they simply collected the minimum information required by the IWC: length, sex, and sexual condition, as well as some waxy earplugs for age determination and samples of stomach contents. Once the decision had been made to evade the IWC moratorium by issuing large numbers of special permits, on a profitable scale, scientific justification had to be constructed.

The ICRW requires that "whales taken shall be so far as practicable processed and the proceeds shall be dealt with" under rules to be set by the permitting government. This requirement, like some other regulations under the ICRW, such as the prohibition of factory ship operations in tropical and subtropical waters, was directed against wastage and did not imply commercialization. Products from some whales taken in earlier years, by many countries, were usually not sold on the open market. But in any case, the ICRW provision was certainly not written with the idea that funds from product sales would constitute a

major financial contribution to continuation of the “research,” as Japan has arranged from the beginning. Failure to understand this is a failure to grasp that the commercialization of the products from what the IWC once-upon-a-time quaintly listed as “scientific whales” is essentially aimed at maintaining the market in existence, and the public demand for whale meat, in the expectation of a modification of the moratorium.

Since beginning the research program, the Japanese authorities have changed the declared objectives several times. At first it was claimed that the “sampling” would provide better estimates of the natural mortality rate of the minke whale, which was thought at the time to be necessary for management. Analyses of the proposed methodology, discussed in the IWC’s Scientific Committee (SC), showed that this objective could not be met.

Then the ground shifted to other parameters of population models. But by then the SC had devised and agreed upon a revised management procedure (RMP), which does not depend on any particular population model and does not require precise estimates of the parameters of any of them (Cooke 1995, de la Mare 1998, IWC 1999). Thus the SC advised the commission that the Japanese program provided no information relevant to management of any future whaling under the RMP. Then, briefly, the Japanese authorities claimed that they would in some undefined way help improve the efficiency of the RMP, but in the absence of specifics this claim fell on stony ground.

Meanwhile, with reduced state subsidies in sight, two new developments were needed to keep the industry going: to expand the “research” from the Antarctic to the North Pacific (so that the factory ship and its fleet of catchers could work more economically year round) and to begin taking “samples” of other species, such as the Bryde’s whale and the sperm whale. To justify this action, yet another rationalization was needed, and it was found in the claim that world fish catches have been declining, at least in part because fish and other marine living resources of

interest to humans are being consumed in vast quantities by whales, which are supposedly increasing fast under protection. (It is worth noting that the sperm whale is completely protected under an IWC decision independent of the 1982 moratorium, but the scientific exemption nevertheless applies to it, too. Furthermore, there is as yet no evidence that the species populations being targeted for "science" have been increasing.) So more stomach contents must be examined, despite the fact that it is now possible to determine the diet of whales, like that of elephants, from samples of feces.

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*The law of the sea does not authorize unsustainable exploitation of predators in order to enhance catches of prey species. On the contrary, it requires that fisheries for prey species be regulated in such a way as not to adversely affect the reproduction of predators.*

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The idea that whales must be "culled" to reduce competition was put forward by Japanese government scientists in the 1980s as part of the campaign against the moratorium. The first story was that the blue whale in the Antarctic was not recovering from near extermination because of competition from minke whales, which, like the blue whales, eat mainly krill (Euphausiidae). That argument, which was never taken seriously by other scientists, collapsed in the 1990s when it was revealed that the Soviet fleet had been catching blue whales, which were supposedly protected, and falsifying the statistics on a huge scale (Brownell et al. 2000, Chernyi 2000, Yablokov 2000). Now whale culling (i.e., unsustainable use of the whale resources)

is being promoted to save the world's fisheries and even to enhance world food security! Such unscientific nonsense is being touted by the Japanese delegations at every United Nations and international meeting on the subject of future food supplies.

Since Aron, Burke, and Freeman defend the lawfulness of the Japanese permit-whaling program, they perhaps could also note that the law of the sea does not authorize unsustainable exploitation of predators in order to enhance catches of prey species. On the contrary, it requires that fisheries for prey species be regulated in such a way as not to adversely affect the reproduction of predators. It should also be noted that resolution of questions about the interspecific consequences of protecting predators such as cetaceans and pinnipeds will not come merely from looking at stomachs, but rather from calls for a much enhanced understanding of the dynamics of complex ecosystems (UNEP 1999). The Japanese research program contributes in no measure to that understanding, and, of course, it is not intended to do so. Instead, propaganda is limited to guesstimates of how much whales consume overall and to the absurd presumption that what whales would not eat if they were culled would accrue to anglers instead of to other marine predators (Tamura and Ohsumi 2000).

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#### References cited

- Brownell RL Jr, Yablokov AV, Zemsky VA. 2000. USSR pelagic catches of North Pacific sperm whales, 1949–1979: Conservation implications. Pages 123–130 in Yablokov AV, Zemsky VA, eds. Soviet Whaling Data (1949–1979).

- Moscow: Centre for Russian Environmental Policy Marine Mammal Council.
- Chernyi EI. 2000. Several strokes to an image of the Soviet whaling. Pages 25–30 in Yablokov AV, Zemsky VA, eds. Soviet Whaling Data (1949–1979). Moscow: Centre for Russian Environmental Policy Marine Mammal Council.
- Cooke JG. 1995. The International Whaling Commission's revised management procedure as an example of a new approach to fishery management. *Developments in Marine Biology* 4: 647–657.
- de la Mare WK. 1998. Tidier fisheries management requires a new MOP 5 (management-oriented paradigm). *Reviews in Fish Biology and Fisheries* 8: 349–356.
- Holt SJ. 1999. Whaling and international law and order. *Marine Pollution Bulletin* 38: 531–534.
- [IWC] International Whaling Commission. 1999. The revised management procedure (RMP) for baleen whales. *Journal of Cetacean Research and Management* 1 (suppl.): 251–258
- Tamura T, Ohsumi S. 2000. Regional assessments of prey consumption by marine cetaceans in the world. Cambridge (United Kingdom): International Whaling Commission Scientific Committee. IWC Doc. SC/52/E6 (unpublished).
- [UNEP] United Nations Environment Programme. 1999. Protocol for the Scientific Evaluation of Proposals to Cull Marine Mammals: A Report of the Scientific Advisory Committee of the UNEP Marine Mammal Action Plan. Nairobi: United Nations Environment Programme, Greenpeace International, International Fund for Animal Welfare, Worldwide Fund for Nature.
- Yablokov AV. 2000. Consequences and perspectives of whaling. Pages 6–10 in Yablokov AV, Zemsky VA, eds. Soviet Whaling Data (1949–1979). Moscow: Centre for Russian Environmental Policy Marine Mammal Council.

#### CORRECTION

We neglected to give credit to Chris Simon of the University of Connecticut for the upper right photograph in figure 2 of "Temporal Separation and Speciation in Periodical Cicadas," by John R. Cooley, Chris Simon, and David C. Marshall (*BioScience* 53: 151–157). We regret the omission.