

## **Bridging the Gap between Conservation, Research, and Communities: A tale from one marine ecologist in the making.**

*“Man wants to see nature and evolution as separate from human activities. There is a natural world, and there is man. But man also belongs to the natural world. If he is a ferocious predator, that too is part of evolution. If cod and haddock and other species cannot survive because man kills them, something more adaptable will take their place. Nature, the ultimate pragmatist, doggedly searches for something that works. But as the cockroach demonstrates, what works best in nature does not always appeal to us.”*

*-- Mark Kurlansky*

Ironically, my interest in the ocean was spurred by a free goldfish. In grade school, I won a small goldfish at the local faire by throwing a ping-pong ball successfully into a fish bowl. From there, I bought the usual bowl, gravel, and fish food kit for my new friend, and this quickly evolved into an infatuation with fishes and aquaria ecosystems. For my thirteenth birthday, my parents bought me a bigger 10-gallon aquarium, fully equipped with a heater, lights, and a variety of new freshwater fishes: guppies, neon cardinals, white clouds, and algae-eaters. I would watch the tank for hours each day with growing enthusiasm, and I was overwhelmed when the bellies of the female livebearers grew and developed a deep red coloration with black dots. I could see the eyes of the unborn fish fry through the mother's thin stomach membrane.

When I graduated from eighth grade, the local fish store offered me a temporary three-month volunteer position (helping with tank maintenance and fish feeding). I was enthralled. They extended this “temporary” position twice, and at age fourteen they offered me an “official” job. This part-time position played a defining role for me as a teenager, and I continued to work there for an additional seven years. I was feeding my passion for fishes (marine and freshwater species alike), and, at the same time, developing my people skills by teaching customers the proper way to care for their new pets. It was not just a job, but the foundation for my lifelong vocation in fisheries management and marine ecology.

If working at the fish store was my foundation, learning how to SCUBA dive amongst the kelp forests of Monterey Bay was my framework. There is something indescribably amazing about breathing underwater; it is like being given a key to a small window or partial access to a porthole of an unknown world. Diving only fed into my addiction to the ocean, and my entire life has been planning accordingly – never too far from the sea. I went on to graduate at the top

of my class at the University of California, Santa Cruz with a degree in Marine Biology (B.S) with an undergraduate thesis entitled, “An analysis of fish structure and behavior during twilight transitions”. This paper summarized the findings of thousands of observations of fish behavior I had collected over many hours spent underwater monitoring fish patterns in Mo’orea, French Polynesia (Society Islands).

After graduation, I got a summer job working as a deckhand on a 65’ one-ton recreational dive vessel that conducted multi-day dive adventures to the Channel Islands. It was here that I developed a new ardor for the seafaring life, and was able to observe first hand, human usage patterns of marine resources, as well as an undeniable connectivity I saw between passengers and the ocean. After a time, I moved to Hawai‘i Island to be closer to family, and to live on the most isolated island chain in the world. There was something undoubtedly appealing about being surrounded by miles and miles of Pacific Ocean blue.

Working in construction to make a living, I spent every weekend camping, diving, and swimming at all the local beaches. Craving something more, I soon got involved as the token marine biologist (volunteering) for a local non-profit community group (*Ka ‘Ohana O Honu‘apo*, or The Family of Honu‘apo). At that time, the group was aiming to help protect 223 acres of precious Ka‘ū coastline, in South Hawai‘i. The fundraising goal was met in December 2005, and the additional acreage was given to the State of Hawai‘i. This unique experience, a rare example of cooperation between the State, County, non-profit organizations (NGOs), community groups, and other individual residents, gave me the inspiration to take my own studies to the next level. I realized that my love of the ocean must be combined with higher education focused on Hawaiian natural history and marine ecology. I am accomplishing this objective via the Tropical Conservation Biology and Environmental Science masters program at the University of Hawai‘i, Hilo. In order to be most effective in the long run, I am now seeking to mesh my ichthyology and ecosystems research with community outreach and education programs.

There is an interesting dichotomy that exists between the need for public participation, and the tendency for science and scientists to remain isolated. Social success of conservation measures, such as Marine Protected Areas (MPAs), hinges on active community input and involvement. A wise Hawaiian friend once told me, that if we encourage an equal voice for all

users, we can closer link people to the environment in need of protection. If social programs are clearly supported by community members (individuals who already have an incentive to protect an area), regulation and cooperation becomes much more feasible. Or as he put it, “every older man is [an] uncle”.

Local support is the first step, and global support is the end objective. Fish do not stay in one place. It is integral to have cooperation within and between all the jurisdictional boundaries. One great example of this is the migrational runs of Atlantic bluefin tuna, *Thunnus thynnus*, across the Atlantic Ocean. An interesting management issue of international scale is created because the United States and Europe have different take regulations on these same fish. The main point here is that we need to unite as a human race (led by the powerful financial backing and leadership of the United Nations, federal governments, and NGOs alike) if we want to be realistic about a sustainable resource management plan that encompasses all the Earth’s oceans.

Population growth and man’s demands on marine resources continue to escalate; however less than 1% of the world’s oceans are currently afforded reserve status<sup>1</sup>. Hopefully, conservation measures such as community-based resource management programs, the implementation of additional large-scale MPAs, incorporation of protection incentives within the fishing business, and financial incentives within the market (such as eco-labeling and ecotourism), will help reduce this growing pressure. For now, the main goal is to present certain areas for protection which minimize short-term sacrifice in order to maximize long-term ocean health and productivity<sup>2</sup>. By furthering marine science community outreach programs, we can encourage community support, appreciation, and concern from all age levels (from elementary school students through senior citizens). Stakeholders must work together as a team to develop successful marine management programs for their individual regions, and we must globally unite these separate working groups with a common purpose. With this coordinated development, protection of the entire ocean system becomes increasingly more realistic.

Consequently, I often ask myself how I fit into all of this. I am currently working to bring the members of a small rural district together to help me convince Hawai‘i County that

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<sup>1</sup> Carr, M.H., Neigel, J.E., Estes, J.A., Andelman, S., Warner R.R., and J.L. Largier. 2003. Comparing marine and terrestrial ecosystems: Implications for the design of coastal marine reserves. *Ecological Applications* 13(1) Supplement: S90 – S107.

<sup>2</sup> National Research Council (NRC), ed. 2001. *Marine protected areas: Tools for sustaining ocean ecosystems*. National Academy Press, Washington, D.C., U.S. 272 pages.

Honu‘apo Bay is an essential fish habitat that warrants legal protection. By next May, I hope to have conducted 52 weeks worth of comparative marine survey data at Honu‘apo and five nearby bays. In addition, I will have completed a hands-on marine science program for the fifth graders at the local elementary school. However, my preservation goals go beyond the waters of the Pacific. I hope to work internationally to bridge the gap between science and communities, between research and applied conservation methods. I will stay in these Islands as long as I am making a difference.

From here, I will go on to acquire a doctorate degree. The exact details for future academic credentials remain undecided. Yet, some tentative educational ideas of mine include: participating in the NOAA sponsored Dean John A. Knauss Marine Policy Fellowship for one-year in Washington, D.C.; or a Ph.D. in Aquatic Ecology from the School of Aquatic and Fishery Sciences, University of Washington; or better yet, a postdoctoral degree in Marine Affairs from the School of Marine Studies, University of the South Pacific, Fiji; or I may even put my second language to use in a *programa de doctorado* in Aquatic Biology from the University of Cádiz, Spain. Regardless of where my studies lead me, I know that I will be working with and for the ocean for my entire career. The fascination that began over a decade ago with a goldfish has developed into my *raison d’être*, or reason for being.