Frenchman Bay Partners Rockweed Meeting Minutes

April 2, 2016 9-12 pm

Sullivan/Sorrento Recreation Center

1776 US-1, Sullivan, Maine

Attendees

Duncan	Bailey	MDI Biological Laboratory
Rick	Bard	Downeast Coastal Conservancy
Amy	Baron	University of Maine
Roger	Bowen	Gouldsboro
Julie	Bowser	COA
Savannah	Bryant	COA
Melisa	Chan	COA
Katie	Clark	COA
Stephanie	Clement	Friends of Acadia
Ali	Clift	MCC/Hancock County Soil and Water Conservation District
Nicholas	Conti	COA
Mickey	Cornish	COA
Nina	Crocker	Maine Seaweed
Jock	Crothers	Sorrento
Dennis	Damon	Penobscot East Resource Center
Bob	DeForrest	Maine Coast Heritage Trust
Andrea	DeFrancesco	Harvester
Fiona	DeKoning	Acadia Aqua Farms
Al	Dinsmore	Trenton/Franklin
Linda	Dinsmore	Trenton/Franklin
Jane	Disney	MDI Biological Laboratory
Frank	Doresy	Friends of Taunton Bay
Laura	Dzurec	Friends of Taunton Bay
David	Dzurec	Friends of Taunton Bay
Anna	Farrell	MDI Biological Laboratory
Jenn	Fortier	City of Ellsworth
Emma	Fox	University of Maine
Alan	Gray	Friends of Taunton Bay
Robin	Hadlock Seeley	Shoals Marine Laboratory
Susan	Hand Shetterly	
Larch	Hanson	Maine Seaweed
Leslie	Harlow	
Lisa	Herrington	Friends of Taunton Bay
Lindsey	Jones	COA
Meret	Jucker	COA
Julie	Keene	Fisherman

Maddie	Kellet	COA
Elsa	Kern-Lovick	COA
Emma	Kimball	COA
Amanda	Klemmer	University of Maine
Carol	Korty	Lamoine Conservation Commission
Anne	LaBossiere	Lamoine Conservation Commission
Larry	Libby	Lamoine Conservation Commission
Bob	Morse	North American Kelp
Madeline	Motely	COA
Jessica	Muhlin	Maine Maritime Academy
Diane	Nicholls	Lamoine
Brian	Olsen	University of Maine
C.J.	Pellegrini	COA
Chris	Petersen	COA
Sarah	Redmond	Maine Sea Grant
Jeff	Romano	Maine Coast Heritage Trust
Carl	Ross	Shorefront owner
Molly	Samuels	COA
George	Seaver	Ocean Organics
Roberta	Sharp	Friends of Taunton Bay
Steve	Sjobeg	Friends of Taunton Bay
Margaret	Snell	
Natalie	Springuel	Maine Sea Grant
Medea	Steinman	Friends of Taunton Bay
Terry	Towne	Maine Coast Heritage Trust
Lindsay	Tudor	MDIFW
Raul	Ugarte	Acadian Seaplants Ltd.
Tom	Walsh	Journalist
Nat	Warren-White	
Jacqueline	Weaver	Ellsworth American
Hannah	Webber	Schoodic Institute
Teagan	White	COA
Mark	Whiting	Hancock County Soil and Water Conservation District
Nathanial		Harvester

9:00 Welcome and Introduction

Jane Disney, President of the Frenchman Bay Partners, began the meeting with a general introduction to the Frenchman Bay Partners, reading the mission, which “is to ensure that the Frenchman Bay area is ecologically, economically, and socially healthy and resilient in the face of future challenges” and vision, which “is a healthy and sustainable future for Frenchman Bay where multiple users can enjoy the inherent beauty and benefit from the ecological and economic viability of the bay”. Jane explained that

the Partners decided to host a meeting to learn more about rockweed from a variety of perspectives: biology, economics, and legal issues. The Partners are considering adopting rockweed as part of the Frenchman Bay Plan, a conservation plan with four conservation targets: eelgrass, mudflats, benthic habitats, and diadromous fish.

