

## **Maine Beaches Conference 2015**

### **Exploring Maine Seaweeds: from Bay to Body 10am-11am**

#### **Southern Maine Community College**

#### **Speakers, Hilary Krapf and Sarah Redmond**

**By Emily Greene**

**Objectives:** Learn about seaweeds, how to harvest seaweeds, how seaweeds are used, differentiate seaweeds from one another, and how to combine wild seaweed harvesting with new technology to culture seaweed in Maine.

Hilary Krapf: I traveled to Ireland after owning my own business in my early twenties. I was surprised at the cultural acceptance of seaweed in Ireland. Seaweed has been used there for ancient medicinal remedies for years. Then I started doing seaweed education with Sarah.

Sarah Redmond: Maine seaweeds; we have a traditional seaweed industry that has been around for a long time. It is a large marine macro-algae. It is an overlooked resource here in Maine. People who live on the coast have always used seaweeds for many different things from farming to aesthetics. One of the reasons why seaweeds are liked is because of their cellular structures to create gel matrixes. That is very important in the food industry. Carrageenan is what is extracted from red seaweeds to produce gels and thickening agents. We work closely with marine policy managers to regulate the harvesting of seaweeds for food additives.

We have this older wisdom from the older wild harvesters mixed with the new idea of aquaculture. We are trying to use that wisdom and new technology to farm seaweed. Our industry in Maine has seen a great spike in demand. Thinking about the western world, there is a remembrance of seaweed that it is a superfood. We are trying to create a sustainable wild harvest fishery for seaweed to meet the demands for seaweed not just around the state but around the world as well.

Many seaweeds are commercially harvested for many uses. The molecular analyses of seaweeds changes all the time, so it can sometimes be difficult to identify seaweeds using keys. There are different species of seaweed that are in different levels of ocean floor.

The Maine 10 seaweeds:

Red, brown and green seaweeds are characterized by their photosynthetic characteristics. Browns are the largest seaweeds in the Atlantic mainly comprised of kelps and rockweeds. Rockweeds are found in the inter-rocky tidal areas. All seaweeds take all their nutrition from the sea water. Hold fasts are what cement seaweed to hard surfaces. Tissue strength is important to keep them from coming detached.

Knotted wrack: Seaweeds are continually generative. The visible berries are reproductive structures. Male and female gametes are released into the water then they settle and attach themselves. Seaweed is very high in trace minerals and bioactive compounds. Plant growth hormones can be extracted to help plant growth which are important for organic farming.

If you harvest seaweed, only harvest the tops of the plant. Take 16 inches from the top and leave the roots. Seaweed aquaculture is made to be very sustainable.

*Fucus* sp. (bladder wrack): Paired air bubbles and since there are many types of *Fucus* seaweeds, they can interbreed sometimes. This seaweed is flat and has a midrib. It also has these very large gel filled sacks where they produce their gametes. Seaweeds are the best iodine sources on the planet.

Audience Question: Are there seaweed harvesting allotments?

Sarah Redmond: Right now, it's open fishery just like every other fishery. The Rockland industry is the first fishery to go through the fishery management. Traditionally, one company harvests in one area, and another harvests in another area so that there is less competition. But, with the increase demand in seaweeds, it's going to be more difficult to create policies for seaweed harvesting. I don't know where that sector of management is going to go. It's usually a public resource, so dividing sections of the ocean and giving it away is illegal. The DMR is playing around a little bit with reporting and management. DMR has resources such as the FMP draft. All the background on the industry, science and etc. about the harvesting to make management decisions. [Seaweedcouncil.org](http://Seaweedcouncil.org) is a resource to utilize.

Now for kelps, there are three kinds that we harvest and use for food. They are large flat seaweeds with a root holdfast. Very strong and flexible stipes. Horse-tail kelp, it starts as one blade, then it splits so it accommodates rough wave action. Very thick and strong. It's great as a whole food and cooking. You can wrap things in the kelp, use it to enhance the soup and stews. The other thing that is interesting is that the quality of food was enhanced by putting seaweed in soups. Studies were done on the flavor of foods and it was found that seaweeds have specific amino acids and led to the mystery flavors of umami. The reproductive tissue is right on the blade and the darker spots are the reproductive areas. They release the spores, they can swim, then they attach to solid surfaces, then germinate. Female gametes release pheromones that tell males to release their sperm.

Audience Question: How long does it take for seaweed to grow?

Sarah Redmond: This is what we do to grow kelp in aquaculture. We collect the spore tissue, then we set up pipes that have lights and aeration. It grows in about 4 weeks and then they can reproduce, as long as the environmental conditions are right. Otherwise, they can become simply vegetative. They can live a couple years, but some are more perennial. They grow very rapidly and there is a lot of turnover.

Audience Question: How do you harvest kelp?

Sarah Redmond: Usually you harvest a percentage of the beds and cut it where the seaweed can reproduce and grow again. They're all a little bit different depending on the seaweed. Just cut the plant and leave the bed and root to regrow when foraging.

We have been growing sugar kelp for six seasons in Maine. They get very large and are very dark. They also have a hold fast, flexible stipe and they can be very smooth and thin or with ruffles. We grow this for food. We grew an interesting form of sugar kelp called skinny kelp. We changed the molecular structure a little, so it's still sugar kelp, just a different molecular

form. We do this to try to figure out all our options for the food industry and materials. The difference is the soaking process and toughness of this new sugar kelp compared to the original.

Wing-kelp. Good for eating and cooking with. Used for seaweed salads.

There's also a diversity in red seaweeds. Lavers in Maine can be purple and red. Very strong, very healthy highest protein source. Also known as nori. Irish moss can be found on lower ledges at low tide. That's a little bit tougher seaweed, but versatile for cooking because it has that carrageenan in it. Very important for healing shingles. Dole, is not as tough as the browns. You can dry it up and eat it. In Canada, they are harvested on giant cliffs, they roll it out and dry it to eat it.

For greens seaweeds, in China there are green tide blooms because of all the nutrients that is let into the water. These seaweeds like warmer waters and China's coastal environment allows them to grow successfully.

The important thing to remember is if the seaweed is attached and living, it is a part of the marine living environment. You have to get a permit to do anything with it. You also have to do something with the seaweed that is washed up on shore. Some people bury it to enhance sand dunes, give it to farmers, or use it for compost.

Audience Question: What happens with climate change and these seaweeds growing?

Sarah Redmond: Currently, we are sustainably harvesting less than 1% of what we COULD be harvesting sustainably. We could be doing it sustainably up to 40%. As far as climate change, seaweeds are sensitive to temperature change. The cooler seaweeds might shift northward while warmer species of seaweed might shift northward as well. Then there's the issue of invasive species of seaweed.