Friends of Taunton Bay
Newsletter

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Kelp, The Superstar of Seaweed

By Shep Erhart

Have you ever crossed the Hancock-Sullivan Bridge near low tide and noticed a large patch of golden brown plants ruffling the water's surface, sparkling in the sun? What you're seeing is only a small part of a much larger marine plant that could be 20 feet long. Attached to a mussel bed or rocky bottom by its hand-like holdfast, a long hollow stipe (stem) floats the single broad frond (leaf) towards the surface to catch more light for photosynthesis at low tide.

This is the basic structure and lifestyle of a mature macro algae called Laminaria longicruris (recently reclassified Laminaria saccharina), or commonly known as kelp. Originally kelp was a Gaelic word referring not to the individual plant, but to the pile of ashes obtained from slowly burning many species of large brown seaweeds, including Aescophyllum Nodosum (rockweed) and the L. longicruris that grows in Taunton Bay. These kelp ashes yielded valuable minerals (sodium, potassium, phosphorous, etc.) for nineteenth century industrial use and medical applications (e.g. iodine, a very important early antiseptic).

Kelp, including rockweed, was also traditionally valued as a fertilizer, hauled inland by coastal farmers and furrowed into their fields. In

Photo by Shep Erhart

Kelpers and drying kelp (circa 1971) Photo from Erhart Collection.

the British Isles coastal herdsmen let their cattle, horses and sheep graze on the cast-up kelp, seeing that it made for strong bones, good milk and great fleeces. The first humans to eat kelp were probably Asians, although I recently met a Chilean archeologist who said kelp was found at the base of the Andes in burial mounds many thousand years old.

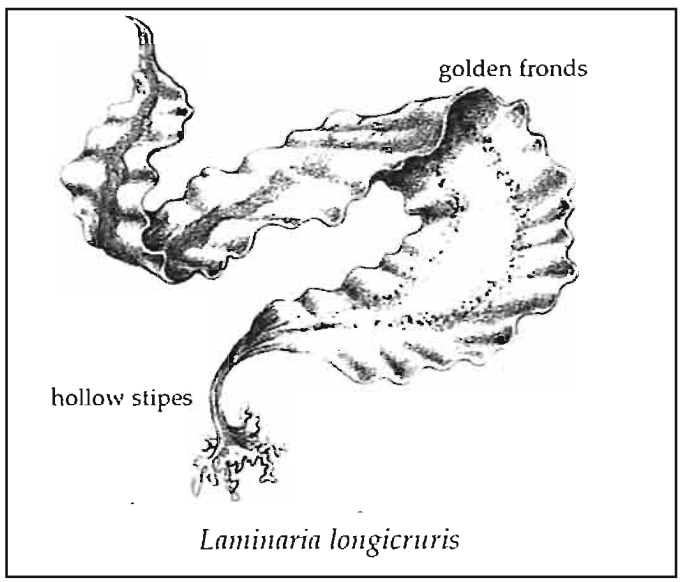
Forty years ago, my wife, Linnette, and I were eating Kombu, a kind of kelp from Japan, when we arrived on Hog Bay in Franklin to find a healthy and simpler life. We soon discovered plants at the Reversing Falls very much like the Kombu, but more delicious and lots cheaper! These golden fronds would appear in early spring though mid summer, right along the Sullivan shore just below the old picnic area. We would wade in, cut a couple of bushel baskets full with our kitchen knife and lug them back to dry, clipped to our clothesline. Soon other seaweed eating friends were asking us for a pound or two and Maine Coast Sea Vegetables made its first dollar that summer of 1971. You can still find abundant kelp growing in this area by the Falls today, as we have been very careful never to take too much. Our harvesters now gather more than 10,000 dry pounds of kelp annually from Taunton Bay to Cutler; never cutting more than a kelp bed can regenerate over the winter.

This season, sustainable harvesting will be an even greater challenge as our sales of kelp have recently quadrupled. The spread of radioactive material from the earthquake disaster in Japan has many people from all over the world looking to seaweed for help. Kelp is loaded with stable iodine 128, a key component for healthy thyroid functioning. If the thyroid doesn't get enough, it will attract radioactive iodine 131, with potentially lethal results. Kelp contains another very helpful compound called sodium alginate. This remarkable molecule has been shown in numerous studies (even by the US EPA) to chelate, or bind, radionuclides (like Strontium 90) and eliminate them from the body.