Anna Farrell briefly went over the pie charts showing how people rated their knowledge about rockweed biology, economics, and legal issue before the meeting (Appendix 1, Figure 1).

Natalie Springuel acted as facilitator for the meeting, and began with introductions around the room. Everyone stood, introduced themselves, and, if they wished to, shared their affiliation and where they live. She went on to describe how this is an incredible opportunity to learn from each other and stated that the goal of the meeting was an exchange of information, rather than an occasion to make any decisions. With a room full of differing opinions, she asked everyone attending to follow seven ground rules:

1. Listen hard.
2. Share the airtime, one person at a time.
3. Share information, experience, and feelings.
4. Look beyond positions to possible shared interests.
5. Propose solutions.
6. Explain why, ask why.
7. Attend to time and topic.

Natalie closed her welcome with an invitation for everyone to ask questions throughout the meeting by writing questions on notecards scattered on tables around the room.

9:20 Presentation – Biology, Robin Hadlock Seeley

Robin Hadlock Seeley, Ph.D., presented on the harvest sustainability of rockweed. Robin is affiliated with Cornell University and Shoals Marine Laboratory. She began by talking about rockweed habitat, of which there are three main types:

1) Rockweed forests in the intertidal, where plants are attached to rocks.
2) Floating rafts at sea
3) Unattached rockweed as part of the wrack line, which an important habitat for shorebirds.

Rockweed provides habitat for a wide variety of species. This rockweed community includes 74 invertebrate species; 35 fish species, including many that are commercially fished; and >135 bird species, many of which are of interest to conservationists.

Rockweed harvesting negatively impacts the community in a variety of ways, including: reducing biodiversity, reducing species richness, removing snail prey, decreasing the abundance of common eider chicks, decreasing the abundance of amphipods and isopods, and reducing detritus input into the ecosystem, which affects nutrient recycling.

Then, there are harvesting impacts on rockweed itself. Rockweed regrows after harvest, but do beds return to their pre-harvest biomass? Are new holdfasts established? Density, biomass, clump biomass, and average length are all affected by harvesting. Seeley cited a rockweed area in Edmunds, Maine that was machine harvested in 2012. Two years later, the habitat had shifted from *Ascophyllum* to *Fucus*. She also showed videos of Cobscook Bay displaying the effect of machine harvesting on beds in that area. Stature or height regrowth was 1.5"/year. However, there is not a standard regrowth rate for all areas. In Nova Scotia, for example, regrowth was measured at 10"/year. In some areas, the plants regrow laterally, but not vertically, becoming bushier rather than taller. Because there is such wide range and variation in regrowth, it would be difficult to apply one management regime to every area.

When discussing rockweed harvesting sustainability, there are two types of sustainability to think about: biomass and ecological. Biomass sustainability is characterized by maximum sustainable yield, industry focused, and concentrated on a single species. Ecological sustainability considers both ecosystem and habitat impacts, and includes other species. Seeley put forth the argument that industry is focusing on biomass sustainability, but we need to focus on ecological sustainability, because the evidence shows that rockweed harvesting is not ecologically sustainable.

9:35 Presentation – Legal/Policy, Jeff Romano

Jeff Romano, Maine Coast Heritage Trust, presented on legal and regulatory issues relating to rockweed. At this time, the biggest legal issue regards ownership of rockweed and the intertidal. Jeff outlined historical and present laws and regulations, and shared the recommendations of the Department of Marine Resources (DMR) Fisheries Management Plan.

A current Washington County lawsuit involves three landowners who filed a complaint against Acadian Seaplants Ltd in 2015. The question is, "Who owns the rockweed and the intertidal?". The outcome of this case, which is moving to the Maine Supreme Court, may determine if rockweed is a fishery or not.

