Herring River Stakeholder Group

DRAFT Summary for Meeting #3

October 11, 2018 | 5:30 PM to 7:30 PM
Wellfleet Council on Aging
715 Old Kings Hwy, Wellfleet, MA 02667.

Meeting in Brief

The Herring River Stakeholder Group (HRSG) met for the third time on October 11, 2018, from 5:30 to 7:30 PM in Wellfleet. The Meeting included a review of the annual work plan, a project update, and an exploration of water modeling and monitoring around the Herring River Restoration project.

A poll will be conducted of members to determine the date of the next meeting. The main topic of the December Meeting will be risk management approaches during Phase 1 of the project. The January HRSG Meeting will focus on potential impacts to shellfishermen.

Action Items

Who	What
HRSG Members	• Take poll for December meeting dates • Provide a short bio to CBI & the Chair if you have not already • Invite constituents to meetings on risk management and potential impacts on stakeholders • Send comments / corrections for July and October meeting summaries • Send questions on risk management for December meeting to CBI

CBI & Chair	• Schedule December meeting, confirm presenters, develop an agenda
	• Provide email address and listserv for interested parties to opt into updates on HRSG
	• Notify public about December meeting date and topic via HRRC, HREC, public notice boards and town postings
	• Develop factsheet resource for commonly-asked questions to post online
	• Develop outreach protocols for members
	• Develop list of outstanding questions from HRSG meetings:
	  o *Landfill plume details*
	  o *Current estimate of what updated CNR dike will cost*

Find details on upcoming HRSG meetings, as well as prior agendas and materials at http://www.friendsofherringriver.org/Herring-River-Stakeholder-Group

Meeting Opening
Welcome and Introductions, Agenda Review, Minutes

Facilitator Patrick Field opened the meeting with introductions of the stakeholder group. All attending members announced their name and affiliation.

Bill Biewenga, HRSG Chair, reviewed the agenda for the meeting. Besides a brief project updates and review of the draft work plan, the primary purpose of the meeting was to help members and the public develop an understanding of surface and groundwater modeling and monitoring of the restoration project and surrounding area. The meeting ended with a public comment and question period.

Draft Work Plan– *Chair and Facilitator*
The chair and facilitator briefly presented on the current work plan, which was developed based on survey results, HRSG discussions, and HRRC feedback.

Comments and Questions on Work Plan
Q - How are we publicizing subject matter for meetings? The December meeting may have a lot of public interest. I am not aware how folks will learn about that.
There are 5 or 6 listservs and websites that HREC/HRRC/the towns can send advance notice and the agenda. HRSG members suggest making the protocol available on meeting notices, putting down each of the URLs for websites that carry these notices, including the list of ideas from the July meeting summary, and posting slides and meeting summaries on the FOHR website after meetings. CBI will remind the Towns and Friends group to post these materials

Project Updates – *Carole Ridley, HRRC*
Carole Ridley gave a brief update on work and actions over the last few months and answered stakeholder group questions.

The Restoration Committee has been working with USGS on a habitat management plan and permit applications (the first of which is to be filed with the Cape Cod Commission). There are no new developments to report on that front – the work is ongoing.

The Town of Truro has made some changes since the July meeting: the Restoration Committee hasn't been hands-on with the two towns sharing counsel. The Towns have changed the arrangement to each having an independent counsel representing them in the Herring River project. Wellfleet and Truro each have new candidates and have put any Executive Council meetings on hold until those decisions are made. HRRC will get their names, contact info, and then brief them on the project so they are up to speed for the next Executive Committee meeting.

Monitoring and Modeling of Water: Fundamental Tools for the Restoration
The facilitator noted that it seems we are still setting the stage, apparatus, and tools for the Restoration Project. The presentations in this meeting will be focused on the science of the project, with policy and risk management questions reserved for the meeting in December after this briefing. Two presentations were delivered to the group, with questions answered at the end.

Hydrodynamics of Herring River: Past, Present and Restored – Kirk Bosma, Woods Hole Group
Slides are available on the Friends of Herring River website.

- Surface water – not going into sediment transport, more about water today. History of Herring River, what state it is in now, and what the restoration project is aimed at
- Context on where things came from: 1887 image of Herring River, used to be more extensive Duck and Mayo Creek. Expansive system with entrance to Duck Harbor, with lots of intertidal marsh area.
- Natural opening of dike we'd want much wider, current opening is just one gate that lets water in, and two flap gates that only let water out. It is a very restricted entrance. Not surprising that salt mash extent in 100 years (1908 to 2008).
- Captain Dow Baker went to argue for dike due to decline in fishing industry, change in industry and development, encourage development and tourism (built Chequessett Inn), and reduce mosquitos which used to be controlled by pouring oil onto the marsh plain
    - Costly proposition back then, built dike as a tribute to him despite significant opposition. Lost salt marsh, invasive species, mosquito production (dramatic increase in spending on control), fish kills (money received from herring auction dramatically decreased). No more tidal exchange, stagnant pools of water, former salt marsh has become terrestrial and partially developed.
    - Range of tides from 10-14 feet in harbor on one side of the dike is only 1-2 feet on other side, dramatically restricted.
    - Ongoing effects of loss of estuarine productivity, closed shellfish areas, degraded habitat due to anthropogenic influence.
- The project's benefits are restoring productivity to the salt marsh, one of most forms of water habitats.
- Topography and bathymetry was carefully assessed with science, surface water precipitation and tidal exchange was studied. Developed hydrodynamic model, which has been calibrated with observations at countless locations taken of estuarine system over multiple years. Water surface elevation from observations taken by gauges has been very precise, within inches of modeled WSE.
    - Do the same thing for salt in the system.
    - Model creates a vast amount of data, produces models of water surface elevation, extent traveled, velocity, volume, distribution of salt through tidal exchange. Shows penetration of salinity, water from the harbor being driven

