

Applying Lessons from Rainforest Protected Areas to MPA Management: Interview with Tom Struhsaker

In a paper published in the May 2005 issue of the journal *Biological Conservation*, biologist Tom Struhsaker of Duke University (US) wrote that the most successful rainforest protected areas in Africa are those with a combination of characteristics, including public support, strong law enforcement, large size, and low human population densities nearby. His research, involving a survey of dozens of scientists and managers at 16 African parks and wildlife preserves, also concluded that investment in economic development around parks — such as for agriculture or ecotourism — does not necessarily correlate with park success in meeting conservation goals. In fact, he said, success in development programs can draw more people to a region and thereby increase stress on protected areas.

Although Struhsaker cautions that his study should not be viewed as definitive, he says its lessons may be applicable to other types of protected areas — including, potentially, MPAs. Below, *MPA News* talks with Struhsaker about the implications of his research for protected areas in general. His paper, “Conserving Africa’s rain forests: problems in protected areas and possible solutions”, was co-authored by Paul Struhsaker and Kirstin Siex (*Biological Conservation*, Vol. 123, Issue 1, pp. 45-54) and was supported by the Center for Applied Biodiversity Science, a program of Conservation International.

MPA News: In your paper, you suggest that the success of a protected area depends in part on the level of public support for that site. How can human attitudes and values be influenced to the benefit of protected areas?

Tom Struhsaker: This is one of the most difficult and important questions confronting the majority of protected areas (PAs) everywhere, and the answers will surely differ among cultures and over time. Many adhere to the idea that conservation can be bought. Our studies and numerous others indicate otherwise. Indeed, economic incentives can often assist in generating the initial interest in conservation but, ultimately, this is unlikely to succeed because (a) the majority of people always desire more and (b) populations continue to grow. More lucrative and destructive options usually prevail.

My view is that the most effective conservation happens when a significant segment of the neighboring human population practices an ethic that respects other species and the need for conserving intact ecosystems. Although our results did not show a strong correlation between conservation education and PA success, I continue to endorse the idea that conservation education in some form must be fundamental to changing behavior and attitudes. Clearly, there is need for detailed study of this issue.

MPA News: In successful PA management, how important is the relationship between park management and the community?

Tom Struhsaker: Certainly, good relations between park management and the neighboring community are vitally important. We emphasize, as well, that there are other ultimate factors that influence PA success, including human population growth and levels of consumption per capita.

While there may not be a single strategy for achieving good working relationships between PA management and the neighboring community, two of the African park wardens I interviewed and worked with offered some relevant advice. Their message was that you cannot and should not try to buy off the local community. Simply throwing money at them will not solve the problem nor win their cooperation. Instead these wardens felt that park authorities should strive to be good neighbors with the local communities. This involves frequent meetings with the local community to discuss each other’s problems. The critical part of this relationship is that good neighbors help one another within the limits of their abilities and resources. In other words, it is a two-way, give-and-take process.

While this approach may not work in every culture, it certainly worked well for these two wardens and is a process worthy of consideration in general. One outstanding advantage of this approach is that it attempts to remain current and flexible, thereby allowing for changes in human demography, culture, economics, climate, and environment.

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Struhsaker *et al.* paper is online

The Struhsaker *et al.* paper “Conserving Africa’s rain forests: problems in protected areas and possible solutions” is available in PDF format at http://www.baa.duke.edu/FacPages/conserving_africas.pdf.

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MPA News: What advice would you give a PA manager on how to make his or her protected area effective?

Tom Struhsaker: There is no single set of strategies that will work for all PAs nor for any given PA in perpetuity. Management practices must be flexible and adaptable according to local circumstances, including changes over time. Ecological monitoring programs are critical

to evaluating the successes and failures of PA management practice and must be a fundamental and ongoing component of PA management. Without them, there is no objective way of determining the success of the PAs or of anticipating and understanding problems within the PA. In this regard, there must be full collaboration and understanding between managers and scientists. 