The Colonial Ordinance of 1641/1647, which was incorporated into Maine Common Law in 1820, grants upland landowners the intertidal (down to the low water mark) "in fee", but the public retains the right to any activities falling under the "fishing, fowling, and navigation" easement. The key question here becomes, "Is rockweed harvesting considered fishing?". The rulings of the Maine Supreme Court have been inconsistent in answering this question. In *Moore v. Griffen* (1843), the courts ruled that the public has no right to harvest rockweed, stating, "no such right of taking sand, sea manure, or ballast in the grant made to the owner of the adjoining land". In *Hill v. Lord* (1861) the courts decided seaweed belongs to the owner of the soil upon which it grows or is deposited. In *Marshall v. Walker* (1900), seaweed was ruled as part of the public trust: the public may take sea manure from privately owned flats. According to the rockweed industry, rockweed harvesting is fishing. They support their position with the following statute citations:

- Sovereignty, MRSA Title 1
- Definition of the verb "to fish", MRSA Title 12
- Definition of "fishing" according to the Internal Revenue Service

The Common Law interprets the intertidal as "non-alluvial" up to the high water line. Alluvial seaweeds are those of the land, and belong to the landowner. Non-alluvial seaweeds are those of the sea, and belong to the public trust. Therefore, the public retains the right to harvest non-alluvial seaweed, but once it is cast above the high water line, it becomes private property of the landowner. Thus, the fishing, fowling, and navigation easement is liberally interpreted.

Maine Coast Heritage Trust as an organization thinks the statutory citations are irrelevant, and has taken the position that the intertidal is non-alluvial up to the low water mark. Therefore, rockweed growing in the intertidal belongs to the upland landowner. Set in historical context, "it is clear" in *Hill v. Lord* (1861) that 19th century citizens did not view seaweed harvesting as fishing.

Romano went on to speculate how the court will respond to the current case regarding ownership of the intertidal. In *Bell v Town of Wells* (1989), the majority opinion limited the public trust easement for recreation. The dissenting opinion, filed by Judge Wathan, stated "similarly, we have prohibited the taking of seaweed from the flats of another". In *Eaton v Town of Wells* (2000), a broader definition of "fishing, fowling, and navigation" is used. Current Maine Supreme Court Chief Justice Saufley concurred with this broader definition. In *McGarvey v. Whittredge* (2012), three justices generously interpreted the definition of fishing, fowling, and navigation. There is legal precedent for a narrower definition of the fishing, fowling, and navigation easement; however, there is also some evidence that the Maine Supreme Court would like to consider a more liberal definition.

Existing law mandates a 16" cutting height (above the holdfast), and requires a license for harvesters and buyers. That is the extent of statewide regulation. Cobscook Bay has a sector management plan, setting maximum biomass removal at 17% and completely closing conservation areas. It also requires DMR-approved annual harvest plans, specific to Cobscook Bay. However, the DMR is not doing anything until the lawsuit is settled. Similarly, the DMR Fisheries Management Plan 2014 is pending resolution of the lawsuit. It makes six recommendations:

1) Maintaining the 16" cutting height
2) Coast-wide sector management to be implemented by major substantive rules.
3) Designation of "No Harvest" areas – there is a working group focused on priority bird species.
4) Status quo on Cobscook (for now).
5) Mandatory harvester training program.
6) Five-year review by the DMR.

9:50 Presentation – Biology/Harvest Management, Raul Ugarte

Raul Ugarte, Acadian Seaplants Ltd., presented on the management of *Ascophyllum nodosum* by Acadian Seaplants. The company, based in Canada, harvests from Cape Breton to the edge of Nova Scotia. Most of their harvesting takes place in New Brunswick.

Rockweed is the most dominant seaweed in the rocky intertidal. It does not grow as fast as kelp, but it is a highly resilient seaweed, living in an environment that can range from -30°C to 30°C. Every spring, plants form new vesicles; this is how you can age individual plants. Several individuals make up a clump. The holdfast is essential to the survival of shoots, and population is dependent on vegetative growth.

Some winters mean a lot of ice damage for rockweed areas. Ugarte showed an image of a location in 2003 with lots of ice damage, then two and four years later. The bed totally recovered. He also showed two images from 2015, one from March and one from September, pointing out the regrowth within a few months. Through evolution, the plant has developed compounds called biostimulants that keep it hardy and safe from predators. These compounds are useful in growing agricultural crops.

