MPA Enforcement: Practitioners Employ Mix of High-Tech and Community-Based Strategies

For a marine protected area to be able to meet its goals, resource users must comply with its regulations. Achieving such compliance from users can be a constant challenge for MPA practitioners. Managers with narrow budgets generally must rely on public-education techniques to build community support for the MPA. Larger budgets allow for greater surveillance and policing.

MPA practitioners are developing new techniques and using new technologies for addressing the challenges of compliance and enforcement. This month, MPA News surveys several managers and planners to ask what methods they are using to ensure that MPA regulations are followed.

Enforcement in the world's largest MPA

Australia's Great Barrier Reef Marine Park presents some monumental enforcement challenges. Roughly 344,000 sq. km in area -- about the size of Japan -- the marine park offers countless remote places where resource users might be tempted to disobey its multi-use zoning scheme. The marine park's several overlapping jurisdictions also pose the threat of bureaucratic confusion, potentially leading to enforcement loopholes.

Rising to meet these challenges is the marine park's Day-to-Day Management Program, which guides the park's field operations and routine activities. The program devotes one-third of its AU $8.5 million (US $4.4 million) annual budget to surveillance and enforcement activities. Air and sea patrols operate in the marine park on a daily basis: the program makes more than 100 charter surveillance flights per year, and its 10 vessels each average more than 200 days at sea annually.

The program's surveillance and enforcement efforts are the result of extensive coordination among agencies. The Day-to-Day Management Program itself is a joint effort of the Great Barrier Reef Marine Park Authority (GBRMPA) and the Queensland Parks and Wildlife Service (QPWS). Providing critical services for surveillance and enforcement are the Queensland Boating and Fishing Patrol, the Australian Coastwatch and Customs services, and commonwealth and state police services.

"A very strong culture of cooperation has been established between these agencies and GBRMPA," said CPWS' Peter McGinnity, director of the Day-to-Day Management Program. "The high level of cooperation is largely attributable to the fact that agencies see mutual benefit resulting from the cooperation." At peak periods, for example, agencies might have staffing limits that would restrict their ability to mount a patrol; by "cross-decking" (combining personnel), staff from other agencies can fill out a crew. Also, interagency cooperation allows for access to a broader range of equipment and expertise, which can be particularly valuable in mounting larger targeted operations.

The marine park's surveillance and enforcement efforts rely fundamentally on risk assessments to identify the probability of illegal activities occurring, weighted by the potential impact of those activities. Citing a 42% one-year increase in park-related prosecutions in the 1999/2000 financial year, McGinnity attributed it to a targeting of patrol effort at high-risk activities and an increase in overall patrolling effort.

Tracking fishing vessels by satellite

To observe violations and enforce regulations, MPA practitioners have historically had to be on site, in the MPA, to witness the illegal behavior. This is no longer the case for some. Fisheries management agencies of several countries have adopted vessel monitoring systems (VMSs) to track the paths of fishing vessels moving in and out of closed areas. In the US, the technology is actually being used to catch vessels in the act of illegal fishing.

A VMS works this way. At regular intervals, a small transmitter unit on a vessel sends a signal to a satellite. The satellite interprets the signal's time and position, then relays the data to a computer on shore, often located at a fisheries management agency. The agency computer plots the location data points and compares each vessel's location to closed areas. Using the distance traveled between reports, the computer also calculates the vessel's speed, which can indicate its activity. In the

northeastern US scallop fishery, for example, a speed of greater than 5 knots primarily indicates the vessel is in transit. A speed of below 5 knots primarily indicates the vessel is fishing or shucking its catch.

The US National Marine Fisheries Service (NMFS) has required the 270 boats of the Northeast's limited-access scallop fishery to carry VMS units since 1998. Each boat's monitoring system also has e-mail capability, which the vessels are required to use to report daily catch information back to shore. When the NMFS Northeast Region computer indicates that a vessel is illegally fishing in a closed area, it automatically sends an e-mail to the vessel, notifying the captain of the observed breach. Often, according to NMFS computer specialist Mike McSherry, the captain will e-mail back with an explanation; sometimes the explanations are legitimate, sometimes not. "I can usually tell," said McSherry.

