Maine Seaweed

History & Today

Presented by the Maine Seaweed Council

Extraordinary resource
Wild Harvest & Farmed
Harvesting seaweed has been a long tradition in Maine.
Here’s an article from 1907 in the BOSTON HERALD.

Seaweed was being recognized as a valuable fertilizer, feed for livestock & food for the future.

Seaweed “gathering” was hard work!
By the early 1970s, infrastructure was needed to process rockweed
Companies were founded

Shown here standing and to the right- Robert Morse 
Founder of North American Kelp & North Atlantic Labs

More Bounty From The Ocean

Common rockweed fertilizes soil, nurtures fruit and is good for what ails cattle. Or so it's claimed. And we may soon be eating it ourselves, if an ambitious young Maine aquaculturist has his way.

By Anne Weber
Photography by Norm Gibbons

ROCKWEED, that plentiful seaweed commercially used for shore bait and labor-saving, may be coming into its own again as a fertilizer, cattle feed, and even as an element in human diet. At least this is the hope of a youthful Rockland entrepreneur who has established the industry of processing seaweed in Maine.

The virtue of seaweed has long been known to agriculturists. In very ancient times it fertilized the fields of Oriental farmers, the Roman; used to feed animals and to grow vegetables. As early as the 13th century its use in medicine was referred to in the literature of Norway, England, and France. Even now in the lore of botany and botanists, where seaweed continues to enrich our fields, one can hear the bowery old expression, "point de voir, point de languir." (no seaweed, no corn).

In America, the first factory to process seaweed for agricultural use opened in Rockland in 1976, and its products were sold relatively "in the murky fields of ignorance and Some," according to the late-80s Robert Morse, head of Atlantic Laboratories, that manufactures a seaweed feed (Sea Lib), and a seaweed extract (Sea Crop), the latter sold as a fertilizer.

Rockland entrepreneur Robert Morse, former the ship whose harvests are not to be missed for food, although we have currently to do with poor to understand why. Morse and employees, were found to be in a heavily saturated hour for the cost of seaweed.
Susan Domizi-Founder & CEO
SOURCE micronutrients
The seaweed industry wasn’t just about “Rockweed”!

Shep Erhart (Founder of Maine Coast Sea Vegetables) harvesting wild sugar kelp with baby Seraphina—*circa* 1975
These 1970’s companies paved the way for today’s seaweed markets and good Maine jobs.
A SEAWEED HARVESTER’S WORK DAY IS SET BY THE TIDES
NOT A CLOCK!
HEADING HOME LATE
Sharing the day with our wildlife companions
... and curious friends...
H-2 and the Cormorant
08/19/2019
There are many types of seaweed in Maine.

Shown here is *Ulva* often called Sea Lettuce & *Palmaria* often called Dulse.
They come in a variety of colors and shapes

- Above photo of Laver or Nori
- Below photo of Chondrus or Irish Moss
There are several varieties of kelp. Sugar kelp, Skinny kelp, Horsetail kelp and Winged kelp to name a few...
There are too many types of Fucus to mention by name!
And the most abundant along Maine’s coast is Ascophyllum nodosum (aka Rockweed)!
What is Rockweed?

• “ROCKWEED (Ascophyllum nodosum) is one of a number of canopy-forming rockweeds (=fucoid algae) that are present and abundant on the Maine Coast.” —Jessie Muhlin PhD
Rockweeds are brown algae. Contrary to popular belief they are not plants. They are marine organisms.
Some seaweed can be farmed.

- Mariculture is a specialized branch of aquaculture involving the cultivation of marine organisms for food and other products.
Kelp is the most commonly farmed seaweed in Maine.

Shown here, Linnette Erhart drying wild Saccharina in 1975 with some help from daughter Seraphina.
Aquaculture begins at the Lab

This is ripe Sugar Kelp sorus being prepped for release and in a beaker.
Once the sporophytes have attached to the spool it’s time to SEED THE FARM.
Kelp grows rapidly over the cold Winter months.
These 2 week old sporophytes will mature by Spring!
Other seaweed like Rockweed is primarily wild harvest.
Farmed or wild, there are many uses for seaweed.