The 1995 Canadian Ocean Act takes an ecosystem approach to managing *Ascophyllum*, a $50 million USD industry in Canada. Area-based management divides harvesting leases into smaller sectors, which eliminate concentrated harvesting. There are 340 such sectors in Nova Scotia and New Brunswick; different sectors have different rates of harvest, and some areas are restricted. A portion of the annual biomass is taken each year. Harvesters use a boat and a specially designed cutting rake, and mechanical harvesting is not allowed in New Brunswick.

The company has conducted 20 years of continuous research, and from that has concluded that 42% of the seaweed you see in September is new growth. Their stock assessment program uses satellite imagery to determine area measurements. The program can differentiate between *Ascophyllum* and *Fucus*, but they also go into the field and ground truth the satellite data to determine the resource availability. All this information is put into a GIS program and used to draw sectors. Harvesters are assigned to specific sectors with specific quotas. Unloading sites keep track of and measure the weight of the harvest. Under the precautionary approach, landings have reached 40,000 metric tons, which is about 10% of the total biomass available. The standing stock is estimated at 436,000 metric tons.

The company is working with Dr. Brian Beal at the University of Maine to determine the impact of rockweed harvesting on invertebrates. They have not found any evidence that there is a difference between harvested areas and control areas. Research by Lou Van Guelpen at the Huntsman Institute has shown no evidence of harvest impact on fish larvae or adults. After 22 years of harvesting, Acadian Seaplants finds that there has been no change in the length or diameter of the rockweed, indicating that the structure of the beds is not changing. Similarly, the Irish have been harvesting seaweed off the coast for more than 200 years, and the structure is still there.

10:05 Presentation – Biology, Jessie Muhlin

Jessie Muhlin, Ph.D., Maine Maritime Academy, presented on the reproductive ecology and food web dynamics of rockweed. Rockweed, a fucoid algae, is a lithophytic (rock loving), intertidal seaweed. There are two dominant species: *Fucus vesiculosis* (commonly called bladder wrack, lady wrack, and rockweed) and *Ascophyllum nodosum* (commonly called rockweed, Norwegian kelp, and knotted wrack). *Fucus* outcompetes *Ascophyllum* in environments with high wave energy, which *Ascophyllum* dominates in calmer, more sheltered environments. *Ascophyllum*is the commercially harvested fucoid in Maine. It has a long legacy of harvesting and a lot of different applications. Both algaes are perennial, foundational species. As long as the holdfast remains, they can grow back. Wounds will grow new shoots. They are primary producers and provide important habitat and substrate for things to grow on. Rockweeds can modify the chemistry of the local area. There is a lot of variability in rockweed bed characteristics between geographic locations because of variation in the chemistry, biology, and physics of an area. This

means growth rates and population structures differ between regions. It's important to remember that the natural world is not static! Rather, it's continually changing.

Reproduction is influenced by chemical and physical factors. Rockweed reproduces externally, and plants can be male, female, or hermaphroditic. Reproductive vs. vegetative allocation varies spatially and temporally, but much of the biomass is dedicated to reproduction. There can be up to a thousand reproductive receptacles per male plant. Day length and water temperature determine maturation and gamete release. Gamete release typically takes place from mid-late April to mid-late June, and by June, the receptacles detach and rot, resulting in detritus for the environment. There is a window for reproduction to occur: 6°C onset, 10°C midpoint, and 15°C termination. Therefore, changes in temperature may influence the reproductive timing of *Ascophyllum*. This is particularly important to note in the Gulf of Maine, where water temperatures are rising.

Jessie then provided her perspective on harvesting. The harvesting practices that take place do not remove the whole organism. Since reproduction can take place across the whole plant, harvesting will not keep an individual from reproducing, which also means it won't remove genetic diversity. Harvesting can modify, but does not eliminate foundational characteristics. Resilience and wound repair contribute to their longevity over time. However, there is a lot of research to continue, and new research to initiate, including citizen science opportunities. Jessie concluded her talk by comparing careful rockweed harvesting to another Maine industry: balsam fir tipping.

