

Honu heroes



Marc Rice uses calipers to measure the length of a turtle's carapace with student assistance at Kiholo Bay.

SPECIAL TO NHN

It is a glorious day at Kiholo Bay.

Eight HPA students — five upper schoolers and three middle schoolers — are busy attending to various tasks at this study site on the Big Island's leeward coast, just 25 minutes away from the school. About half of the students are watching a narrow channel in a pristine lagoon for turtles, while the other students work under a large canopy assisting with weighing, measuring, and collecting data on captured turtles under the supervision of George Balazs, leader of the Marine Turtle Research Program within the Protected Species Division of the National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service, Pacific Islands Fisheries Science Center, and Marc Rice, director of HPA's Sea Turtle Research Program.

On this particular day, the students will capture and study 36 turtles — 12 new and 24 "recaptures."

As he works with the students, Balazs said very carefully the dos and don'ts of working with the turtles. The charismatic and renowned scientist, who has been described as the "honu's best friend," frequently jokes with the students and exchanges friendly banter with Rice. While the mood is light, there is important work to be done and everyone stays on task.

About 1,500 students have participated in the Collaborative Sea Turtle Research Program at HPA since it began in October 1987. At its helm are Rice and Balazs — two men who are passionate about their work, the honu, and the opportunities the program provides for students to gain real-life field experience as they learn about the threatened animal and share their knowledge with others.

Balazs saw his first sea turtle in 1964 while exploring a lagoon in Bora Bora. In 1969, he watched commercial turtle hunters on

Maui land their catch for nearby restaurants catering to Hawaii tourists. He wondered if there really were enough turtles to sustain the growing trade in turtle steak. He started working with turtles doing captive rearing research in 1971 after earning his master's degree in animal science from the University of Hawaii — Manoa. In 1973, his research interests turned to the conservation biology of wild sea turtles in Hawaii and throughout the Pacific region. For the past 35 years — 25 with NOAA — he has pursued an array of studies to aid in understanding and restoring depleted stocks of sea turtles.

Rice joined HPA's science department in 1972 and has held numerous teaching and administrative positions at the school. He holds a master's degree

in marine invertebrate zoology from the University of Hawaii-Manoa and throughout his tenure at HPA, he has shared his love of the ocean with students. His marine biology course is known throughout the state for its emphasis on fieldwork. Scuba instruction is an integral part of that course and has resulted in a multitude of marine-related projects in the field. He currently leads the Academy's science and technology group and also is responsible for the development, scope, and hands-on approach of the school's marine programs. He is an excellent photographer and also holds a United States Coast Guard ocean operators license.

Balazs and Rice obviously "click." After 20 years, their collaboration has resulted in volumi-

nous work relative to the Hawaiian green turtle (*Chelonia mydas*). The two honu heroes clearly share mutual respect and admiration for what the other brings to the program. But Balazs is quick to point out that "without the students, there's no robustness to what we've done."

"The students are budding field technicians; junior scientists who work side-by-side with us and they make it possible for us to do all those things that Marc and I couldn't possibly do with one other person from my staff," said Balazs. "Three of us could do 'x' percent in one day. With five, 10 students, we're able to do 10 times 'x' in a day. Students, under Marc's direction, are the foundation of the program and the magnitude of what we've been able to accomplish can be attributed to

these well-mannered and thoughtful students."

Details about how the collaboration came to be vary ever so slightly, depending on whom you ask. For the record, the school's Sea Turtle Research Program began as an outgrowth of a 1986 field study that included David Gulko, Upper School marine science teacher, Rice (then director of studies), and students Ian McKelvey ('87) and Pat Doyle ('87). The four accompanied students from the University of Hawaii — Hilo Marine Options Program and assisted on a tagging trip to Punalu'u, which was supervised by Balazs, who had been working with the college since the early 1980s. When Rice and Gulko approached Balazs

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about working with high school students in a similar program, Balazs thought Kiholo Bay might be "an excellent place to duplicate what we were doing at Punalu'u."