Hawai'i Resource Managers Propose State Marine Reserve for NWHI

The board responsible for managing natural resources for the state of Hawai'i (US) has approved a proposal to designate a no-take marine reserve in all state waters of the Northwestern Hawaiian Islands, or NWHI. Boundaries of the proposed 2645-km² NWHI State Marine Refuge would extend three nautical miles from the islands and atolls of the archipelago (excluding Midway Atoll, which is a national wildlife refuge and not part of the state). Nearly all extractive activity, including commercial and recreational fishing, would be banned. The exception: allowance of traditional practices of Native Hawaiians, which could include limited harvest.

For the reserve to take effect, the proposal must now receive approval from various state officials, including the state governor. Chairman Peter Young of the Board of Land and Natural Resources says he expects final approval in the coming months. "We want to get this implemented as soon as possible," he says. The proposal reflects two rounds of public hearings over three-and-a-half years. The 25,000 public comments generated by the hearings overwhelmingly favored no-take zones, says Young. An earlier state plan to designate the waters as a fishery management area — allowing some commercial fishing — was retracted due to public opposition.

NWHI waters, including those under federal jurisdiction, contain roughly 70% of all US coral reefs. The largely uninhabited NWHI archipelago stretches westward from the main Hawaiian Islands for more than 1200 miles (roughly 2000 km).


"Do no harm"

The ban on recreational fishing in the proposed refuge includes the use of catch-and-release methods. Young says this is partly due to the remoteness of the area, which would make enforcement difficult: it would be a challenge to monitor the activities of each fisherman to see whether he was releasing his catch back to the water. Nonetheless, Young expects the reserve to have little effect on current NWHI fishing activity, including commercial fishing. Although a small number of commercial vessels target bottomfish species in federal

waters of the NWHI, seaward of the three-mile state boundary, there has been little commercial activity in state waters since the mid-1990s. Recreational fishing is uncommon due to the remoteness of the islands.

Under the proposed regulations, any entry into the reserve — including by Native Hawaiians, as well as scientists and educators — would require a state-issued permit to do so. Furthermore, all permitted activity must "do no harm" to the ecosystem.

Stephanie Fried, senior scientist with Environmental Defense, an NGO, applauds the "do no harm" principle established for the reserve and the willingness of officials to take a strong preservationist stand. "It takes an act of significant political courage to withdraw the flawed plan initially proposed by the state and to seek additional input from the public," she says. Cha Smith, executive director of KAHEA, a local alliance of Native Hawaiian cultural practitioners and environmental activists, says the proposed rule "reflects the economics, existing law, science, Native Hawaiian rights, and broad and consistent public sentiment."

Meanwhile, federal NWHI waters beyond the state's marine boundary are undergoing their own management review process. These waters, designated in 2000 by former President Bill Clinton as the 340,000-km² NWHI Coral Reef Ecosystem Reserve (*MPA News* 2:6), contain several no-take zones but allow fishing elsewhere. Under consideration for re-designation as a marine sanctuary under the nation's National Marine Sanctuary Program (NMSP), the area's regulations could be altered to be more restrictive — that is, completely no-take — or less restrictive. Young says the state is working with NMSP and other federal partners in hopes of establishing a "seamless management regime" for all NWHI waters. Legislators might also get involved: US Congressman Ed Case of Hawai'i has introduced a bill to Congress (the NWHI National Marine Refuge Act of 2005) that, if passed, would designate the entire federal reserve as a no-take area. This would create the largest no-take area in the world. The text of that bill is available in PDF format at <http://www.house.gov/case/NWHI%20NMR%20Act.PDF>. 

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MPA Perspective Science, Participation, and Politics in MPA Management

By Nancy Dahl-Tacconi, University of Queensland

Once upon a time, there was a young MPA lost in the first review of its management plan. The plan, drafted in a rush five years earlier by an understaffed management agency, had led to conflicts between management and stakeholder groups. Displaced fishermen, arguing for a smaller no-take zone, wanted social and economic costs to be considered in the new plan: “You need to involve us more in decision-making,” they told the managers. Conservationists, arguing for a larger no-take zone to protect an endangered species, told the managers, “You need to base your decisions on science, not politics.”