For these two compelling reasons, a growing number of folks are including kelp in their preventative medicine routine – and many more are eating it just because it makes them feel good and they like the taste. If you pluck a piece out of the water and chew on it, you might not agree. But if you put it in a soup you might like the rich, slightly thick broth it produces. And if you ever cook beans from scratch and throw in a piece of kelp, you'll be surprised how much

Photo by L. Erhart

Shep with a long blade of Laminaria.



Laminaria longicruris

faster they cook, how much better they taste and how digestible they are. This is due to another kelp super ingredient: sodium glutamate, a natural tenderizer and flavor enhancer, close cousin to MSG, without the side effects.

So the next time you cross the bridge that no longer sings or visit the Reversing Falls, perhaps you will take a closer look at those golden fronds floating out there and appreciate them for all they have contributed to the human community over the centuries, and how even today we are turning to them for better health.

Rockweed Perspectives

By Steve Perrin

There is more to rockweed than meets the eye. This is because we regard it, for the sake of clarity, from highly selective perspectives. To see anything at all clearly, we screen out much of everything else that gets in the way of what we're trying to see from our point of view.

Photo by L. Erhart

Phina helps Shep harvest kelp.

"Rockweed Perspectives" is taken from the chapter on interpersonal conflict in Steve's new book, *Know Thyself: Adventures in Getting to Know My Own Mind*, available at Lulu.com. Being the observer he is, in the book Steve turns his attention on the only mind he has ready access to. He starts by citing 18 unforgettable errors he has made over the course of his life, and devotes the rest of the book to examining how he (his mind) came to committing those errors. Each chapter details a stage on what he calls his loop of engagement with the situated reality he experienced at the time. He wrote much of Chapter 10 on personal values during a long wait for new tires to be delivered to Merchant's Automotive in Hancock.

In the case of rockweed harvesting along the Maine coast, the two chief perspectives look at rockweed from opposite sides, from the economic-industrial side, and the research-ecological side. From a management perspective, the challenge is to find a sustainable balance between the two sides.

You can tell immediately which side people are on by the terms they use to discuss rockweed. If you hear "biomass," "wet tons," "weed," "standing crop," or "jobs," you know you are listening to the industrial side of the discussion. On the other hand, words such as "habitat," "primary producer," "refuge," "ecosystem," or Ascophyllum nodosum (the Latin binomial by which the desirable species of rockweed is known), you are hearing the ecological side.

Rockweed harvesters dwell in the space where the two perspectives meet. Their motive for being there is primarily economic—to make a living—but to do so in that particular way they also must develop a professional understanding of what it is they are converting from a nurturing and protective habitat (as seen by one side) to so many wet tons of biomass (as seen by the other). Generally not scientists themselves, harvesters pick up enough ecosystem talk to carry on a conversation with landowners and anyone else who engages them. But they fall short of acquiring an

informed ecological perspective; their allegiance is to the industry, not the ecosystem. By way of compromise, they develop a rationale for taking so much from a given bed of rockweed—often cited as 17% of the "standing crop," deliberately leaving the rest to carry on its ecological function. Their ultimate goal, however, is to deliver so many wet tons of biomass to a dealer at dockside.

The lobster industry in Maine is a notable example of harvesters regulating themselves to assure the sustainability of their fishery. They gave up dragging for lobsters in the 1940s, and now V-notch the tails of egg-bearing females, impose upper and lower size limits on the allowable catch, put escape vents in their parlors for undersize lobsters, limit their strings of traps, set up an apprenticeship system for those wanting to learn the craft, and generally conduct themselves in a responsible and professional manner for the sake of long-term job security. That is, beyond being harvesters, they have trained themselves to be stewards as well. Even to the point of feeding their catch by reliably filling their bait bags, which brings the wild fishery to the verge of being an aquaculture operation.

The question faced by the rockweed industry and ecologists alike include: 1) how much rockweed can be taken without disrupting the long-term structure and productivity of the ecosystems within which it functions?; 2) where can it be so taken?; 3) by what methods?; 4) at what intervals?; and 5) by harvesters with what experience and training? The challenge I see in such questions is that of asking rockweed harvesters to act as good stewards of the resource they depend on for a living. Which comes down to the issue of whose standards are they to meet—those set by the industry, or by impartial ecologists?

Harvest standards set by ecologists consider not only the biomass of the rockweed taken, but the function of that biomass if left in place. As a primary food producer—along with kelp, eelgrass, low marsh grass, and phytoplankton, among others—on which marine ecosystems depend, rockweed supports the survival of the living coast that complements upland forests in giving Maine its character and identity as a human habitat.