HPA already had a close relationship with the Hind family, who owned property at Kiholo. Robbie Hind Jr. initially donated \$2,000 to the school for turtle work there and he and his wife, Florence, continued to support the program until they passed away. The program also has been supported by Dr. Earl Bakken and the Bakken Foundation.

The first turtle tagging trip to Kiholo in October 1987 consisted of 15 students who went on a two-night, three-day field study with Gulko, Rice, and Balazs. The group captured six turtles during that expedition.

Rice recalled the early days of the program (1987-1990), when all trips to Kiholo were overnights and the group used kayaks to transport equipment. Students took a 300-foot net with floats and stretched it across the lagoon at night. While the work might not have appealed to the faint of heart, the experience has been the highlight of many taggers who have been there and done that.

Rice gets animated as he describes the night work.

"If there was a turtle in the net, there'd be splashing and the floats would go down and the capture team, five or six designated students, along with an adult, would get the (inner) tube, swim out, get the turtle out of the net, and bring it back," he said. "We would keep the turtles safely in a pen and work on them at first light."



Honu heroes George Balazs (left), leader, Marine Turtle Research Program, NOAA, National Marine Fisheries Service, Pacific Islands Fisheries Science Center, and Marc Rice, director, HPA Sea Turtle Research Program, at Kiholo Bay.

When Guiko left in 1989, biology teacher Monica Traub took over the program. Traub left in 1991 and Rice, who continued to be involved with the program since the beginning, naturally stepped in to direct the program.

"We had no base population of tagged animals, so the first part was just to tag as many turtles as possible," said Rice. A large population of tagged animals would allow researchers to determine growth rates, changes in health status, and migratory behavior, for example, do the animals move up and down the coast or do they stay in the same place.

"There were very, very few animals when we started. We would spend three full days and get seven to 10 animals."

Since those early expeditions in 1987, the program has expanded to include much of the island of Hawaii's leeward coast, from Kawaihae to Honaunau. Today, the turtle tagging excursions are primarily day trips, but Rice has increased the number of student trips, from one to three to up to 10 to 20 per year.

Students have traveled with Rice to the neighbor islands, Midway Atoll, and Nagoya, Japan to assist Balazs with his work. HPA students also have been the only high school presenters at the prestigious annual International Symposium of Sea Turtle Biology and Conservation, which attracts about 1,000 of the world's top researchers and conservationists to such varied event sites as Texas, Florida, Pennsylvania, and Greece.

In addition to accompanying students on all tagging trips, Rice has traveled with Balazs to French Frigate Shoals, American Samoa, Singapore, and Australia to assist with research work. The program also has become more involved with public outreach, doing presentations at various events such as the Kaloko-Honokohau Culture Day, Waimea Festival, Coral Reef Awareness Day, and Turtle Independence Day.

In 1997, Rice expanded the program to include HPA Middle School students. In 2001, he and a group of Upper School students formed a volunteer sea turtle rescue team for west and north Hawaii, in partnership with Balazs' Marine Turtle Research Program. Rice still heads the school's rescue team — one of four in the state

of Hawaii, and the only team of high school students. The team responds to reports from the general public of stranded sea turtles in the area from Honokohau Harbor to Pololu Valley. The school's turtle hotline (881-4200) is open from sunrise to sunset; after-hour emergency calls are taken at 987-6903.

As the program has grown, the students' exposure to researchers and scientists working in partnership with Balazs from around the world has grown.

"Now, our students also are involved in actual student research projects," said Rice. "So that's become much more of a focus on our side."

Student projects include the remote video camera at Kiholo and the recent installation of a remote video camera at Puako. The cameras can be operated by students at the school to study basking behavior of green turtles, eliminating the need to wait for periodic visits to the study sites. Middle School student Meimei Nakahara also is involved in a study of gender-dependent growth rates of Sea Life Park captive-bred juvenile green turtles at the Mauna Lani Bay Hotel.

Another aspect of the work that has changed is the use of technology.

