

MPA News

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Bahamas to Create No-Take Reserve Network to Protect Fisheries, Fishermen

The government of the Bahamas has announced a plan to create five no-take reserves in its waters this year — the first step in a process that could eventually close 20% of the country's marine environment to fishing, according to scientists and NGOs in support of the plan.

Announced on 13 January, the government plan designates five sites for no-take reserve status, based on a ranking of more than 30 candidate areas. The chosen sites, paired with the Bahamas' sole existing no-take reserve, would set aside roughly 4% (800 km²) of the country's marine environment as no-take areas, according to an estimate by the Bahamas Reef Environmental Education Foundation (BREEF), an NGO that initiated the reserve-creation effort. Supporters of the plan, including the science team charged with recommending sites, have encouraged the government to enlarge the nascent network in coming years to comprise one-fifth of Bahamian waters.

The government, represented by the Bahamian Department of Fisheries, has so far set no boundaries for the five reserves, pending consultations with local communities. Details, too, on the reserves' assessment and management of resources have yet to be worked out, though officials expect to rely on local communities to enforce the reserves' fishing ban.

The primary purpose of the reserves will be to protect the Bahamas' fish populations, which scientists have described as being generally healthy but showing signs of overconsumption and degradation. Through such protection, the reserves will provide long-term support for the fishing industry and the dive tourism sector.

"These reserves are as much social and political measures as they are fisheries management tools," said BREEF Chairman Nicholas Nuttall.

Building a Network

A US-based team of scientists with experience studying the Bahamas' marine environment helped the Bahamian government select the five sites, using a scoring system

that ranked all candidate sites according to ecological and socioeconomic criteria (see box, page 2). The system ranked highest the sites considered to have both high ecological significance and positive (or neutral) socioeconomic effects if set aside as reserves.

The five proposed sites are North Bimini, the Berry Islands, South Eleuthera, the Exuma Cays, and the Northern Abaco Cays. Fishing pressure varies among the sites, with the Berry Islands and the Northern Abaco Cays serving as popular fishing grounds. The Berry Islands are the only site of the five that currently serves as a major spawning ground, including for conch, grouper, and sponges, according to Nuttall.

Not all of the five sites ranked high on the science team's ecological scorecard. The Bahamian Department of Fisheries reportedly selected the Northern Abaco Cays site due to strong community support for its protection, though the site scored relatively low for regional importance. The Department selected the

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North Bimini site — also not a high scorer for regional importance — for the nearby location of a shark research station, the presence of which could simplify monitoring and enforcement.

Ideally, said officials, the country's proposed no-take network would eventually be one link in a chain of reserves stretching beyond Bahamian waters. A network of no-take reserves, spread along the so-called Bahamian Archipelago from the Dominican Republic northwestward to the Bahamas, would allow the latter to continually replenish its living marine resources, with larvae spawned both inside and outside of Bahamian waters.

Supporters of the Bahamian plan say the work to protect the country's fisheries won't be complete until other countries join in the effort. "This is by no means the end of the story," said Kathleen Sullivan Sealey, a biologist from the University of Miami (Florida, US) who advised on the reserve-selection project. "There are 16 coastal

systems in the [Bahamian] Archipelago. I have no doubt that these areas are ecologically important to the Bahamas."

Enforcement

The Department of Fisheries will have to rely on local communities to control fishing in the reserves, as the government has just one patrol boat, which it uses to enforce seasonal reserves at grouper spawning aggregation sites. The reliance on locals will depend upon wide public acceptance of the reserve plan, including by fishermen. Michael Braynen, the Bahamian Director of Fisheries, said he has observed public support for the reserve plan, though not everyone is behind it.

