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# COMMUNITY CAPACITY BUILDING IN THE DESIGNATION OF THE TORTUGAS ECOLOGICAL RESERVE

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**ABSTRACT** The remote Tortugas region of the Florida Keys, located over 225 km from the continental United States, is an area of high coral diversity, excellent water quality, and productive fisheries. Located at the juncture of major ocean currents, the Tortugas potentially serves as a source and sink for marine larvae. The Florida Keys National Marine Sanctuary initiated a process in 1998 to create a fully protected ecological reserve in the Tortugas to conserve these resources. Reserve design emphasized community input and consensus-based decision-making. Critical to success was a diverse working group of stakeholders and government agencies. In July 2001, after receiving extensive public comment and the necessary agency approvals for designation, the Sanctuary implemented a 518-km<sup>2</sup> Tortugas Ecological Reserve. This fully protected marine reserve is expected to preserve biodiversity, maintain ecosystem integrity, and act as a reference site to discriminate between natural and anthropogenic changes to the ecosystem. The Tortugas Ecological Reserve complements the Sanctuary's existing network of 23 fully protected zones, instituted in 1997 to protect marine resources from overuse, conserve biodiversity, and separate uses. The Tortugas Ecological Reserve is the largest fully protected marine reserve in the United States.

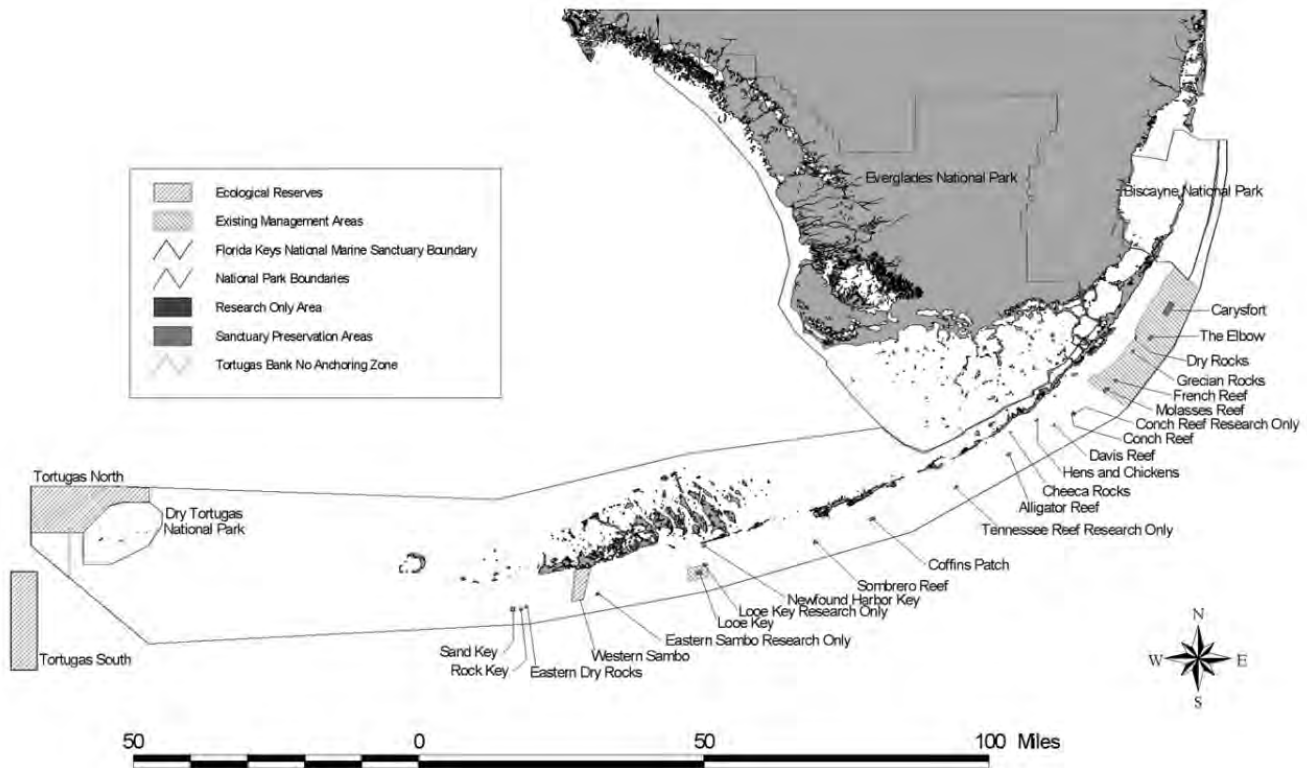
## INTRODUCTION

The Florida Keys are a 356-km island chain located at the southern tip of Florida, in the southeastern United States. The marine environment of the Florida Keys includes mangroves, seagrasses, hardbottom communities, patch reefs, and the third largest bank-barrier coral reef system in the world. Significant degradation of the Keys' marine environment is the result, in part, of dramatic population growth throughout south Florida. Improperly handled wastewater and stormwater contribute to the degradation of nearshore water quality (Kruczynski 1999), seagrasses and corals are destroyed by boat groundings (Causey et al. 2000), and serial overfishing of dozens of key species has depleted reef fish biomass and spawning potential (Ault et al. 1998, PDT 1990). Non-consumptive activities, such as snorkeling and SCUBA diving, also place significant pressures on coral reef resources that are exacerbated by the over three million visitors to the region annually (Leeworthy and Vanasse 1999).

In an effort to address these many complex threats and provide comprehensive protection to the region, the Florida Keys National Marine Sanctuary (FKNMS or Sanctuary) was designated in 1990 by an act of the United States Congress (FKNMSPA, Pub. L. 101-605). The National Oceanic and Atmospheric Administration (NOAA), under the US Department of Commerce, administers the FKNMS and other National Marine Sanctuaries. The FKNMS encompasses over 9800 km<sup>2</sup> of coastal and oceanic waters and submerged lands (DOC 2000), and is managed under a cooperative agreement between the State of Florida and NOAA. The purpose of the FKNMS