What would you advise the managers to do?

Many management agencies face pressures like these. Stakeholders are often dissatisfied with prior management decisions, which they view as not having considered the relevant environmental or social systems. There seem to be two distinct themes in society’s reaction to this discontent: a push for science-based management and a movement toward more participatory decision-making processes. There are benefits and limits to each approach. I propose that these two approaches should be applied together, not separately.

The term “science-based management” is used frequently in policies and scientific publications on MPAs, as well as other fields of resource management. Proponents claim that this approach is implicitly more rational and objective than other strategies — thus, more capable of delivering acceptable decisions. The concept emphasizes the need for rigorous examination of natural and social conditions to increase understanding and capacity to make better decisions. The underlying assumptions are that rigor leads to transparency and that better scientific knowledge leads to better management decisions. (Other stakeholders may disagree.)

If “science-based management” means that decisions are justified primarily on the basis of scientific knowledge alone, there are at least three reasons why it may be neither feasible nor desirable practice:

- Management that involves complex interactions among natural and social systems is not a technical problem easily framed by the ways we have tended to do science. Reducing complex problems into component parts tends to produce results that are detached from the actual management context. Alternatively, methods aimed at investigating multiple interactions concurrently are difficult to ground in scientific theory.
- Science does not necessarily enable consensus on policy choices; on the contrary, continuous debate on methods and results is desirable in scientific institutions because it provides quality control and maintains credibility.

- Public demand for more responsible decision-making processes cannot be satisfied by switching from one type of authoritarianism to another, which is essentially what happens by shifting decision power into the hands of scientific experts. With regard to managing public resources, decision-making processes that are not inclusive or deliberative are increasingly unacceptable in democratic societies.

These points highlight the gap between scientific reasoning and political reality in decision-making. Experienced practitioners understand that good decisions come from more than just good science. The decision-making process includes framing the management problem; developing objectives; creating alternative options; assessing risks; making trade-offs; considering uncertainties; and planning ahead. Most of these steps require political tact as well as reliable information.

Where public demand requires more transparency in decision-making, practitioners are increasingly turning to a range of participatory processes, ranging from one-way communication to more interactive dialogues and shared decision-power. Proponents assert that participatory processes are critical to uncovering and interpreting a diverse pool of information that comes from natural and social sciences — in addition to informal knowledge about social and cultural norms, local language, historical experiences and technical practices. Participatory processes are also promoted to facilitate mutually acceptable decisions when a variety of interests are involved. If done well these processes can lead to increased awareness and appreciation for different value systems. The underlying assumption is that the most acceptable decision is the most appropriate and sustainable one. (Some scientists may disagree.)

Participation can also be expensive and time-consuming. In addition, it risks hardening inflexible positions if information is not free-flowing, if interactions are not well-facilitated, or if participants are not committed to the process.

Both scientific knowledge and participatory processes are desirable for improving management effectiveness. Neither is adequate in isolation. Finding a way to merge the two approaches, to take advantage of the strengths of each, involves processing multiple sources of information in a complicated social context with multiple value systems and multiple conflicting interests. This is not an easy task.


A promising alternative for improving management decisions comes from the business world. Rational negotiation, which makes use of interactive participation and a range of information sources, can lead to creative

Editor’s note

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solutions that are both acceptable and sustainable. Negotiating rationally involves focusing on interests rather than positions and exploring integrated alternatives rather than tug-of-war. When managers and stakeholders negotiate this way, information — scientific or not — is used jointly to forge a common path forward rather than as ammunition to defend opposing positions. It is an approach that integrates scientific reasoning and political reality rather than segregating them. 