The 24-hour monitoring capability of VMS is what makes the system so useful, said Bob Harman, VMS manager for the NMFS Southwest Region, which covers California, Hawaii, and Pacific territories. "Even if no one is here in the office, the system's still working." The Southwest Region requires VMS units to be carried on the Hawaiian pelagic longline fleet, which is particularly well-suited for tracking. A longliner's set is a 16- to 17-hour fishing event that provides a distinctive "signature" on the NMFS computer screen: two long parallel lines of location points, with the first indicating the laying-out of the longline and the second indicating its retrieval.

"Because of VMS, we think we know about 95% of the violations that occur in the Hawaii longline fishery," said Paul Ortiz, senior enforcement attorney for the Southwest Region. Incidentally, the response of the NMFS Southwest Region to a violation is different from the Northeast Region's. When longliners are observed via VMS to be fishing in a closed area, the Southwest Region sends a Coast Guard vessel or plane to take photographs of the infraction, providing additional evidence against the vessel.

The fishing industry's response to VMS has been somewhat mixed. The sensation that government is constantly looking over the fisher's shoulder is unpopular. The technology can also be somewhat pricey: although the Hawaiian longline vessels have received their VMS units for free as part of a government pilot project, the Northeast scallop vessels had to purchase their units, which cost about US $6000 to purchase and install per vessel, plus $100/month to operate. However, the monitoring systems also offer some benefits to fishers. Systems with e-mail capability allow fishers to keep in touch with other parties besides fisheries managers. In addition, VMS data have been used to exonerate vessels falsely accused by officers of illegal fishing. And VMS can serve as a safety device, informing rescuers of the location of a vessel in distress.

Live video from an MPA

Another high-tech method of observing activities in an MPA is offered by the website "www.racerocks.com", which offers real-time video of the Race Rocks archipelago in British Columbia, Canada. The waters surrounding Race Rocks are in the process of becoming Canada's first marine protected area under the national Oceans Act (MPA News 2:4). The Race Rocks website, managed by Garry Fletcher of Lester B. Pearson College, allows visitors to operate a remote-control camera for a panoramic view of the Race Rocks area. The remote-control camera, as well as several stationary cameras that also feed video to the website, are each stationed on the main island of the small Race Rocks archipelago.

The cameras -- primarily intended to help monitor wildlife and educate visitors about Race Rocks -- have had the side effect of being a surveillance tool. The Department of Fisheries and Oceans has received e-mail messages from visitors to www.racerocks.com notifying the department of illegal activities observed around the islands.

While such video capability may hold promise for MPA enforcement in the future, Fletcher plays down its importance to Race Rocks. "What should be emphasized is that having cameras is important not so much for surveillance, since that is a rather negative term, but rather for monitoring," he said. "With monitoring, we are able to establish the patterns of normalcy in the MPA so that when disruptions occur we can deal with them. Also, if people through their association with the web pages and cameras become more attuned to the values of a protected area, then I think we have gone a long way to ensuring the area's sustainability."

Angus Matthews, Pearson College's administrator and director of special projects, said the permanent presence of two human "eco-guardians" stationed on the archipelago's main island has been essential to ensuring compliance. The guardians, financed by the college, approach violators by boat to discuss infractions. However, added Matthews, it has been the high level of community support for Race Rocks that has offered the biggest inducement for compliance. "Local divers, eco-tour companies, and sportfishers have all voluntarily developed their own best-practice codes or agreed to significant limitations on their activities," he said.

Now Fletcher and Matthews are faced with finding funding to continue Pearson College's efforts with the eco-guardian station, the website, and other Race Rocks-related expenses. "The project will be broke on March 1, 2001," said Matthews. "This will be the fourth near-death experience [due to funding] for our efforts at Race Rocks in the last five years."

