

POINT REYES NATIONAL SEASHORE ASSOCIATION

# *Voices* <sup>at</sup> <sub>the</sub> *Seashore*



## Neubacher Marine Science Fund Grantees



BY ELLEN GREENBLATT

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Juvenile "Dungie" with Ben Walker

Most visitors to Point Reyes National Seashore come for a day hike or camping, for a look at elephant seals or tule elk or, if they're particularly hardy, for a dip in the surf at Limantour. But a whole other group, marine researchers and scientists, visit the National Seashore to learn and help policy-makers inside and outside the Park form science-based decisions about protecting this magnificent resource—and our world.

These scientists and researchers at the Tomales Bay Marine Station (TBMS) at Point Reyes need our help to continue their work.

In addition to donations from the Park Service and private donors for the physical development of the site, an anonymous donation of \$100,000 to what has been named the Neubacher Marine Science Fund now provides grants to researchers each year. Don Neubacher, former Superintendent

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# “We always knew we wanted more science. There’s no future in being pessimistic.”

– Don Neubacher, Former Superintendent,  
Point Reyes National Seashore and Yosemite National Park

of both Point Reyes National Seashore and of Yosemite National Park, notes: “We always knew we wanted more science,” adding, “There’s no future in being pessimistic.”

## Tomales Bay as a Climate Change Refuge

This year’s two Neubacher grantees, studying Dungeness crabs and river otters, exemplify the values and goals both of the park and of TBMS. Their projects show the value of your—our—investment in science and research.

Before entering graduate school at UC Santa Cruz where he is a third year PhD student, 2021 Neubacher Marine Science Fund Grantee Ben Walker spent 5 years at the Bodega Marine Lab studying the endangered white abalone restoration. He became fascinated by the causes of “abalone withering syndrome,” wondering what variable conditions led animals to get so stressed that they would die. Now, working with Dr. Kristy Kroeker at UCSC, Ben will use his Neubacher grant to apply his experience to *“Assessing Juvenile Dungeness Crab Habitat Use to Inform Vulnerability to Global Change.”*

Ben’s skill as a scuba diver and researcher will enable him to look for his juvenile “Dungies,” as he affectionately calls them, in Tomales Bay instead of depending on unreliable nets (“how do you get a net on the sea floor when there is sea grass there?”) and traps, which the baby Dungies are “too small and picky to enter.” Ben’s two-

pronged approach is perfect for the setting at TBMS—he will be in the water to see where the Dungies are and to collect them; then, in the lab, he will expose them to stressors and measure the effects of global change.

What Ben hopes to discover through his research is whether the juvenile Dungeness crabs live in the dense seagrass and to confirm that, since photosynthesis in seagrass beds raises the dissolved oxygen and pH of the water, “seagrass beds in Tomales Bay can ameliorate the effects of climate change and might be a crucial climate refuge for juvenile Dungies that fuel the local fishery.”

## Otter Response to Changed Habitat

Speaking for this year’s other Neubacher Marine Science Fund Grantee, the River Otter Ecology Project, Research Director Terence Carroll started our conversation with a happy story: after the banning of trapping for fur (not until 1961!) and a start to addressing the effects of habitat destruction, river otters began to recover naturally after almost being driven to extinction in the Bay Area.

For their 2021 Neubacher grant, the River Otter Ecology Project will be tackling the unknown as they investigate a current issue: the “Response of Resident North American River Otters to Wetland Restoration at Drakes Beach.” Their grant-funded research will build on their long-term monitoring program showing that, at least

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Photo © Nancy Wright

since 2012, Drakes Beach has been an important area for river otter recovery.

Drakes provides a rich habitat for river otters because otters need both a lot to eat and fresh water for drinking, cleaning their fur and also as an additional source of food. Before the recent wetland restoration work began, river otters “commuted” from the fresh water pond, crossing the beach into the marine environment of Drakes Bay, then foraging all the way out to the area of the Elephant Seal Overlook and Fish Docks. But their return commute did not end on Drakes Beach—when the otters came back to fresh water for drinking and cleaning after feeding in Drakes Bay, their scat affected and nourished the land-based environment.

No one knows how these small—only 3-4 feet long including their tails—animals will respond to the ongoing changes at Drakes Beach.

But, as Research Director Terence Carroll notes, the 2021 Neubacher grant will fund field work and some data analysis as they use the same non-invasive, motion-sensor cameras that informed their pre-restoration research. “We expect the river otters to continue foraging in the marine environment. The question is whether they will still come and go from Drakes Beach as part of that foraging pattern.”