through entire system, based on width of opening of Chequessett Neck Road Dike Culvert.
    - They can experiment with different culvert configurations and widths, tons of info available from model. Use that to engineer design of dike, many more gates with more control of water level. Gives more control of water levels than current dike has.
- Actual process of re-introducing saltwater will be very slow via adaptive management process – relying on science and gate openings, can always slow down and take a step back and reverse.
    - Woods Hole group has many real-time sensors out there already, and whole array of instrumentation that can be added to them. Based on monitor – predict outcomes, make decision, carry out action, monitor outcomes, compare, learn/update, predict outcomes, etc.
    - Feel comforted to know you can go back to way it is now, security there. But given the large capital investment entailed, it may not make sense to do so.

Questions on Kirk's Presentation

Q – Current cost estimate for dike?

The current estimated cost for this bridge-style dike is $15M.

Q – Are there examples of other places where they have done this approach (but smaller)?

- Stonybrook in Brewster: very degraded system with lots of fragmites, fish hated it, marsh was in bad condition. They put in a new culvert with detailed model. This project won the Coastal American Partnership award because of the success of the restoration project. That was a riskier a mode than Herring River because they went in on big project without adaptive management piece. They did a post-evaluation of the model, and in this case it seems it did a great job getting them to where they wanted to go.
- Brides Brook, Connecticut: the outcome of a re-established dune and grass planting was that they had the highest alewife runs in the state of Connecticut. That was the same process of measurement, modeling, and using measurements for production and design. And, the dune withstood a major storm.

Q – With the Stony Brook project, what was acreage of salt marsh beforehand?

- It was substantial: 28-30 acres of wetlands with development on the edges, with trail system that was heavily utilized through the marsh by local people. There was less concern there about direct impacts to property, but was concern about accuracy of water levels affecting trails and bridges and salt actually killing fragmites.

Q – Current storm events… what do they look like now? What will they look like in the future? We currently get big back-ups up and downstream.

- We looked at a wide range of surge and rainfall events, and combinations of those. For precipitation alone, right now system has hard time draining because of invasive fragmites and trees. Mill Creek and other areas have poor drainage, part of that is due to dike. This should be an improvement for that.

- We looked at a very detailed at all combo events, so that ensuring under storm scenario aren't exceeding elevation you get today. All that data is available.

Q – Is your intent to think through, post-construction, using the model to provide towns with instructions on how to manage the dike to prevent excess flooding? Or close up to prevent surge?

- Yes, that type of info is available. Not sure how the Towns will use it. The problem is a lot of the time you don't know what a storm will produce, so it is hard to proactively set although you can do that using weather predictions.
- The adaptive management process is key: we can use data to make physical changes to the gate and to model those changes as the system gets restored. All our model knows is what is out there now. As the system changes, we can change the model. Monitoring stations are key.
- I agree there is an advantage with this gate for storm events. Drainage and control will be much better. And there are lots of things you can do for storm surges that you cannot do now. For climate change and sea level rise, we can throttle the gates down so tidal flows change. Because these gates can let out more than they let in, can do non-linear controls that are helpful for controlling sea level rise.

Q – What are the limitations of the model?

- We are interested in monitoring and improving model for salinity, but don't have any data now (only are able to use the standard models for saltwater convection). Below the dike, we have plenty of data.
- 10 years from now, vegetation, channels, sediment and other big changes to system out in the future are less accounted for in the model. But due to adaptive management, we can update the model in the future.
- We are very comfortable with the range of water elevations and gate openings.

Q – When we move to Phase 2, will you have data from Phase 1 so that data from that can be fed into model?

- We will actually be updating the model throughout Phase 1 as well.