is to ensure sustainable use of the Keys' marine environment by achieving a balance between resource protection and multiple, compatible use of those resources (DOC 1996). A comprehensive management plan for the Sanctuary was published in 1996 and implemented in 1997 that outlines specific strategies for marine resource conservation and protection. One of these strategies, marine zoning, is used in the Sanctuary to protect diverse habitats important for maintaining natural resources and ecosystem functions, while allowing some activities to continue.

The zoning network established by the Sanctuary was the first of its kind in the nation. Five zone types include twenty-three individual, fully protected areas, implemented in 1997 (Figure 1). An ecological reserve, one zone type, was proposed for the remote Tortugas region of the Sanctuary during the draft management plan process (1995) but was not adopted because of insufficient natural and socioeconomic data and a resulting lack of community acceptance for the proposal. The original proposal was dropped, but NOAA committed in the final management plan for the Sanctuary to implement an ecological reserve in the Tortugas region after a thorough review and analysis of the area (DOC 1996). To ensure that the unique habitats of the Tortugas were fully protected and to address the myriad of burgeoning threats in the area, the FKNMS initiated the design of the Tortugas Ecological Reserve in 1998. The reserve process was dubbed "Tortugas 2000", and was designed to apply lessons learned and overcome the challenges encountered during the development of the original marine zoning plan for the Sanctuary.



**Figure 1. The marine zoning plan for the Florida Keys National Marine Sanctuary. Ecological Reserves, Sanctuary Preservation Areas, and Research Only Areas are fully protected zones. The new Tortugas Ecological Reserve (Tortugas North and Tortugas South) is shown in the far left (west) of the map.**

**METHODS**

**The Tortugas 2000 Planning Process**

Tortugas 2000 was a three-phase process that began in April 1998 with the design phase (Phase I). Phase I culminated in June 1999 with the citizens’ Sanctuary Advisory Council (SAC) recommending a preferred boundary for the Tortugas Ecological Reserve to NOAA. In Phase II of the process, a Draft Supplemental Environmental Impact Statement/Supplemental Management Plan was completed in May 2000 to describe the proposed reserve, solicit public comments on the proposal, and fulfill National Environmental Policy Act mandates. Phase III involved the completion of a Final Supplemental Environmental Impact Statement/Final Supplemental Management Plan (FSEIS/SMP) in November 2000, responding to public comments received during Phase II, and developing federal and state rules to implement the reserve.