"I do expect outright opposition by some people in local communities to the proposed reserve areas," said Braynen. "In some cases this opposition will be based on their concerns about not having been involved earlier in

The Site-Ranking System

The science team that ranked candidate sites for the Bahamian government used a scoring system that awarded points based on socioeconomic and ecological criteria. The system was as follows:

Socioeconomic Criteria

- A. Fishing Impact
 - 1 point = Major displacement of fishing activity
 - 2 points = Minor displacement of fishing activity
 - 3 points = Negligible displacement of fishing activity
- B. Community Management
 - 1 = No community nearby and no existing park
 - 2 = Community nearby but support uncertain
 - 3 = Supportive community nearby or existing park
- C. Community Benefits
 - 1 = Both non-consumptive benefits and spillover effect (of fish from reserve) negligible
 - 2 = Minor non-consumptive benefits and/or spillover effect
 - 3 = Major non-consumptive benefits and/or spillover effect

Ecological Criteria

- A. Habitat Diversity
 - 1 = Habitat sparse or degraded by human activities
 - 2 = Healthy reef or seagrass/mangroves (not both)
 - 3 = Both healthy reef and seagrass/mangroves
- B. Regional Importance
 - 1 = Negligible potential source of larvae for the Bahamas (NE corner of the Bahamas — the Bahamas' net prevailing current runs from the southeast to the northwest)
 - 2 = Minor potential source of larvae for the Bahamas (NE end of the Bahamas)
 - 3 = Major potential source of larvae for the Bahamas (SE half of the Bahamas)

The team calculated the overall score for each candidate site by averaging the site's individual socioeconomic score, averaging its individual ecological score, then adding those two averages. The resulting "priority score", therefore, could range from 2 (lowest priority) to 6 (highest priority).

The science team's principals were Allan Stoner of the US National Marine Fisheries Service, Mark Hixon of Oregon State University (US), and Craig Dahlgren of the Center for Marine Conservation, a US-based NGO.

the process. For some, this is something that the government never gets right, regardless of how early it's done." He added that other communities would view the reserve plan as favoring "foreigners" — including tourists, land owners, and scientists — or threatening locals' income or access to a food source. No official estimate exists for the reserves' expected short-term economic costs to local fishermen, though long-term benefits are expected to outweigh those costs.

"Obviously a great deal of our educational efforts will have to be directed toward demonstrating to the local communities that the reserves are being established for their benefit," said Braynen.

The science team's Mark Hixon of Oregon State University (US) said that voluntary compliance was the only way marine protected areas would work in developing nations. "Public education at all levels is essential, from formal education in the schools to fisheries extension officers hosting community workshops," said Hixon. By fostering a sense of community ownership of the reserves, he said, locals would be able to say, "This is our reserve, we enforce compliance, and we reap the benefits." He cited examples where he said community-based management had worked for MPAs, including in Samoa (King and Faasili, 1999, *Fisheries Management and Ecology*, 6:133-144) and Hawaii ("West Hawaii Council Approves Fish Management Areas", *MPA News*, 1:1,5).

Existing Reserve at Exuma Cays

Notwithstanding seasonal no-take zones set up to protect grouper spawning aggregation sites, the present no-take reserve in the Bahamas is in Exuma Cays Land and Sea Park, in the central Bahamas. The Exuma Cays reserve covers 456 km².

According to the University of Miami's Sealey, the Exuma Cays reserve has not resulted in more fish outside the park, for two reasons. She cites an increase in the park's yacht tourism level — from 500 "boat nights" in 1984 to over 17,000 "boat nights" in 1998 — as creating a parallel increase in recreational fishing pressure. The tourist-driven fishing pressure has caused a 30%-60% decrease in large grouper numbers in waters surrounding the park. Second, the reserve might not be sufficient to protect large, long-lived species, such as groupers, that leave the park for spawning. Sealey said recent research on the home range of groupers, combined with population studies, should help indicate the size of reserves necessary for grouper protection.

It remains to be seen, following consultation between the government and local communities, whether the fishing ban at the newly proposed five sites will include restrictions on recreational fishing.

Tips from the Bahamas on Designing Reserves

The science team for the Bahamian site-selection project offered the following tips, among others, on reserve design:

State explicit goals, including both socioeconomic and ecological perspectives.

Make the reserve permanent. Previous experience has shown that reserves are rapidly decimated when opened, due to disproportionate targeting by fishermen. The benefits of no-take reserves accrue from their permanence.