Herring River Tidal Restoration and the Coastal Freshwater Aquifer– ***John Portnoy***

- We receive lots of comments concerned about the impacts of tidal restoration on freshwater aquifers. Intuitively, it might make you think it is a problem. But it is not a problem if you understand the aquifer of the outer Cape. I'm not a hydrologist but a marine ecologist. However, I have done a number of studies with hydrologists over the years, so I can give an overview of how salinity might or might not affect groundwater system. I'm also senior author on several publications related to groundwater transfer and have spent a lot of quality time with well-drillers.
- USGS and other major research institutions are present on Cape Cod

    - Very simple system – pile of sand, freshwater collects on top of sea-water saturated sand
    - Fresh groundwater flows towards ocean and bay and discharges to both.
    - Why don't two waters mix? Black and tan beer – though they are touching don't readily mix even though they are similar density
    - Small interface with a little bit of mixing
- Shape of lens of freshwater above sea level – would be higher if Cape Cod were wider, floats atop salty groundwater: freshwater lens thickness is 40x its elevation above sea level (6 ft elevation pond)
    - USGS study trying to follow septic plume in groundwater to marsh shows how groundwater at high and low tide flows under the marsh to pop up in the stream
    - Groundwater from Chequessett aquifer continues to pour into system to reduce salinity
- Wells drilled at different distances from Lower Chequessett
    - Upland wells just upstream, as soon as they get there the 8-10 ft fluctuation in tide is just 2 feet, and zero salinity.
    - Results from today confirm that there is freshwater flowing under salt marsh which floods every 12 hours and it only 3-4 ppt salt
- Good well is set in the upland 10-20 feet below water table
    - Bad well goes all the way down into salty groundwater and can be salty when it pumps hard
    - Less good well, flooded by high tides, can still be drawing fresh groundwater. Risk is being overtopped or leaking.
- USGS did geophysical electromagnetic soundings in 1989, which concluded there was ample freshwater lens thickness all around the Herring River estuary.
    - Data is available
    - Verified using seven deep interface wells, drills with solid casings all the way down through the interface. Freshwater thickness even at edge of floodplain was at least 30-40 ft and in most cases 50-60 feet. Most people are drawing water from 10-20 feet below water table.
    - That network of deep wells is in place and will be over time to measure intrusion.
- Conclusion: Saltwater does not intrude laterally into the freshwater aquifer. Salt water does not penetrate more than a few meters.
    - Studies indicate that the only risk is to tidal wells from surface saltwater

Questions on John's Presentation:

Q – Do you have these slides in PDF form and can you post them?

Yes, we can do that. We will get out these slides without animation and post on the FOHR webpage.

Q - Water in the landfill plume: any info on testing the wells on the perimeter of the plume?

- Wellfleet landfill plume for Cape Cod Commission – would need to request for that info and would need more analysis about the potential effect on any remaining contaminants

Q – Cape Cod Commission comment letter on Final Env Impact Report: Was there additional data collection on that by town – any info you have after that?

- There was a certain amount of info on the landfill plume in the FEIR. HRRC will circulate the follow-up study if there was one about the landfill plume.

Q – Can a high tide come in and push groundwater to bubble up?

- The chances of that are small because the tidal amplitude of the water table is greatly dampened as you move uphill, only one foot when you are 325 feet upland
- As observed over the spring tidal season, only mean sea level rise influences groundwater. Tidal fluctuation is not as big of a concern as SLR to Kirk.

Business Owner Input

Judith Stiles, HRSG members, queried different business owners about questions – got lots of interesting suggestions. It seems business owners are most interested in understanding how this project might affect them financially. She presented one question/suggestion from those collected: The business community wants to see a specific budget for maintaining the proposed dike and roads around it during and after construction, and who is responsible for paying it? Both towns, or just Wellfleet?

- There are a set of financial questions about the project, some of which are known and some are not. The dike and road are maintained by Wellfleet, and will continue to be afterward. There may be a cost to conduct an engineering study. Roads will be covered under Chapter 9. Though people fear the cost of maintaining the dike after it is installed, most of that cost will be towards the point person who makes adaptive management decisions. They have a vague idea now, but want to see a budget for the project, and potential sources of funding. The cost of maintenance of roads will probably stay the same, but stakeholders would like to see concrete figures for any changes.

Public Comment

One commenter had a property that may be affected, as well as a local business. They have not been asked to comment with respect to their business, and are surprised that an abutting business wasn't contacted.

- The HRSG chair reminded the group and the public that questions in writing can be accepted at any time. The committee members, though they are citizen volunteers, can follow up with you at any time.
- The HRSG plans to send out a mailing to all abutters and relevant neighbors to the project in order to everybody's input and comments. The Friends of Herring River Website has contact info about how to get in touch with the group until that goes out

- For future outreach to the business community, Judith will use the Chamber of Commerce directory,

Paul Faxon, HRSG member, asked if this is an avenue or vehicle adequate to get input from constituent groups that we are supposed to represent. He is the member at large for Wellfleet but is struggling with what it means to be a representative. He said he feels, especially with the context of the December meeting, the group may need to look at a little more outreach. Some constituencies are defined and it is easy to access input. Others are more challenging, and we will fail at our charge if this group does not make good faith effort to reach out.

- The group suggested making an announcement at town meeting about the next HRSG meeting, and referencing the website with contact info to direct public questions.
- The group could also hold a program at the Wellfleet forum, which gets good turnout.
- There could be a one-time postcard to the abutters list asking them to join the email list on town meetings.
- The group also suggested setting up an HRSG email address that forwards to everyone.

Al Kraft, HRSG members, said several people in his constituency would like the group to consider adding a time to discuss specific issues that specific stakeholders might have, providing a vehicle for people to hear their concerns.

- Bill or the facilitator will reach out to Al for more detail on the idea to explore whether the public comment period in each meeting serves this purpose adequately or not.