More on rational negotiation

For readers who want to learn more about rational negotiation, Nancy Dahl-Tacconi recommends these books:

- Bazerman, M. H. and M. A. Neale. 1992. *Negotiating Rationally*. Free Press.
- Keeney, R. L. 1992. *Value-focused Thinking: A Path to Creative Decision Making*. Harvard University Press.
- Raiffa, H., J. Richardson and D. Metcalfe. 2002. *Negotiation Analysis: The Science and Art of Collaborative Decision Making*. Belknap Press.

MPA News poll:

In decision-making for MPA management, what role should negotiation with stakeholders play? Are there times when decisions should be based primarily on natural science with less consideration of stakeholders' socioeconomic concerns ... or vice versa? Please e-mail your responses, with "Poll" in the subject line, to mpanews@u.washington.edu. We will print responses.

Notes & News

IMPAC1 update: availability of financial assistance for attendees

Financial assistance to individuals to help reduce their cost of attending the First International Marine Protected Areas Congress (IMPAC1) — to be held this 23-28 October in Geelong, Australia — has been made available through a grant to the congress from the David and Lucile Packard Foundation. To qualify, applicants must be from one of the geographic areas of interest to the foundation: the Gulf of California (Mexico); Palau; the Federated States of Micronesia; Papua New Guinea; the Solomon Islands; Fiji; Indonesia; and the Philippines. For more information on applying, visit the IMPAC1 website at <http://www.impactcongress.org>. Later this month, the website is expected to announce the program of 160 international speakers invited to present in the concurrent congress sessions.

Project on precautionary principle invites input

An IUCN initiative to determine best practices for use of the precautionary principle in natural resource management is sponsoring an online consultation from 7-19 June to invite perspectives on the subject. (The precautionary principle states that action to protect the environment may be necessary before scientific certainty of harm is established.) The online consultation is inviting contributions from anyone with experience of, or interest in, the use of the principle, and will occur in the form of a web-based discussion on the project website. For more information, including on how to participate, go to <http://www.pprinciple.net/econference.html>. Participation is free of charge.

Pew Fellows release MPA statement, set percentage goals for no-take zones

No less than 10% and as much as 50% of each marine ecosystem worldwide should be protected as no-take zones, according to a statement on MPA policy released this month by past and current Pew Marine Conservation Fellows, individuals recognized over the past decade for their global leadership in the field of marine conservation. The statement, signed by 38 fellows from 24 countries, is intended to help policy-makers achieve a goal set at the 2002 World Summit on Sustainable Development: the establishment of representative MPA networks worldwide by 2012 (*MPA News* 4:3).

The signatories recommend that policy-makers take several priority actions. The actions focus on local involvement in planning, managing, and implementing MPAs; linking MPAs into networks; evaluating those networks; and taking global action to restore and maintain marine populations, habitats, and fisheries. The Pew Fellows Program in Marine Conservation is administered by the US-based Pew Institute for Ocean Science. The statement on MPAs is available online at <http://www.pewmarine.org>.

Second report available from Millennium Ecosystem Assessment

A massive international project to assess the consequences of ecosystem change for human well-being — the Millennium Ecosystem Assessment (MA) — has released a report measuring the impacts of biodiversity loss worldwide and recommending solutions for slowing that loss, including in marine and coastal environments. The report, *Ecosystems and Human Well-Being*:

Biodiversity Synthesis, suggests that rates of global decline in biodiversity will continue or accelerate unless there is an unprecedented level of governmental and societal action in favor of conservation and sustainable resource use. Such action would need to address such factors as habitat loss, climate change, invasive species, overexploitation, and pollution. The report recommends several actions to take, including creation of a global MPA network, adoption of ecosystem-based management for MPAs, and incorporation of biodiversity conservation in fisheries management.

The MA was initiated in 2001 under the auspices of the United Nations and is governed by a multistakeholder board including representatives of international institutions, governments, indigenous peoples, NGOs, and business (*MPA News* 5:2). More than 1300 scientists from 95 countries have contributed to the assessment. The biodiversity report is available in English, with summaries available in other languages, at <http://www.millenniumassessment.org/en/products.aspx>.