"In the beginning, it was simply a tape measure, calipers, and a scale," said Rice with a laugh. "We'd measure them and weigh them and that was all we could do, basically."

Since the mid-1990s, the program has incorporated the use of technology in unique ways. Apart from computers and remote cameras, the program uses telemetry equipment, such as archival time-depth recorders, which are attached to selected turtles to learn about the animals' diel (daily day and night) behavior — their movements, sleeping, and eating habits. The units record the time, depth, temperature, and date of a particular turtle's movements. Each unit costs about \$1,300 and must be retrieved to read the data, which makes it prohibitive to outfit large numbers of animals.

Satellite tags, such as those used on Nagoya loggerhead turtles since the first release in 2003, transmit data to a satellite and turtle movements can be tracked over long periods of time — from a few months to up to two years, or more. One hundred 67 juvenile loggerhead turtles have been satellite-tagged and released since 2003 and 13 turtles from the 2005 release still are transmitting after 908 days. HPA students Kathy Treacy and Alejandro Horowitz traveled to Nagoya with Rice to assist with the most recent release of 25 turtles in September.

"We're doing things with technology that very few other folks do," said Rice. In fact, the Sea Turtle Research Program continues to be the only program of its kind for middle and upper school students.

Balazs sees the population growth first-hand every time he visits Kiholo Bay. "We caught six turtles over three days in 1987. Today, we go there for four or five hours and we're at 25, 35 turtles and we need to stop because there are so many turtles there that we will overwhelm ourselves with how many we can catch and then adequately, properly handle and collect the data on them."

According to Balazs, the Hawaiian green turtle population, genetically discreet from others in the Pacific and around the world, is one of, if not the best, studied green turtle population in the world. "One of the things to learn is, if our data and impressions are correct, this species in Hawaii has recovered so very well, almost to the apparent possible detriment of themselves," he said. "That's a wonderful model to study, to figure out what's happened. The population has really built up far sooner than we expected, meaning 30 years or so, and now, they're potentially overabundant in some areas. What is the effect of that on the habitat and how

might this be brought into balance? These are intriguing scientific questions."

Another finding, possibly related to the growth in population, is that the turtles' growth rates have declined in many areas compared to what they were back in 1987.

"(The turtles) grow very, very slowly now," said Balazs. "They didn't grow very slowly in the 1980s."

"So when you have less food to go around, it adds fuel to the belief by some of us, that wow, the population has built up really well. That's good, that's great. But it's really built up, maybe, so that it's exceeding the ability of the habitat to support them and that's not quite so good. That's an aspect that needs to be investigated a bit more."

Balazs, who played a major role in getting the honu officially listed as "threatened" under the Endangered Species Act in September 1978, believes that in his lifetime, "it is entirely possible that the special protections of the U.S. Endangered Species Act will be recognized as no longer needed for the genetically-discreet stock of the Hawaiian green turtle."

Should the honu be taken off the U.S. Endangered Species list, Balazs said a different management regime, administered by the state of Hawaii, rather than a federal agency, will come in and "prudently manage the Hawaiian stock of green turtle so the over harvesting and decline, which occurred in the late 1960s and 1970s, will never again be repeated."

In the meantime, current projects include continuing to sample study sites along the leeward coast. At the time of this interview, Balazs was preparing to travel to Honaunau with Rice. "Each year that we add to our database is one year longer in what already are long-term data sets that are rare in the world of sea turtles for sea turtle foraging sites," he said.

From a student perspective, Rice would like to continue getting students involved in conservation issues, not just with green turtles, but the marine environment in general. "Perhaps expanding our scope, continuing to reach out to the community and focusing on some of the environmental aspects and human interactions with turtles because we're going to run into more and more of those issues."

As for the future, Balazs emphatically said, "People make programs. You need to have the right people stepping forward because they will determine what happens in the future. By example, and by history, in some framework, the program will continue."

For more information about the Sea Turtle Research Program at HPA, visit: <http://facstaff.hpa.edu/~mrice/turtle/anniversary.html>