Community support and enforcement

Strong community support for an MPA makes the job of enforcement cheaper and easier. However, a community's skepticism of enforcement efforts can be a critical factor in eroding local confidence in a management authority. On the island of Roatan, Honduras, poor and middle-income islanders have expressed concern that enforcement and management in the Sandy Bay-West End Marine Reserve have been skewed against them.

In a case history published in *Marine and Coastal Protected Areas: A Guide for Planners and Managers, Third Edition* (IUCN, 2000 -- reviewed in <u>MPA News 2:4</u>), Nelia Forest of the University of California-Berkeley (US) writes that Roatan's poor residents perceive they are being asked to restrict environmentally damaging activities while the activities of powerful residents continue unchallenged. Subsistence harvesters of conch, fish, and lobster in the reserve have been fined; meanwhile, houses and roads continue to be built on steep slopes next to reefs, and marshes are filled for real estate development. In one survey of locals, more than 50% expressed concern about ineffective management of the reserve and the need for stronger, more equitable measures.

An initiative coordinated by the Wildlife Conservation Society (WCS), a US-based NGO, aims to help rebuild community support for the reserve. With funding from the US Agency for International Development and Fundacion Vida of Honduras, WCS is providing technical assistance in preparation of a new, participatory management plan. By early 2001, the plan is expected to be submitted for final approval to the Honduran government by the Bay Islands Conservation Association (BICA), the local NGO that shares management authority for the reserve with the national government.

At the core of the upcoming management plan are recommendations to make reserve decisionmaking and enforcement more transparent and inclusive, involving resource users such as fishers and the dive industry. The plan also calls for the participation of a broad array of stakeholders on a new local management committee for the reserve; such committees are now required for all parks and reserves under new Honduran protected area regulations passed this year.

Even with approval of the new plan, it could take some time to build adequate support and trust among islanders for the reserve's management. "Resolving the problems of managing the Sandy Bay-West End Marine Reserve is a challenging and long-term task," writes Forest.

Voluntary MPAs

Could the compliance of resource users ever be so good that there would be no need for enforcement? Managers in island-based San Juan County of the northwestern US state of Washington are exploring that possibility. In 1998, in response to community concerns about declining rockfish and lingcod stocks, a county committee established eight small "bottomfish recovery zones" (BRZs), all of which are closed to bottomfishing on a voluntary basis. The committee sited each BRZ in an area that was historically a good fishing site but had since declined in catch-quality. Signs on shore notify fishers of the BRZs, which extend about 400 yards (366 meters) from the shoreline.

The voluntary basis of the BRZs was established for several reasons, according to Kari Koski, coordinator of Soundwatch, an NGO that is contracted to manage the county's bottomfish recovery program. First, the county doesn't have jurisdiction over its coastal waters; that jurisdiction resides with the state of Washington. Second, said Koski, the voluntary aspect fits well with the nature of the local islanders. "The islanders prefer not be told what to do, but they'll do what they know is right," she said. Third, if compliance were mandatory, an enforcement presence would be necessary to make it work.

As it is, Soundwatch maintains a regular educational presence in the BRZs, said Koski. With a US $70,000 annual budget, Soundwatch sends a boat out to visit the zones at least four times each month, particularly during seasons and times when recreational fishers are most likely to be active. The Soundwatch officials approach users in the zones and instruct them on the bottomfish recovery program. "We've found that one-on-one contact with people right when they're hoping to fish is effective," said Koski.

There have been only a few -- perhaps three -- non-compliant individuals, she said. "They know us, we know them," said Koski. One individual operates a fishing charter boat that frequents one of the BRZs in particular. Koski said that operator is now experiencing peer pressure to obey the BRZs from the local port authority and residents. The large majority of local fishers have complied with the BRZs, she said, because they recognize that the fish they've been catching in recent years have grown smaller and smaller.

Notably, there are many non-voluntary MPAs in the San Juan Islands managed by state and federal agencies, including 83 national wildlife refuge sites. Although the refuges feature signage, there is no enforcement presence, and trespassers are frequent. Koski said, "It's great that the refuges are there, but the islander community does not really treat them as refuges." Assisted by some federal funding, Soundwatch has added the refuges to its visitation list.

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