Report offers snapshot of initiative to build learning network among Western Pacific MPAs

An initiative to help locally managed marine areas (LMMAs) in the Western Pacific benefit from the collective experience of their practitioners has released a report detailing the progress achieved toward project goals and the challenges faced so far. Those challenges, according to the recently released *2004 Annual Report* of the LMMA Network, include difficulties involved in data management and the coordination of participants and projects dispersed across eight time zones. Begun in 2000, the LMMA Network involves 70 sites so far in Southeast Asia, Melanesia, Micronesia, and Polynesia,

with a mix of traditional leaders, conservation staff, and others (*MPA News* 5:8). The overarching goal of the network is to determine the conditions under which LMMAs work in practice. The annual report and more information on the network are available at <http://www.lmmanetwork.org>.

Reports: Effects of climate change and chemical contamination on Arctic ecosystems

The WWF International Arctic Programme has released two reports detailing human-related threats to Arctic ecosystems: one on climate change (*2° is Too Much: Evidence and Implications of Dangerous Climate Change in the Arctic*) and one on chemical contamination of wildlife (*The Tip of the Iceberg: Chemical Contamination in the Arctic*). These concurrent threats — along with invasive species, habitat destruction, and other factors — illustrate some of the challenges involved in fully protecting even remote ecosystems. The reports are available in PDF format at http://www.panda.org/about_wwf/where_we_work/arctic/publications/index.cfm.

Links to updates on tsunami assessments

Scientists continue to assess the damage caused by the December 2004 tsunami in the Indian Ocean. Below are links to updated information:

ReefBase database of tsunami literature

http://www.reefbase.org/References/ref_literature.asp?keyword=tsunami&searchactive=yes&Submit=search

IUCN Tsunami Taskforce

<http://www.iucn.org/tsunami/resources/iucn-reports.htm>

Conference Calendar — July '05

4-7 July — **12th Southern African Marine Science Symposium (SAMSS 2005)**. Durban, South Africa. Web: www.ori.org.za/samss12.html

7-9 July — **People and the Sea III: New Directions in Coastal and Maritime Studies**. Amsterdam, Netherlands. Web: www.marecentre.nl/people_and_the_sea_3/index.html

11-14 July — **29th Larval Fish Conference**. Barcelona, Spain. Web: www.larvalfishcon.org/Conf_home.asp?ConferenceCode=29th

11-15 July — **Australian Society for Fish Biology Annual Workshop and Conference**. Darwin, Australia. Web: www.territorylive.com/asfb2005/

15-17 July — **Workshop: Building A Global Strategy for Establishing Representative Networks of Marine Protected Areas by 2012**. New Orleans, USA. E-mail: Lynne.Mersfelder@noaa.gov

15-19 July — **19th Annual Meeting of the Society for Conservation Biology**. Brasilia, Brazil. Web: www.scb2005.unb.br/

17-21 July — **Coastal Zone '05: Balancing on the Edge**. New Orleans, USA. Web: www.csc.noaa.gov/cz/

25-29 July — **Third International Fishers' Forum**. Yokohama, Japan. Web: www.fishersforum.org/

For an updated calendar of more than 60 MPA-related conferences around the world, go to www.mpanews.org.

MPA News

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Letters to the Editor

Georges Bank scallops and fishery closures

Dear *MPA News*:

I am writing in response to Russ Babcock's query regarding the effects of long-term closures on Georges Bank sea scallops, *Placopecten magellanicus* (*MPA News* 6:10). As discussed below, while scallop abundance and biomass have increased substantially within the closed areas, there is no clear evidence indicating that the closures have enhanced recruitment or landings in the areas remaining open to fishing.