How does that work? Rockweed constantly

Photo by Steve Perrin

A Seal pup.

feeds energy derived from photosynthesis into coastal waters from branches breaking off through wear and tear from constant motion imparted by tides and waves. As free-floating wrack, that organic material rides up and down on local currents, providing a surface habitat for amphipods and other life forms, which in turn attracts birds like Bonaparte's gulls and various species of terns—direct beneficiaries of the energy stored in bits and pieces of rockweed. That wrack either exits the bay to feed a variety of species farther along the coast or out in the Gulf of Maine. Or is perhaps deposited at the high-tide line along the shore, where it provides habitat and food for shoreline scavengers—sandpipers, song sparrows, thrushes, gulls, crows, and schools of small fish, among other wildlife species.

Broken into ever-smaller particles, rockweed eventually decays, becomes colonized by protein-rich bacteria, and assumes a new identity as energy-rich detritus, food for filter-feeding mussels, scallops, oysters, barnacles, juvenile lobsters, and early life stages of a great many marine creatures both vertebrate and invertebrate. Detritus is a variant form of the rockweed and other primary food producers from which it derives. In supporting entire marine and estuarine ecosystems, a ton of rockweed in the form of detritus is worth far more than the $40 the rockweed harvester gets paid by the ton. In fact its value is inestimable. What is the going price of a breath of fresh air, a glimpse of sunlight, or a

Photo by Steve Perrin

Seals and a pup on rockweed.

raindrop falling from the sky? Coastal Maine and its gulf run largely on detritus. What is that worth to a fox, eagle, harbor seal, or to you? What is the value of Cobscook Bay, Taunton Bay, or the Gulf of Maine?

The history of Maine fisheries is a tale of descent lower and lower on the food web, until now even primary producers such as rockweed and kelp have a certain market price—not as value-added detritus, but as materials in the raw. Which is the highest and best use of rockweed—detritus to feed the entire coast, or a commodity sold as fertilizer or an additive for commercial foods and cosmetics? Perspectives have implications and ramifications which, like by-catch, often go unrecognized.

To end up, I will shift from the food-web to the habitat aspect of rockweed. Whether providing shelter; opportunity for grazing, foraging, reproducing; refuge from predation; or otherwise essential habitat, rockweed invites life to the intertidal zone, a hardscrabble habitat of extremes if ever there was one. Yet by expanding and collapsing as driven by its highly variable circumstances, rockweed offers its services to all comers with great efficiency, tide after tide, season after season, year after year. Again, what are those services worth to alewives, eels, periwinkles, crabs, copepods, amphipods, crangon shrimp, eiders, black ducks, loons, herons, kingfishers, and the likes whose lives depend on them? What are they worth to you in comparison to having a tub of industrial-grade ice cream in the freezer, or a creamy cosmetic on your lips?

The essential question is: At what harvest level do the ecological and industrial values of rockweed come into conflict so that opting for one penalizes the other? The rockweed industry aims to convert 17% of selected beds of rockweed to biomass. That figure assumes a great deal about the continued functioning of local ecosystems after those beds are cut, their structure radically altered, their biomass removed.

Since the energy stored in rockweed fuels much of the Maine coast, it strikes me that removal of even 17% of select areas is excessive. Given that 100% of rockweed energy turns over every two years, distributing its wealth as wrack and detritus among species such as I have mentioned, a 17% cut on top of 50% annual turnover sounds to me more like a 34% reduction of the "standing crop" on which that natural distribution of food energy depends in the following year. In light of the habitat and energy reductions implied by that level of rockweed harvest, I propose that a 5% cut seems eminently more reasonable,

At the February 10, 2010, Rockweed Research Priorities Symposium at the University of Maine in Orono, Sea Grant joined with the Department of Marine Resources in initiating a process of discovery to find out what gaps still exist in our understanding of the ecological consequences of rockweed harvesting. On February 17, 2010, cur-

Taunton Bay Featured in *Down East Magazine*

The May 2011 issue of Down East Magazine has an informative article by Elizabeth Peavey about horseshoe crabs in Taunton Bay and a spectacular photograph by Chris Becker of one large horseshoe in the moonlight.

The text and a small photo can be found at ***http://www.downeast.com/magazine/2011/may/horseshoes-taunton-bay*** but the full-sized photograph in the magazine is well worth the price.

The Discovery Channel also made some underwater video of horseshoe crabs in Taunton Bay last May and June; but those images have yet to be shown publicly.

rent findings were relayed to the Joint Legislative Committee on Marine Resources, which considers last year's legislation regarding the harvest level in Cobscook Bay a done deal. That is, the state sides with industry recommendations. Which makes it all the more likely that the 17% level of harvest will spread to the rest of the coast.