## Informing the Park Service and the World

Trailblazing scientists like Dr. Sarah Allen and Ben Becker, both former Chief Scientists at Point Reyes National Seashore, have led the way over the last decades for younger researchers and scientists like the 2021 Neubacher Marine Science Grantees and the grantees from previous years. TBMS already hosts and provides housing

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for researchers, like some Neubacher grantees, but, with its dock on Tomales Bay, it will also allow high school and college students access to first-hand opportunities to learn scientific methods in the natural systems of tidepools, sandy beaches, mudflats, eelgrass habitats, and the open ocean.

Research is crucial to the preservation of the Seashore, but the implications of specific research projects spread beyond the boundaries of Point Reyes.

As Dave Press, Acting Natural Resources Program Lead and Wildlife Ecologist at Point Reyes National Seashore notes, “We often think of National Parks as being America’s living laboratories, and the Tomales Bay Marine Station provides critical encouragement and support for cutting-edge science at Point Reyes. Research studies in the Seashore help to inform the NPS with day-to-day, science-based management decisions, but also have regional and national implications for a wide range of research topics, particularly species conservation and global climate change. Providing housing quarters at the TBMS for interns and graduate students, and the opportunity to work within the Seashore in collaboration with NPS staff, will help to develop the next generation of NPS managers and leaders.”

This year’s Neubacher grantees, studying the effects of habitat and climate change on river otters and Dungeness crabs, exemplify the kind of research that will “inform the NPS with day-to-day, science-based management decisions” during this time of unprecedented global changes.

## Neubacher Marine Science Fund Grantees 2013-2021

- **Assessing Juvenile Dungeness Crab Habitat Use to Inform Vulnerability to Global Change.** – *Ben Walker, (PhD Student), UC Santa Cruz*
- **Response of Resident North American River Otters to Wetland Restoration at Drakes Beach** – *River Otter Ecology Project*
- **Does Epigenetic Variation Help *Pisaster Ochraceus* (Ochre Sea Star) Survive During Mass Mortality?** – *Lauren Scheibelhut (Post-Doc), UC Davis*
- **Reconstructing Coho Salmon (*Oncorhynchus kisutch*) Provenance and Use of Tomales Bay Via Microchemical Analyses of Salmon Otoliths: A Pilot Study** – *Rachael Ryan (Ph.D. Student), UC Berkeley*
- **Physiological and Behavioral Responses of Northern Elephant Seals to Global Change** – *Ellen Lam (Ph.D. Student), UC Berkeley*
- **Understanding the Consequences of Burrowing Crabs for Plant Community Composition and Restoration in Northern California** – *Janet Walker (Ph.D. Student), UC Davis*
- **Developing a Baseline Food Web of Coastal Ecosystems in Point Reyes National Seashore Prior to Top Predator Recovery** – *Joseph Jackson (MS Student), Sonoma State University*

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# Neubacher Marine Science Fund Grantees 2013-2021

- **The Eelgrass Filter: Effects of Habitat Structure and Predation on Non-native Species** – *Benjamin Rubinoff (Ph.D. Student), UC Davis*
- **Seasonal Food Habits of the North American River Otter (*Lontra Canadensis*) in Tomales Bay and Drakes Bay, California** – *River Otter Ecology Project and Marin Academy*
- **Population Ecology of White Sharks (*Carcharodon Carcharias*) Off Central California** – *Paul Kanive (Ph.D. Student), Montana State University*
- **Rapid Large-Scale Eelgrass Monitoring Using High-Resolution Remote Sensing** – *Max C. N. Castorani (Post Doc), Tom W. Bell (Ph.D. Candidate), UC Santa Barbara*
- **Local Adaptation and the Future of Kelp in Point Reyes National Seashore** – *Jordan A. Hollarsmith (Ph.D. graduate student), Bodega Marine Lab, UC Davis*
- **Restoration Genetics of the Endangered Tidewater Goby, *Eucyclogobius Newberryi*, in Support of Reintroduction and Recovery in and Around Point Reyes National Seashore and Golden Gate National Recreation Area** – *David Jacobs, Professor, UCLA, with two undergraduates*
- **Understanding the Effects of Climate Change and Biological Invasions on Native Oysters in Tomales Bay** – *Jason Sadowski (Ph.D. Candidate), UC Davis and Bodega Marine Laboratory*
- **Seasonal Trends in Kelp-Herbivore Interactions at Point Reyes** – *Nicholas Burnett, Dept. Integrative Biology, UC Berkeley*
- **Does Tomales Bay Pacific Herring (*Clupea Pallasii*) Prefer Eelgrass (*Zostera Marina*) for Spawning? What Does Eelgrass Do for Pacific Herring and Do Predators Gain an Advantage When Eelgrass Populations are Diminished?** – *Hali Rederer (MS Student), Sacramento State University*
- **Self-Recruitment and Population Connectivity Along the Northern California Coast** – *Erin Satterthwaite (Ph.D. Candidate), UC Davis and Bodega Marine Lab*