Three large areas on Georges Bank and Nantucket Shoals were closed to groundfish and scallop gear for most of the time since December 1994. The closed areas historically accounted for roughly half of the total sea scallop landings and recruitment in the US portion of Georges Bank before the closures. While these areas can be considered MPAs, they do not qualify as no-take marine reserves: a number of fishing activities have occurred there since they were closed. Most relevant to sea scallops is the substantial ongoing fishery in the closed

areas for American lobster (*Homarus americanus*), a known scallop predator, and limited re-openings of portions of these areas to scallop fishing (first from June 1999 to January 2001, and again since November 2004).

Fishery-independent scallop surveys indicate rapid increases in sea scallop biomass and abundance in the closed areas through 2000, with roughly steady abundance and modest increases in biomass since then. Closed area biomass in 2004 was about 31 times greater than in 1994, while abundance increased about nine times during that period. Closed area biomass and abundance in 2004 were about 18 and five times greater than their long-term 1982-1994 pre-closure means.

Biomass of sea scallops in the open portions of the US Georges Bank population in 2004 was about six times its value in

1994 and three times its 1982-1994 mean. Open area abundance in 2004 was about five times its 1994 value and 1.3 times its 1982-1994 mean. Effort reduction measures (days-at-sea reductions and crew size limitations) and gear restrictions have been implemented gradually in the US sea scallop fishery since 1994. These measures, by reducing fishing mortality and shifting the selectivity of the fishery toward larger animals, would be expected to increase scallop biomass and abundance, so that increases in these numbers in the open areas cannot necessarily be attributed to the closures. Because the exchange of adult scallops between open and closed areas is negligible, any putative contribution of the closed areas to the improved conditions in the open areas would be from increased recruitment. Comparison of open area log-transformed recruitment ("recruits" are defined as two-year old scallops, that are at least a year away from being vulnerable to the fishery) for year classes spawned prior to the closure (1980-1994) to those spawned afterwards (1995-2002) shows an 8% non-significant increase ($p=0.61$; $t=0.51$) in recruitment in the post-closure period. Recruitment observed during the most recent three surveys, when biomass in the closed areas has been the highest, has been below average.

Total US Georges Bank landings in the pre-closure period (1982-1994) were about 23% higher than those in the post-closure period (1998-2004; 1998 is the first year that a positive "spillover" effect from the closures could have affected the fishery). By contrast, recent sea scallop landings in the Mid-Atlantic area (from Virginia to Long Island) have been well above average, and this region has attracted most of the scallop fishing effort during the last few years. There have been no long-term closures in the Mid-Atlantic region. Instead, there have been rotational closures as well as the effort reduction and gear restrictions discussed above.

It is clear that the Georges Bank closures were effective in rapidly increasing sea scallop abundance and biomass within these areas. However, current evidence is inconclusive as to whether the closures have increased sea scallop recruitment in the areas open to fishing. Moreover, even assuming that the observed slight increase in open area recruitment is due to the closures, it appears to be insufficient to compensate for the direct loss in yield caused by long-term closures. Rotational closures, by increasing yield per recruit in addition to possible benefits from increased fertilized egg production, are much more likely to improve scallop yield than permanent closed areas.

Deborah Hart

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Galápagos and sportfishing

Dear *MPA News*:

Last month's issue of *MPA News* described the pressure being placed on the Galápagos Marine Reserve to permit the business of sportfishing in its waters (*MPA News* 6:10). Compared to the shark finning that occurs illegally in the reserve and the growing calls among local artisanal fishermen to allow longlining, the prospect of developing a catch-and-release sportfishery might seem relatively benign to some. But it is not an "either/or" scenario. Allowing sportfishing would add yet another layer of pressure to an already-stressed marine environment in Galápagos. Furthermore, the management infrastructure necessary to control this new fishery is not in place. The International Game Fishing Association, which sanctioned the illegal billfishing tournament in Galápagos this past February, is in a powerful position to take a stand in the battle to protect the marine resources there. I would like to see IGFA state that it would not be in the interest of Galápagos resources to open up the sportfishery at this time.

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