10:20 Coffee Break

10:40 Panel Session

A panel made up of Robin Hadlock Seeley, Jeff Romano, Raul Ugarte, Jessica Muhlin, George Seaver, and Bob Morse responded to written participant questions, comments, and concerns.

Bob Morse and George Seaver introduced themselves. Bob Morse owns North American Kelp, based in Waldoboro, and has 44 years of sustainable harvesting experience beginning in 1972. His company produces animal feed supplements and liquid fertilizer products. George Seaver owns Ocean Organics Corporation, which he started in 1991. His harvesters harvest the same areas year after year, and his company produces seaweed extracts for fertilizing agricultural fields and for various golf course products.

Attendee questions were categorized into three topics: ecology and habitat, law/DMR management/regulatory, and industry.

1) **Has there been any research conducted in Frenchman Bay related to *Ascophyllum*?**

   Raul said not in Frenchman Bay specifically, but there has been research conducted in Cobscook Bay. Each area is unique. Jessie mentioned that researchers at UMaine have taken students out to survey biomass and population structure in Lamoine, but the data is unpublished. She offered to help find that research.

2) Clarification of alluvial vs. non-alluvial

Jeff began by redefining alluvial and non-alluvial. Alluvial means attached to the land, though it can still be in the water. Non-alluvial is not attached to the land and lies in the public domain. From an industry perspective, the line between alluvial and non-alluvial is drawn at the normal high water mark. In Maine, the upland owner's title designates their ownership to the low water mark. This is where the contention lies: if industry considers the intertidal to be public domain up to the high water mark, but landowners own the intertidal to the low water mark, then who has the right to harvest rockweed in the intertidal? The ensuing debate among the panel members focused on ownership of the intertidal. George brought up the ruling of *Hill v. Lord*, which defined alluvial seaweed as seaweed that has been washed up onto the shore, at which point it becomes the property of the owner of the flat. Bob talked about how the Colonial Ordinance was changed in 1647, giving the upland landowner the right to build a pier and own it into the intertidal. Furthermore, a case in the 1860s ruled that the land line is at the water, and the landowner is not taxed in the low tide area. However, this has been construed as ownership of resources in the intertidal, which is detrimental to anyone wanting to do anything in the intertidal, and if landowners want to claim ownership of the seaweed, then what's to stop them from claiming ownership of clams? Robin countered Bob's comments by saying this is strictly a case about seaweed, because clams are part of an established law that places them in the public trust. Just as a landowner owns the entirety of a tree on their land, so to do they own the entirety of the seaweed, which is rooted in the rocks on their land. George then brought up what makes something a fishery, and defined it as something that relies exclusively on the ocean for nutrients. He concluded that because rockweed gets its nutrients from the water and not through the holdfast, it's a fishery.

3) What is the scope of the rockweed industry in Maine, historically and today?

This question wasn't answered clearly, but George began with his company, Ocean Organics, which employs 14-20 people, and uses a pickup truck to harvest. He knows of only two other companies. Raul said the *Ascophyllum* industry is growing because rockweed products provide an alternative to things like chemical fertilizers, among other things, and it will likely continue to grow. He estimates that Maine has double the stock of Canada, but guesses the industry would never harvest more than 5% of that. Bob agreed with Raul about the 5% maximum harvest. Regardless, total harvesting in Maine has tripled in the last 20 years and seaweed harvesting in Maine is a $20 million industry. Seaweed harvests around the world add up to 250 million MT. In addition to being directly consumed, seaweed is used in a variety of ways. There are two main types of harvesting: mechanically and by hand. North American Kelp harvests mechanically, Ocean Organics uses knives, and Acadian Seaplants uses a specially designed rake.

4) Regrowth rates: Why is the rate of regrowth in Maine so much slower than Nova Scotia?

