

## RESP HYDROPOWER STAKEHOLDER WORKSHOPS

### Section Summary:

- The RESP hydropower stakeholder process included two all-day workshops that brought together a diverse set of state and federal agencies, non-governmental organizations, and other experts to discuss a wide range of implications relating to hydropower development in Rhode Island.
- The goal of the first workshop was to review and provide recommendations on RIDEM's Draft Guidance on Siting Considerations for Development of New Hydropower Facilities and to discuss how RESP research could be tailored to complement the RIDEM document.
- The goal of the second workshop was to work with stakeholders and key decision makers to explore the potential for river restoration and low-impact hydropower development to thrive synergistically on Rhode Island rivers.
- One of the main contributions proffered by stakeholder participants is the evolving vision of low-impact hydropower development as an avenue to attract attention and funding to support fish restoration, dam safety upgrades, and other needed improvements to Rhode Island rivers. Stakeholders described an ideal scenario wherein river restoration and hydropower development are managed synchronously, rather than through a piecemeal approach.

The RESP relied on several forms of stakeholder participation to ground hydropower research in a Rhode Island context, identify new needs and questions for further investigation, and enable key stakeholder groups to provide input into statewide siting guidance on hydropower development. A subsequent chapter of this report, Stakeholder Process and Public Engagement, discusses the evening stakeholder meetings that were held throughout the RESP process to share information and opinions on wind, solar, and hydroelectric energy options for Rhode Island. This section describes an additional stakeholder component that was specific to the hydropower portion of the RESP: a series of two all-day workshops that brought together a diverse set of state and federal agencies, non-governmental organizations, and other experts to discuss a wide range of implications relating to hydropower development in Rhode Island.

### *Rhode Island Hydropower Workshop I*

On February 28, 2012, the URI Outreach Center and RIDEM convened an all-day Hydropower Workshop at URI's Bay Campus. The goal of the workshop was to build agreement on ways that the State should guide environmentally sustainable hydropower development in Rhode Island. Thirty-four people attended the workshop, representing a range of state and

federal agencies, non-governmental organizations, and other groups. Participants are listed in Table 5.

The main focus of the day's activities was to review and provide recommendations on RIDEM's Draft Guidance on Siting Considerations for Development of New Hydropower Facilities (RIDEM 2012), and to discuss how RESP research could be tailored to complement the RIDEM document. To facilitate conversation, the URI and RIDEM team identified the following objectives for the workshop:

- Outline the state's current approach/strategy for exploring and managing hydro-electric power.
- Confirm that the data being produced by the RESP is appropriately informing the siting guidance process.
- Provide feedback to RIDEM on draft guidance that represents a spectrum of stakeholders and interests.
- Identify additional informational needs and known sources of further information.
- Plan next steps for RIDEM guidance document and broader policies for environmentally sustainable hydroelectric power in Rhode Island.

The workshop began with overviews of the draft RIDEM document and the RESP project, presentation of the RESP hydropower online map viewer (described in the RI Energy.org Chapter of this Report), and summaries of fish restoration and water quality considerations related to dams on Rhode Island rivers. However, the bulk of the workshop consisted of small-group discussions on five topics: (1) the division of roles between the RIDEM draft guidance document and the RESP; (2) additional issues and information that should be considered in the RIDEM document; (3) issues that should not be included in the RIDEM document; (4) any additional data needed; and (5) opportunities, constraints and next steps to developing economically viable and environmentally sustainable hydropower in RI.

Comments contributed by stakeholders during small-group discussion were vital to improving both the RIDEM guidance document and the RESP project. With regard to the appropriate division of roles between the RIDEM guidance document and the RESP report, groups largely agreed that the RIDEM document should be more narrowly focused on the environmental impacts of hydropower and the regulatory framework surrounding them, while the RESP report should have a broader focus, encompassing hydropower potential at selected dams across the state, and discussing hydropower in the wider context of fishway restoration, watersheds, and other uses of Rhode Island's rivers.

With regard to informational needs, stakeholders contributed the following suggestions, which were incorporated into the RIDEM guidance document and/or the RESP report:

- **Changing conditions:** Stakeholders stressed that RIDEM and RESP analyses are based on current technologies and conditions, and are subject to change as technologies improve and river conditions change.
- **Mechanical versus electrical power:** Stakeholders mentioned that few of Rhode Island's dams were built to generate electricity; most were originally built to power mill machinery using mechanical, not electrical, forces. Some stakeholders questioned how well these dams could be adapted for generation of hydroelectric power, and suggested the potential for additional and unexpected challenges due to this distinction.
- **Fish passage:** Stakeholders pondered what should happen to existing fish passage modifications on dams converted to hydropower: Will dam developers be required to refund costs of existing mitigation measures? Will they be required to take additional mitigation measures?
- **Resource assessment:** Stakeholders suggested that the RESP online mapping viewer tool should include information on hydraulic height, in addition to existing data on structural height, of existing dams. RESP researchers responded that this is a long-term goal, since that information does not presently exist and would have to be gathered through field measurements.
- **Climate change:** Stakeholders recommended adding a discussion to the RESP and RIDEM documents about the effects of climate change on river flow and hydropower potential. The RESP team responded to this suggestion by adding Section 3.1.3 of this chapter.