At the core of Tortugas 2000 was a 25-member working group comprised of diverse interests that were represented by SAC members, stakeholders, and government agencies. The Working Group was composed to ensure that all constituents and agencies with an interest

in or concern over activities in the Tortugas were present during the design phase. A key agency partner was the National Park Service due to their trusteeship of the Dry Tortugas National Park (DTNP), a 259-km<sup>2</sup> park that is surrounded by, but jurisdictionally separate from, the Sanctuary. The Park Service’s involvement in the design of the reserve was critical because of the important shallow water coral reef resources found within the DTNP and the connectivity of those resources with surrounding Sanctuary waters.

The Tortugas 2000 Working Group was charged with reviewing available information to make a recommendation to NOAA on the size, shape, and placement of the Tortugas Ecological Reserve. In partnership with the National Park Service (NPS), a site characterization for the 2642-km<sup>2</sup> Tortugas study area was completed that synthesized oceanographic, fishery, and benthic data from the region. A thorough socioeconomic analysis of all Tortugas users was also completed. The comprehensive site characterization included multiple layers of data displayed graphically using Geographic Information System (GIS), permitting Working Group members to consider ecological and socioeconomic data simultaneously in their deliberations. An ecological forum and

TABLE 1

**Tortugas 2000 Working Group meeting schedule and information provided.**

<b>Date</b>	<b>Meeting Purpose</b>	<b>Information Provided</b>
April 1998	Ecological Forum and setting ground rules for group process (2 days)	–
May 1998	–	Summary of April meeting
June 1998	Socioeconomic Forum (1 day)	Tortugas website available on-line
July 1998	–	Summary of June meeting
September 1998	–	Summaries of Ecological and Socioeconomic Forums
January 1999	–	Resource binder containing Tortugas ecological site characterization, newspaper articles, and other relevant information
February 1999	Criteria development (2 days)	–
March 1999	–	Summary of February meeting
April 1999	Boundary alternative development (2 days)	Site characterization maps of ecology and use data with blank overlays for drafting boundary alternatives
May 1999	Selection of preferred alternative (1 day)	Draft alternatives (12) developed at April meeting

socioeconomic forum, which utilized expert panels to explain features of the region and answer questions, were also hosted for Working Group members and the local community. “Traditional knowledge” experts (fishermen, divers, and others) were invited members of each panel, in addition to scientists and managers. A professional facilitator guided the Working Group, which over the course of 13 months met five times to define operating goals, agree to ground rules, develop and weight criteria for the reserve, evaluate draft boundaries, and make a consensus recommendation for a preferred boundary for the Tortugas Ecological Reserve (Table 1).