Include a mixture of habitats for target species, including areas for larval settlement, juvenile survival and growth (nursery habitat), and adult activities (especially spawning).

Locate reserves close to fishing grounds for maximum benefit from the spillover effect.

Avoid areas with non-fisheries environmental problems, including heavy development of nearby land areas, pollution, sedimentation, and habitat degradation.

(Adapted by *MPA News* from "Scientific Review of the Marine Reserve Network Proposed for the Commonwealth of the Bahamas by the Bahamas Department of Fisheries," July 1999, by Allan Stoner, Mark Hixon, and Craig Dahlgren.)

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Council Calls for Several New No-Take Reserves in Australian State of Victoria

An advisory council to the Australian state of Victoria has released a draft recommendation that the state create a system of "highly protected" marine areas (i.e., no-take reserves) to protect fish breeding areas and other key habitats. The draft recommendation, if followed, would increase Victoria's total no-take area from 0.05% of the state's waters to over 6%.

The Environment Conservation Council (ECC) of Victoria offered the recommendation in a draft report, which is now open for public comment. The ECC advises the Victorian government on the use of public lands, with the goal of balancing the competing needs of resource users and the environment.

Specifically, the ECC's draft report names sites suitable for the creation of 12 "Marine National Parks", 11 "Marine

ECC Draft Report Is Online

An electronic copy of the Environment Conservation Council's draft report is available online, at <http://www.nre.vic.gov.au/ecc/index.htm>.

Sanctuaries", and 15 smaller "Marine Special Management Areas". [For definitions of each of these terms, please refer to the box on this page.] The Marine National Parks and Marine Sanctuaries would be no-take reserves, and, as recommended by the ECC, would cover 630 km² of Victoria's marine environment.

The draft report's public comment period ends 25 February 2000. The ECC will offer its final recommendation to the state government on 30 June 2000.

Reaction

Environmental NGOs offered their support for the direction of the draft recommendation, though they had hoped for a larger percentage of Victoria's waters to be set aside as no-take reserves.

"We hoped to get 12-15% protected, but 6% is a good start," said Amanda Martin, director of the Victorian National Parks Association, which led NGOs' efforts on this issue. "It will still be a major battle to ensure that the government accepts this figure. Our recreational and commercial fishers are up in arms."

To solicit public input, the ECC has held more than a dozen public meetings across the state, where 25% of the nation's human population resides. Shane Dwyer, ECC executive director, said views at the meetings had ranged from strong support for the draft recommendation to absolute opposition, although the meetings as a whole had generally carried a negative tone.

"While there are arguments for reserving more than 6%," said Dwyer, "the [ECC]'s view is that the current recommendations provide a reasonable balance when coupled with good management practices in the remaining area. Given the difficulties in getting to this stage, it is likely to be some time before the matter [of increasing the percentage] is revisited." Dwyer added that the ECC had never pursued a particular target percentage.

The ECC estimates that the value of Victorian commercial fisheries in the recommended Marine National Parks — which would constitute the bulk of the new no-take areas — is approximately Aust \$5.5 million/year (US \$3.45

Glossary of ECC Terms

Below is a glossary of terms, excerpted by *MPA News*, from the Environment Conservation Council's draft report (*Marine Coastal & Estuarine Investigation: Draft Report for Public Comment*):

Marine National Parks are highly protected areas which contribute to a system representing the range of marine environments in Victoria, and in which no fishing, extractive or damaging activities are allowed. There are no restrictions on access, and activities such as recreation, tourism, education and research are encouraged. [Editor's note: The draft report is unclear on the legislative process by which the state of Victoria would establish a national park.]

Marine Sanctuaries are smaller highly protected areas designated for protection of their special natural values, in which no fishing, extractive or damaging activities are allowed.

Marine Special Management Areas are smaller areas designated (formally through legislation or through other management arrangements) for protection of their special natural values, in which fishing and other uses are generally allowed.

The ECC draft report also calls for the renaming of five large, existing multi-use marine areas as **Marine Conservation Parks**.

million/year), based on historical yields. That would represent 5%-10% of the state's various fisheries. In its report, the ECC also recommends creation of a system of 15 "Marine Aquaculture Areas", totaling about 125 km², to boost regional economies.