It is up to resource managers in Maine to decide whether to take a short-term view for the sake of feeding biomass to the industry, or a long-term view including habitat considerations and the gradual distribution of rockweed energy as viewed from an ecological perspective. Stakes are high: Nothing less than the continued productivity and viability of the Maine coast is at issue. I have testified before the Marine Resources Committee that I consider a 17% rockweed cut to be unsustainable. From my perspective, a less risky harvest might be as high as 5% every third year in the same bed if closely monitored.

Taunton Bay Education Center Moving to Gordon's Wharf

By Frank Dorsey

Sullivan voters need to give their final approval at Town Meeting in late June; but, expectations are that Friends of Taunton Bay will move the Taunton Bay Education Center (TBEC) into the town-owned building at Gordon's Wharf on June 1, Friends of Taunton Bay will share space with the Maine Coast Heritage Trust on the main floor of the building. The on-water location will provide better opportunities for the child and youth education programs of the Education Center and a more central and scenic site for the adult-oriented education programs. The basic space will be about the same size as the current facility in Tamarack Place which the Monteux School will use for some of its programs.

The Town of Sullivan has contracted for replacing the deck on the building and refitting the bathroom for handicapped access. Current TBEC exhibits will be relocated during May and June and should be in place for the planned Family days on July 16th and August 6th (in connection with Sullivan Daze). The Taunton Bay Education Center summer camp will be held on August 2 – 4. See the program insert for details of the camp and the Friday lecture series planned for July 8 th – July 29th.

Photo by Beverly Johnston

Campers at Tamarack Place.

Membership and Contributions

By Steve Sjoberg

The financial support that the Friends of Taunton Bay receives from its members and contributors represents the lifeblood of our organization. Your loyalty to our purpose and generosity of spirit make our efforts possible and we thank you!

With this newsletter we are announcing the kickoff to our 2011 – 2012 Membership Campaign. The friends of Taunton Bay membership year begins on August 1st and we hope to increase our member participation substantially in the coming year. We look forward to greeting our new and renewing members at our annual meeting on July 14th and our second members meeting on August 11th. Members will receive an invitation in the mail for both of these meetings.

In addition to welcoming interested supporters of the Friends of Taunton Bay as members, our efforts have also been sustained by independent contributions to FTB's programs and projects. These gifts represent a special interest in specific activities or needs of our organization. Contributors enjoy the knowledge that their investment in FTB can leverage the energy of volunteers and program participants in a very special way.

This year we particularly encourage contribu-

tions to the 2011 Taunton Bay Education Center Summer Child and Family programs. This remarkable series of activities form an environmental education opportunity unique to Taunton Bay. As an illustration, your support can make possible the following:

• The participation of a child in the day camp - $50.00
• Providing refreshments for a day of activity - $30.00
• Providing the education materials for a program segment - $50.00
• Providing a touch tank for the camp program - $75.00
• Supporting the honorarium to the program director - $200.00
• Supporting the participation of guest speakers - $100.00

In the coming year there will also be the opportunity to assist with the purchase of equipment and materials needed to continue the watchful monitoring of the Bay, ongoing scientific study, and collaboration with academic and local institutions to further our mission. We would be glad to discuss these and other efforts needing your support. Again, we thank our community of members and contributors who make the future of FTB an exciting prospect.

Department of Maine Resources Holds Hearing for Mike Briggs New Lease

By Frank Dorsey

On Monday evening, March 28 Diantha Robinson, DMR's Hearing Officer conducted a review of Mike Briggs request for a new ten year lease to grow American oysters (Crassostrea virginica) in upper Taunton Bay. Mike has previously successfully raised oysters from seed size to half-dollar size in floating pens at two other upper Bay locations. Mike had also tried, but unsuccessfully, to raise oysters from half-dollar to market size at two bottom locations in Taunton Bay. One site failed because the bottom mud was too soft and the oysters got covered, losing access to nutrients and oxygen in the water. Another site with firmer bottom had an overwhelming population of starfish which ate the small oysters. The proposed new site has a well-scoured, firm bottom and, at least for the present, few starfish.

Photo by Mike Briggs

Eric holds an eaglet being banded by IFW near the proposed lease site.

Several property owners with waterfronts near or abutting the site raised questions about the impact on "their front yard" of noise, pollution, frequency of use or impact on views. They also expressed concern about potential adverse interactions of the lease activities with horseshoe crabs and their nearby mating sites. Mike or John Lewis of DMR (who showed video of the bottom characteristics of each part of the proposed lease) responded to each issue raised. At the end, one land owner said that if there has to be a lease in that area, "I'd rather have Mike than anybody else."

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