As a World Food Supply
Nutritional Supplements
Bio-stimulants
Fertilizers
Pharmaceuticals
Nutraceuticals
Cosmetics
Skin care
& Art
Here are some locally grown potatoes using **SEAWEED BIOSTIMULANTS**
Seaweed extract increased the yield by 3000 potatoes per acre with no additional fertilizer or pesticides.
A natural product from the sea...
More potatoes.
Seaweed also provides essential micronutrients for people & animals.
These horses enjoy their seaweed
ORGANIC KELP MEAL for animals

1/2 oz. = 1 Rounded Tablespoon

Dairy Cows 2 oz./day  Horses 1/2 oz./day
Beef Cattle 2 oz./day  Goats 1 oz./day
Calves 1 oz./day  Sheep 1 oz./day
Swine 1 to 2 oz./day  Chickens 1% of total feed

GUARANTEED ANALYSIS
Crude Protein, not less than . . . . . 5%
Crude Fat, not less than . . . . . 1%
Crude Fiber, not more than . . . . . 0%
Salt (NaCl), not more than . . . . . 0%
Potassium (K), not less than . . . . 2%

And word in the barn is getting around!
Seaweed nourishes Champions
And our BEST FRIENDS!

‘Mandy’ as a puppy and as a 12 year old Great-Grandmother!
Seaweed comes in a variety of consumer friendly options:

- Whole dried
- Sprinkles
- Flakes
- Powder &
- Puree

*just to name a few*
Maine Coast Sea Vegetables®

It makes for Great snacks and seasonings!

Maine Coast Sea Vegetables®
Everyone benefits from good nutrition
Plants, Pets & People
Seaweed is often used in High Quality Natural Skin Care

Maine companies are committed to formulating and producing products that are safe, healthy and made with no harmful chemical additives.
MAINE SEAWEED PRODUCT
Seaweed can be the subject of beautiful ART!

“Time Lines 01”

Archival pigment print by Celeste Roberge.
“Meeting While Walking Under the Sea”

Collage with seaweeds and textiles by Celeste Roberge.
Seaweed Boat. Archival pigment print by Celeste Roberge
Desmarestia aculeata
Cyanotype by Celeste Roberge
Here are some of Maine’s Seaweed Companies...
These 4 seaweed companies were started in the 1970’s and are still in business today, harvesting in the same bays.
By rotating the seaweed beds, a small geographic location can regenerate rockweed year after year.
There are several methods of harvesting seaweed depending on the species...

HAND GATHERING

RAKING

USING A KNIFE

MECHANICAL
Regardless of method, care should be taken.

When hand harvesting it’s important not to cut too much or pull off the holdfast.
A mechanical harvester must be properly designed.

This one is NOT!

Anyone know why?
Correctly designed mechanical harvesters

- Superior design because of a horizontal v. downward cutting head.
- Designed to cut at a certain height to protect the resource.
- Prevents over harvesting.
- Virtually eliminates “by-catch” through sound and vibration.
- Eliminates hold-fast removal.
- Improved designs reduce noise and run more efficiently.
All cut seaweed is captured into a net on the back.
Mother Nature harvests too!

- Storm cast can produce rolls of rockweed along Maine’s shores.
Seaweed can be trapped in ice and pulled out.

- Reference Vadas paper & DMR

• We are witness to the resiliency of rockweed to continue regenerating year after year.

• Even the huge biomass that Mother Nature removes and the much smaller amounts removed by commercial harvesting still leaves enough to release new spores which attach to those same ledges and continue to reproduce.
SO LET’S TALK SCIENCE!

SCIENCE & INDUSTRY

The essential partnership for the future of the resource
Seaweed attaches itself by a holdfast.

This is not a root because it takes in no nutrients.

Nutrients come from the surrounding ocean.

• By leaving the hold fast and a current cutting height of 16”, rockweed can regenerate year after year.

• All other fisheries take the entire organism.

• Seaweed harvesters leave the original organism to reproduce.
Ground-Truthing the cutting height!