### RESULTS

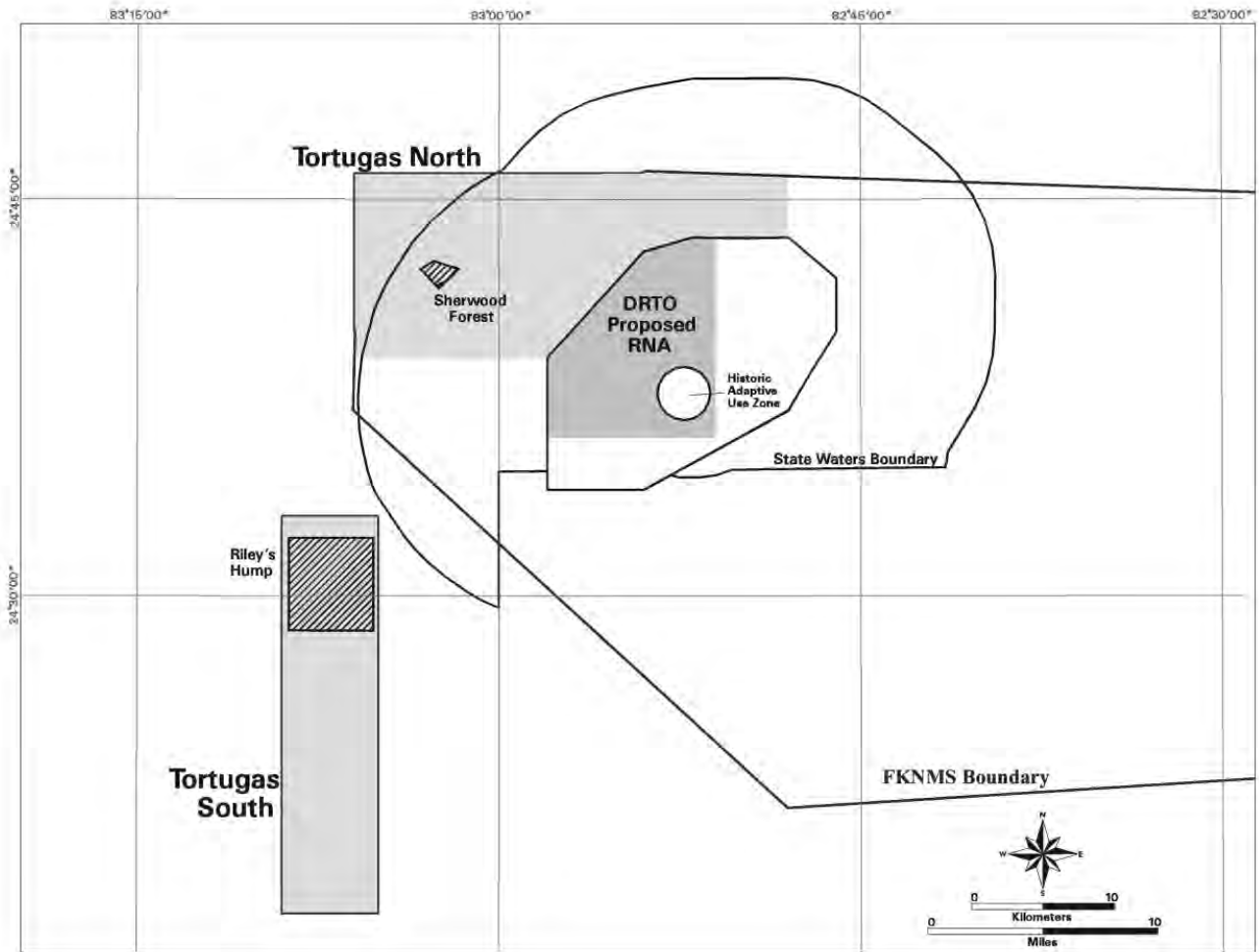
The Sanctuary’s goal for Tortugas 2000 was to create an open and transparent process with multiple opportunities for public engagement. Initially the Sanctuary and National Park Service hosted joint scoping meetings to gather general input on the types of protection needed for the Tortugas. During the official comment period on the Draft Supplemental Environmental Impact Statement/ Supplemental Management Plan (DSEIS/SMP), NOAA gathered more specific input from the public on a set of boundary and regulatory alternatives for the ecological reserve. Thousands of comments received at that time supported the Working Group’s proposal for the Tortugas Ecological Reserve, which was subsequently recommended to NOAA by the SAC. As a result of strong public

and agency support, the Department of Commerce and Governor and Cabinet of Florida approved regulations to fully implement the Tortugas Ecological Reserve in July 2001. Previous approvals from several other agencies with jurisdiction in the Tortugas region had been obtained as well.