Raul, Jessie, and Robin all agreed that regrowth is highly variable and depends on the area. Jessie explained that variability has to do with light, adequate nutrition, water motion, water

chemistry, etc. The coast is not a uniform environment. Robin added that there are different aspects of growth to consider: biomass and length. Raul said biomass and length are correlated.

5) **What is the State of Maine doing to manage rockweed? What is the licensing process?**

According to Bob, the Maine Seaweed Council was set up in 1995 in anticipation of seaweed management. 15 seaweeds are harvested commercially on the coast of Maine. The Department of Marine Resources (DMR) is charged with developing, regulating, and promoting a resource, but it's difficult them to do all three. As a results, seaweed is fairly self-managed. Processers and harvesters have no reason to harvest more than they need, and the two groups have been working very closely for the past 15 years in a sector management scheme. To harvest seaweed, you need a license, but there was disagreement between Bob and George over whether there are seaweed-specific licenses (i.e. a license just for harvesting rockweed). A tonnage tax on seaweed goes towards a dedicated research fund. George said the danger the coast of Maine faces is not from small-scale harvesters. The fear is that large-scale companies will come in and decimate the resource through poor-harvesting methods and overharvesting. The Fisheries Management Plan was put in place to prevent incoming offshore companies. A few audience members, both of them fishermen, piped up. One said if fisheries were regulated well, then we wouldn't have depleted fisheries, such as cod. We need to regulate to prevent big companies from coming in and to promote good management. The other said there are very few wardens in the state to enforce regulations, and rockweed tends to fall by the wayside. For example, the DMR was called in to address a violation of the 16" rule (harvesters cannot cut the plant shorter than 16"). The violation was dropped on the grounds that the area of low-cut harvest was not large enough. In contrast, if you catch just one lobster that is below the minimum size requirement, that's a violation. Why is the tolerance so low for lobster, but so high for rockweed? In addition to regulation, we need increased capacity for enforcing it.

6) **What role, if any, does *Ascophyllum* play in nutrient cycling in coastal waters, and how do these nutrients impact rockweed growth?**

Jessie explained how *Asophyllum* is a primary producer, meaning that it takes up carbon dioxide, and is a player in reducing ocean acidification. It also takes pollutants out of the water. When rockweed sheds its receptacles and epidermal layer, nitrogen, phosphorus, and trace minerals are added to the detritus, which is important to filter feeders, but this is altered with harvesting, added Robin. George said that proper harvesting promotes growth, and reiterated the link between rockweed and mitigating ocean acidification.

7) **Does the 2007 legislation protecting shorebird habitat play a role? What's the impact on eiders?**

The Natural Resources Protection Act exempts all fisheries, including rockweed. Studies on the relationship between harvesting and the common eider haven't taken place yet, but is upcoming at the University of Maine. Jessie said there are indirect links to bird populations (i.e. stable isotopes and trophic dynamics). Studies are being designed right now at the University of

Maine to obtain some hard numbers. Robin mentioned a study that found selected impacts of rockweed harvesting on chicks. George said that there's no question that harvesting is disruptive at sensitive bird sites. The real question is what defines disruption, and how frequent is it? He said his harvesters are not going to the same site every year, and only spend a few days at each site, so disruption is likely low. Have we ever taken away enough rockweed to impact feeding? Raul said it's very important that we get the scientific data. Lindsey Tudor, Maine Department of Inland Fisheries and Wildlife added that the impacts at various times of year varies a lot depending on the nesting, habitat, and migration patterns of a species. Bob opined that rockweed in the high intertidal area is rarely high enough to be cut, therefore it can be considered an area of permanent conservation.

8) **What's the difference between mechanical and rake harvesting?**

Maine allows both mechanical and rake harvesting. Bob explained how mechanical harvesting uses pressure to suck the plant into the machine, where a rotating blade snips the tip off the blade off. The holdfasts are left untouched. Raul shared how rakes are more efficient for Acadian Seaplants, but he thinks both mechanical and rake harvesting are effective and have the same minimal impact on the environment, as it is difficult to cut too much. Robin responded by saying the theory of the machines makes sense, but Cobscook Bay shows that in practice, a lot of damage can be done quickly.