No-Take Reserves, Not Multi-Use Zoning

The proposed protected areas would be managed by the Victorian Department of Natural Resources and Environment (NRE), according to the ECC. Fisheries Victoria would have a role in enforcement of the no-take provisions and the overall management of fisheries within the protected areas.

The ECC intended for its site selection to be representative of the state's five marine bio-regions, sampling the habitats that occur in each one. Dwyer said that several groups and individuals had nominated sites for consideration, though the nominations had not constituted a formal process. The ECC modified its list of sites to take account of various factors, including socioeconomic matters (e.g., impact on fishing), access, educational opportunities, shipping, and overall balance. There was no scoring system used to rank sites.

The ECC's draft recommendation departs from recommendations made in the mid-1990s by the Council's

predecessor, the Land Conservation Council (LCC). The LCC had proposed the creation of large multi-use marine parks (covering up to 20% of Victoria's waters) with, in almost all cases, a no-take core.

The ECC now states in its draft recommendation that it "is persuaded that large multiple-use marine parks, in which fishing and harvesting and extractive uses are permitted in most of the zones, send confusing messages to the community about the purpose of the parks. In order that the purpose of the parks can be clearly communicated and the management regime simply explained and implemented, a system of highly protected marine national parks is proposed. Monitoring of the performance of the parks will also be simplified."

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Reader Feedback on Nomenclature

In the last issue of *MPA News* (December/January), we initiated a discussion on the topic of MPA nomenclature. We reprinted the IUCN's and national definitions for "marine protected area", and provided a list of terms that had previously appeared in the newsletter to describe MPAs. "Ecological reserve", "highly protected zone", and "fish replenishment area" were some of the examples. At the end of the article, we solicited feedback on the topic from readers.

Below is one of the responses we received. We thank our contributors and welcome further responses by e-mail at mpanews@u.washington.edu. We look forward to printing more submissions in future issues. (Opinions expressed in the following letter are those of the author, and not necessarily of *MPA News*.)

Kapu Zones

Jim Bohnsack, National Oceanic and Atmospheric Administration (US)

While Shakespeare noted that "a Rose by any other name would smell as sweet," a variety of names would still be confusing. My problem with the IUCN classification [for protected areas] is that it focuses on MPA goals and not on process. Thus, a "no-take reserve" would be of high value for science (IUCN category Ia), wilderness (Ib), ecosystem protection and recreation (III), land/seascape conservation and recreation (V) and support sustainable use of surrounding areas (category VI).

The value of the no-take (no-extraction) definition is that it describes a high level of protection and is objectively defined by prohibiting activities (processes) with the "intent of extraction", except in a few special cases needed for scientific and education purposes as recommended by Ballantine (1997).

Note that no-extraction differs from no-consumption. While pollution, human presence, diving, anchoring and other non-extractive uses can "consume"

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resources, the physical extraction of resources is not intended and the measurable impacts in most cases are usually orders of magnitude below those of extractive activities.

All currently used English terms have too many meanings and too much cultural baggage to be really internationally useful. "Sanctuary", derived from Spanish, would come the closest to describing no-take reserves but it has been corrupted by the U.S. Sanctuaries Act which created a "sanctuary" program with areas that are not sanctuaries in traditional usage.

I suggest that the best term to describe no-take zones in an operational sense is the Hawaiian word "kapu". When "discovered" by Capt. James Cook, Hawai'i had an extensive network of no-fishing, or

kapu, zones in which violation of kapu was considered a serious offense punished by death. Kapu offers the positive meaning in terms of protection without the detrimental connotations of the "no-" modifier. The appropriate punishment for violating a kapu zone is another discussion.

Reference: Ballantine, W.J. 1997. "No-take" marine reserve networks support fisheries. *Developing and Sustaining World Fisheries Resources: The State and Management*, pp. 702-706, D.A. Hancock, D.C. Smith, A. Grant, and J.P. Beumer (eds.), in 2nd World Fisheries Congress, Brisbane, Australia.

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