The Tortugas Ecological Reserve, as implemented, is a 518-km<sup>2</sup> marine reserve consisting of two sections, Tortugas North (312 km<sup>2</sup>) and Tortugas South (206 km<sup>2</sup>) (Figure 2). Areas of lush coral growth, fish spawning sites, and important deepwater habitats are captured by the reserve. Regulations preserve biodiversity, maintain ecosystem integrity, and facilitate scientific research by prohibiting all consumptive activities and restricting entry to Tortugas South. Due to the Working Group’s recommendation and strong public support for the Tortugas 2000 process, an adjacent shallow water portion (158 km<sup>2</sup>) of the Dry Tortugas National Park was approved as a fully protected Research Natural Area on July 27, 2001, to complement the Tortugas Ecological Reserve.

### DISCUSSION

The success of Tortugas 2000 can be attributed to several factors. Some were the direct result of careful planning by the FKNMS; others were the result of social and political realities. Challenges also plagued some aspects of the process. These successes, socio-political



**Figure 2. The Tortugas Ecological Reserve, implemented on July 1, 2001. The Dry Tortugas National Park's fully protected Research Natural Area (RNA) is also shown.**

realities, and setbacks will be analyzed to enable improved marine reserve design processes in the future.

### Lessons Learned

**Lesson One.** Conduct an open, fair, and transparent process with multiple opportunities for public involvement.

To address concerns that the ecological reserve be designed fairly and equitably, diverse representation of all affected stakeholders was sought in Working Group membership. Members included commercial fishermen from several sectors, recreational and charter boat fishermen, divers, conservation groups, scientists, Florida Keys citizens, and representatives from every agency with management or law enforcement authority in the Tortugas region. The group was expanded to incorporate new stakeholders as they were identified, and members were responsible for communicating input from their constituencies. The Sanctuary constantly reinforced its goal

of achieving a consensus-based recommendation, which likely raised confidence in the process by ensuring that individual dissensions would not be cast aside by a simple majority vote.

Community awareness of and involvement in the Tortugas 2000 process was a top priority for the Sanctuary. Providing a variety of venues for participation proved a successful way to manage and encourage input. Working group meetings were advertised and open to the public. Time was built into the agenda of each meeting for caucusing between Working Group members and constituents that were present. The ecological and socio-economic forums used expert panels of scientists, managers, and citizens with local knowledge of Tortugas resources to deliver information to Working Group members and the public. The expert panels served in an information dissemination role only; they did not provide specific recommendations to the Working Group on reserve size or placement. Also, several panel experts

were Working Group members, which facilitated future discussions on ecological and socioeconomic topics.

The Sanctuary encouraged public input formally through scoping meetings held jointly with the National Park Service in late 1998. The government's National Environmental Policy Act (NEPA) requires that federal agencies proposing major environmental actions provide opportunities for and consider public comments on their proposals before decision-making. Scoping is an initial phase of NEPA that is designed to solicit broad input prior to specific alternative development. Scoping meeting locations were selected to encourage regional and national input. Meetings were structured with a format that used roundtable discussions on specific topic areas with posters describing each proposal. The public was able to offer comments via several methods, including a pre-addressed, postage-paid comment form. The meeting format diffused controversy and facilitated gathering meaningful comments.

The DSEIS/SMP for the Tortugas Ecological Reserve released in May 2000 contained the Working Group and SAC's preferred boundary alternative for the reserve, plus four additional boundary alternatives for consideration by the public. Four regulatory alternatives were also presented. A formal, public comment period followed to solicit specific input on these alternatives. These hearings also followed the roundtable format. Representatives from the NPS and other agencies with authority in the Tortugas region were present to clarify their roles and timelines in the process. Nearly 4000 comments were received from individuals and organizations in Florida, the nation, and the international community during this official comment period, the majority of which strongly supported the Working Group and SAC's alternative for the Tortugas Ecological Reserve. The level and geographic scope of participation suggested that managers should be prepared to respond to and account for regional concerns in future efforts. Overall, success of the Tortugas 2000 process can largely be traced to good community buy-in for the proposal, which spread beyond the local area through media coverage and led to positive feedback from the nation and world.