Susan Domizi-Founder of SOURCE
The holdfast of Ascophyllum typically supports numerous short fronds (suppressed by light limitation) in addition to the tall fronds. When the taller fronds are broken or removed, regeneration of the canopy usually occurs by growth of these basal shoots and formation of new, lateral branches from the cut fronds.

Did you know this is a male?

Greenish yellow; when mature, **male** receptacles have lots of little **orange dots**.

Darker Green; when mature, **female** receptacles have **green dots**.

- The reproductive receptacles contain sperm (in males) and eggs (in females). Spring water temperature corresponds with the beginning, peak, and end of when eggs and sperm are released into the water for external reproduction.
Here’s a good example...

BABY ASCO!

This photo was taken at a boat ramp on the tar at low water. It shows that seaweed will attach wherever it can and grow even in extreme conditions.
Good Harvest practices lead to New growth and lush habitat
Like counting rings on a tree trunk to estimate the age of the tree, the distance between air bladders on rockweed indicates how much it grows each year. In some cases 8-9”!
Research has been going on for decades
In a letter written by Commissioner Keliher...

October 17, 2019

“...Maine’s [seaweed] fishery has been ongoing since the 1970’s and the Department [of Marine Resources] is not aware of any scientific research that has documented a deleterious or irreversible impact on Maine’s marine ecosystem from rockweed harvesting.”
Abstract...

“Sediments and smaller invertebrates were mostly unaffected by canopy removal in both the experimentally and commercially harvested sites.”
Turnover rates of *Ascophyllum* ranged from 29 to 71% (mean over all sites = 54%) indicating that the biomass of this alga turns over approximately every two years.
Objective: Assess animal and abiotic responses to rockweed harvest.

Using a Before-After Control-Impact (BACI) Study Design
Elliot Johnston, researcher seen here with Greg Tobey from SOURCE harvesting one of the CRASSH test sites. July 2019
Hannah Webber from the Schoodic Institute & member of the CRASSH Team doing research on invertebrates living within the seaweed beds.

Selected sites included those harvested last year, 2 years ago, 4 years ago and never harvested.
Dr. Jessica Muhlin (left) & Citizen Scientists setting up research quadrants
Bigelow Laboratory scientists are collaborating with other organizations in identifying seaweeds for dietary supplements that could reduce methane emission by cattle.
In 1993 the Maine Seaweed Council was formed in an effort to seek regulation & protect the resource.

Membership includes renowned scientists, educators, artists, environmentalists, business owners, harvesters & involved citizens.
Maine has some of the most beautiful & nutritious seaweeds.

- The Maine Seaweed Council strives to protect the ecosystems of Maine’s marine algae, develop and adhere to sustainable cultivation and harvest practices, promote the use of Maine seaweeds, educate the public, regulators, and elected officials and provide a collaborative forum for its members.
In an almost unprecedented move, the Seaweed Industry initiated strict harvesting guidelines to self regulate and ensure sustainable practices.

“No one cares more about the resource than those who rely on it to make their living.”  A seaweed harvester
It’s a partnership!
Seaweed Harvesters must be licensed. Harvesters must record & report each days catch.

Rockweed harvesting requires:
- Minimum cutting height of 16”.
- Must leave Lateral branching.

A Seaweed Fisheries Advisory Council to the DMR was implemented in 2019.

THE DEPARTMENT OF MARINE RESOURCES REGULATES SEAWEED HARVESTING.
Members of Industry, Science, Conservation & the Department of Marine Resources collaborated to create the FISHERIES MANAGEMENT PLAN FOR ROCKWEED.

Unfortunately while this extensive plan has not yet been implemented due to the court ruling in Ross v. Acadian Seaplants, LLC. on 3/28/2019, The MSC is committed to upholding the guidelines set forth in this document.

So what does the future hold?

The Maine Seaweed Council & The Seaweed Fisheries Adv. Council along with researchers, regulators, industry members and caring citizens will continue to support the mission of good harvesting practices for this important fishery.

We hope you will support our efforts.
THANK YOU for letting us share this information.
FOR MORE INFORMATION, VISIT US ONLINE AT seaweedcouncil.org