9) **What is needed to build consensus around rockweed harvesting, particularly in Frenchman Bay? What are some research priorities? Where can we find common ground?**

Raul: We need a forum where we can present all the different factual information, not opinions. We can put everything we know on the table, analyze it, look for gaps, and go from there.
George: We need to figure out how to arrive at legitimate conclusions. When you're harvesting at the rates industry harvests at, it's very difficult to draw conclusions because the numbers are so small. Industry has 40 years of empirical data, as well as historical records of when and where rockweed grows/is harvested that it is willing to share.
Jessie: There's already a lot of data out there; collected together, perhaps we can start to fill in the gaps. There's also a human dimension to harvesting that needs to be incorporated into the research.
Robin: The problem is political, and the solution isn't in more research. Papers can be manipulated by different sides to support their perspectives. Rather, we need to figure out how to reach consensus. One starting point is an agreement between conservationists and industry that coastal conservation areas are off limits to harvesting. There aren't many coastal conservation areas, yet the no-cut proposal for those areas received tremendous resistance.
Jeff: The issue of land ownership has clouded the debate for too long; once the Supreme Court reaches a decision on the pending case, discussion around laws and regulations will be easier, and we can move forward.
Bob: There are too many different people and different agendas involved. He is not an expert, nor is he much of a "consensus guy".

George added that we should look at the seaweed industry worldwide and consider the small impact of *Ascophyllum* harvesting in the North Atlantic.

11:45 Follow Up and Next Steps

Natalie thanked the panelists, particularly for their willingness to sit on a panel with people they did not agree with. She summed up how we: learned a lot about *Ascophyllum* ecologically and geographically, raised many questions regarding how to measure impact and how to manage rockweed, and realized the complexity of identifying which science is the "right" science to apply to these questions.

Jane asked participants to consider joining the Frenchman Bay Partners to continue the conversation and reiterated how the Partners work bottom-up with local agreements. The rockweed conversation will be continued at the Frenchman Bay Partners Annual Meeting on May 21, 2016. She also mentioned how we plan on using Ecosystem Services Value Decision Support Tools to help us prioritize what we value about rockweed not in dollars and cents, but in what is important to us.

An email with a follow up survey will be sent to attendees (Appendix 1, Figure 2).