**Lesson Two.** Have a common purpose and definition of the problem, make a commitment to collaborate, and build trust throughout the process.

Another important lesson is that success may be easier to achieve when the task at hand is clearly defined and members of the planning team are committed to thorough collaboration to achieve that task. The Working Group understood that their discrete charge was to address the FKNMS management plan mandate to create

an ecological reserve in the Tortugas. Initially a purpose, goal, and ground rules were developed for the group and were reiterated at subsequent meetings.

Having a pre-determined study area further moved the Working Group forward in early stages of the process. The entire Tortugas (2642 km<sup>2</sup>) was considered in reserve design, but only this region of the 9800-km<sup>2</sup> Sanctuary was to be evaluated. Most importantly, Sanctuary managers refused to suggest a preferred size or placement for the reserve, avoiding percentages or "ballpark" estimates, given their past experience that early assumptions force stakeholders into a reactive mode. Also, Working Group members were familiar with ecological reserves in the Sanctuary due to one existing area. By adopting the definition of "ecological reserve" in the management plan the group was able to move forward quickly in planning and design. A lesson for other marine reserve initiatives is to consider the starting point of the design group and structure an appropriate timeline. Building trust to ensure full collaboration is also critical. An open and fair process led by a neutral, expert facilitator that assisted in reaching consensus and resolved issues was key to the success of Tortugas 2000.

**Lesson Three.** Provide best available science to the design team and the public, to enable informed decision-making.

Working Group members were provided with a site characterization for the study area that summarized known ecological information on the region. Providing this good science led to understanding and acceptance. For example, excellent oceanographic data on current patterns provided compelling evidence that there was a high probability for larval dispersal and self-seeding from a reserve in the Tortugas. Socioeconomic data was also gathered from over 80% of all Tortugas users (Leeworthy and Wiley 2000). GIS was used to display layers of data simultaneously in an integrated approach that balanced socioeconomic data, ecology, and traditional knowledge, which facilitated additional buy-in and commitment from stakeholders.

Overlapping jurisdictions in the Tortugas necessitated that an ecosystem approach be employed when designing the Tortugas Ecological Reserve. From the outset, Working Group members were instructed to base recommendations on what was best for the ecosystem. The Sanctuary made the commitment to carry forward to the appropriate agencies parts of the reserve recommendation that fell outside its jurisdiction. Having all of the potentially affected agencies on the Working Group facilitated their later acceptance of the proposal.

**Lesson Four.** Build a bottoms-up process that garners upper level support.

Agency support is necessary throughout a reserve design process. Enabling legislation, institutional mandates, and parallel conservation efforts may be required to bring a marine reserve concept to the design and proposal stages. Parent agency endorsement and support are also critical during final phases, when regulations are crafted, approved, and implemented for a protected area. Collaboration at the highest levels of state and federal government throughout Tortugas 2000 was critical in order to obtain the seven necessary agency approvals in a timely manner. Upper level support of a local proposal can greatly facilitate these interagency agreements.

### **Socio-political Realities**

Social and political realities existing at the time of reserve development also contributed to the success of Tortugas 2000. First was that the establishment of the Tortugas Ecological Reserve was the culmination of ten years of work in which the full Sanctuary zone network was developed and implemented. Information from the initial zoning process provided Tortugas 2000 Working Group members with baseline definitions and a study area, significantly reducing their task. Also, local citizens were becoming accustomed to the Sanctuary's existing 23 marine reserves with many reporting positive trends in these areas. Monitoring confirmed no financial losses were being incurred as a result of the zones. Previous lack of involvement led fishermen, especially, to participate in Tortugas 2000 to protect their interests.

Finally, the study area was not in an easily accessible area of the Keys nor was it frequented by many user groups, which kept reserve establishment less controversial than it could have been. Also, efforts by several non-governmental conservation organizations (NGOs) at local, national, and international levels assisted greatly in capacity building, leading to easier consensus at Working Group meetings. Partnerships between agencies leading protected area initiatives and the local conservation community are critical because NGOs have the ability to communicate and garner support in ways that the government cannot.

### **Challenges Encountered in the Tortugas Ecological Reserve Process.**

The challenges encountered during the reserve design and implementation process began with obtaining accurate and thorough ecological and socioeconomic data from Tortugas users. Enlisting fishermen to share knowledge was difficult due to their potential to lose

economically should prime fishing spots be incorporated into the reserve. Information shared by fishermen was given the same credence and attention as that from professional scientists, which may have encouraged trust. Socioeconomic data were gathered using personal interviews with a well-known researcher.

The Sanctuary learned from its previous zoning process that Working Group representatives needed to be well respected within their industry and willing to communicate key information if their constituencies were to feel included in the process. To address this challenge, Sanctuary staff talked with several members of each industry to enlist appropriate leaders for the Working Group. As needed, new members were added to ensure diversity. The addition of new members after the Working Group had been initially convened was not ideal because of the importance of initial trust building between members, but was undertaken as necessary. For example, a Spanish-speaking fisherman was quickly incorporated to the Working Group to represent the significant percentage of Hispanic Tortugas fishermen. Tortugas 2000 materials were produced bilingually and interpreters hired for public meetings. Communicating effectively with this group was a challenge and remains one today on other Sanctuary issues. Overlooking or under-representing a particular user group plagued the Sanctuary even after the Working Group completed their reserve proposal, despite best attempts to be inclusive. Revised impact analyses were completed to address concerns of some businesses late in the process. Opposition of the reserve at the final hour by a well-organized lobby was ultimately diverted by strong public support for, and demonstrated inclusiveness of, the Tortugas 2000 process.

Two final challenges during Tortugas 2000 were building trust within the design team and committing to an ecosystem approach. Working Group members on different sides of the issue expressed concern that the other side would purposefully alter reserve boundaries to protect their interests. Groundwork and trust building completed during previous meetings and an honest discussion led by the professional facilitator diffused these concerns. Lastly, because the final reserve proposal included a significant portion of the DTNP, 265 km<sup>2</sup> of state territorial waters, and 253 km<sup>2</sup> of federal waters, all located outside of current Sanctuary jurisdiction, it was critical that the Sanctuary shepherd these approvals along within their separate agencies to the extent possible. The FKNMS also remained a primary information source for the public, explaining different agency mandates and timelines in implementing those portions of

the reserve that fell outside of the Sanctuary. Again, due to widespread public support for the proposal, the necessary agency approvals were received.

### CONCLUDING THOUGHTS

Marine reserve planning processes have the potential to be controversial within coastal communities. Even if a fully or partially protected area is designated, lack of local support can complicate enforcement and hinder efficacy of the area. Prior experience of the Florida Keys National Marine Sanctuary with its initial zoning plan was used to develop a highly participatory, structured process by which to design and implement an ecological reserve in the Tortugas region. The Tortugas 2000 process highlighted community involvement and shared decision-making, with the best available scientific information and a commitment to a holistic, ecosystem approach at its base. Social, political, and cultural climates of the region were also carefully considered when designing this collaborative process. Tortugas 2000 met with overwhelming support locally and nationally, and resulted in the implementation of this nation's largest, permanent fully protected marine reserve.

### ACKNOWLEDGMENTS

The success of the Tortugas 2000 process and subsequent establishment of the Tortugas Ecological Reserve can be attributed to the commitment of the Tortugas 2000 Working Group, involvement of citizens in the Florida Keys community, and hard work by Florida Keys National Marine Sanctuary and other agency employees. I would most like to acknowledge the dedication of Billy Causey and Ben Haskell of the FKNMS who spearheaded the reserve process, and thank them for the opportunity to participate in such a rewarding marine conservation project. The Tortugas 2000 Working Group facilitator, Michael Eng, is also acknowledged for his efforts to bring a diverse stakeholder group to a consensus decision on the reserve proposal.

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