12:00 Meeting Adjourned

Appendix 1

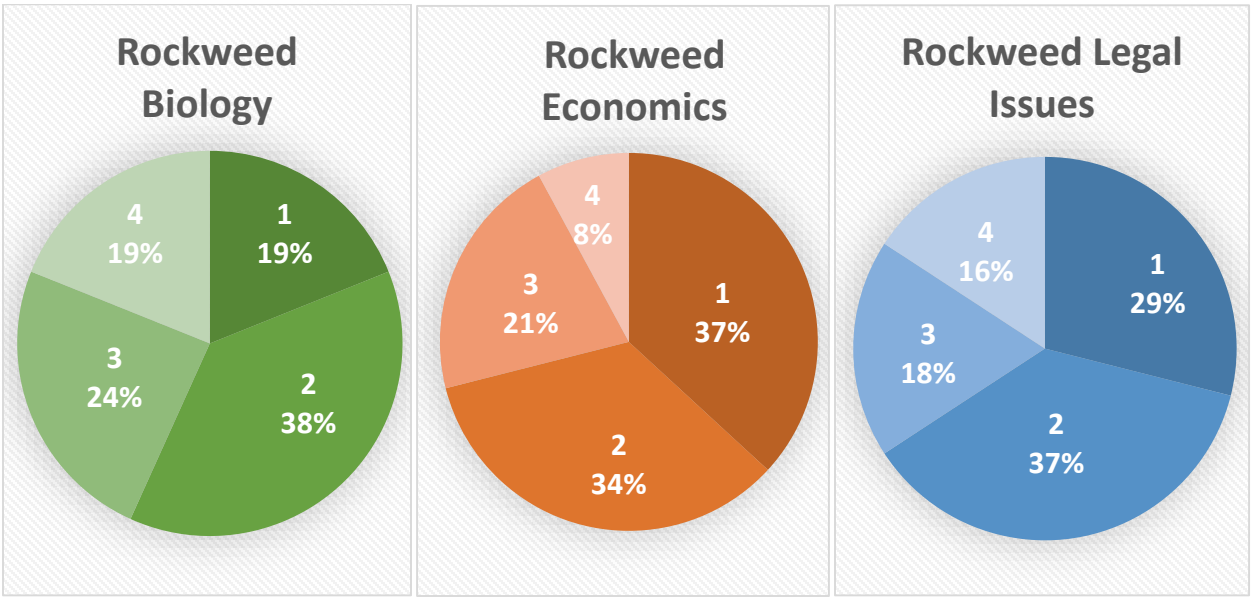

Figure 1. Rockweed knowledge rankings pre-meeting. Before the rockweed meeting, we sent out an email survey asking invitees to rank their knowledge of rockweed biology, rockweed economics, and rockweed legal issues on a scale of one to four. One corresponds with very little knowledge, four corresponds with very much knowledge. N=42.

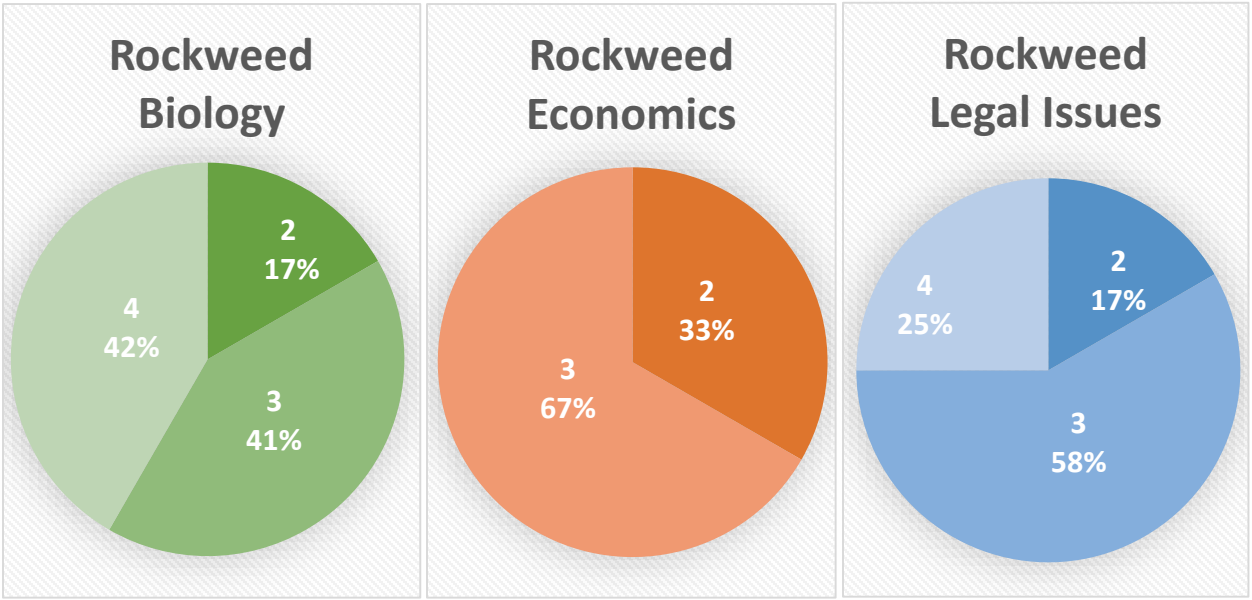

Figure 2. Rockweed knowledge rankings post-meeting. After the rockweed meeting, we sent out a follow up email survey asking attendees to rank their knowledge of rockweed biology, rockweed economics, and rockweed legal issues after listening to presentations and participating in the panel session. The scale was the same: one to four, with one corresponding with very little knowledge and four corresponding with very much knowledge. N=12.