Stakeholders identified several perceived constraints relating to development of low-head hydropower on existing dams in Rhode Island rivers. These included: the complexity and fragmented nature of regulations relevant to the construction of new hydropower facilities on existing dams; the high number of agencies with jurisdiction over various aspects of hydropower projects; the high monetary investment necessary to get a hydropower project up and running; the high cost of doing environmental remediation at existing dam sites; the fact that most existing dams were originally built for mechanical, not electrical, purposes; the unknown or complex ownership status of many dams in Rhode Island; and liability issues surrounding modification of old dams.

Stakeholders also discussed perceived opportunities related to conversion of existing dams to hydropower facilities. Several saw the large number of existing dams in Rhode Island as

an untapped opportunity for economic development, and many suggested that hydropower development might also open a window to new environmental opportunities. Specifically, stakeholders saw potential environmental opportunities in devising ways to piggyback on new hydropower developments to improve river conditions and to provide funding for river restoration efforts.

*Rhode Island Hydropower Workshop II*

On June 19, 2012, the URI Outreach Center convened a second all-day Hydropower Working Session at URI’s main campus. The goal of the workshop was to work with stakeholders and key decision makers to explore the potential for river restoration and low-impact hydropower development to thrive synergistically. Forty people attended the workshop, from a range of state and federal agencies, non-governmental organizations, and other groups. Participants are listed in Table 5.

**Table 1. Stakeholder Participants at RESP Hydropower Workshops, February 28, 2012 and June 19, 2012**

<p><u>STATE AGENCIES</u></p> <ul style="list-style-type: none"> <li>▪ R.I. Rivers Council</li> <li>▪ R.I. Economic Development Corporation (RIEDC)</li> <li>▪ R.I. Historical Preservation and Heritage Commission (RIHPHC)</li> <li>▪ R.I. Department of Environmental Management (RIDEM)</li> <li>▪ Coastal Resources Management Council (CRMC)</li> <li>▪ Governors’ Office</li> <li>▪ R.I. Office of Energy Resources (RIOER)</li> <li>▪ R.I. Statewide Planning Program (RISPP)</li> </ul>	<p><u>FEDERAL AGENCIES AND AFFILIATES</u></p> <ul style="list-style-type: none"> <li>▪ National Park Service (NPS)</li> <li>▪ Federal Energy Regulatory Commission (FERC)</li> <li>▪ National Marine Fisheries Service (NMFS)</li> <li>▪ U.S. Fish and Wildlife Service (US F&amp;W)</li> </ul>
<p><u>WATERSHED COUNCILS:</u></p> <ul style="list-style-type: none"> <li>▪ Blackstone River Watershed Council</li> <li>▪ Wood-Pawcatuck Watershed Association</li> <li>▪ Woonasquatucket River Watershed Council</li> <li>▪ Breakwater Preservation Conservancy</li> </ul>	<p><u>NONGOVERNMENTAL ORGANIZATIONS</u></p> <ul style="list-style-type: none"> <li>▪ Conservation Law Foundation</li> <li>▪ Save the Bay</li> <li>▪ Narragansett Bay Estuary Program (NBEP)</li> <li>▪ Trout Unlimited</li> </ul>
<p><u>MUNICIPALITIES</u></p> <ul style="list-style-type: none"> <li>▪ City of East Providence</li> <li>▪ Town of West Warwick</li> <li>▪ City of Warwick</li> <li>▪ Town of Charlestown</li> </ul>	<p><u>CONSULTANTS</u></p> <ul style="list-style-type: none"> <li>▪ Essex Partnership</li> <li>▪ Mimer Energy</li> </ul>

The second RESP Hydropower Workshop was organized at the request of stakeholders who attended the first RESP Hydropower workshop. These stakeholders felt that the State would benefit from further conversation about balancing environmentally sustainable hydropower with river restoration. The second Hydropower Workshop created a neutral forum for participants to discuss whether river restoration and low impact hydro development could occur together in

Rhode Island, and if so, what key actions would need to take place to stimulate their joint and mutual advancement. The workshop exercises provided an opportunity to test a more integrated strategy to river systems planning and management where restoration and development are evaluated synchronously, rather than through a piecemeal approach. To facilitate conversation, the URI team identified the following objectives for the workshop:

- Discuss and identify possible criteria for selecting river systems (e.g., river runs, specific sites, etc.) where low impact hydropower development and river restoration could occur synergistically.
- Discuss how these criteria align with the current state strategy/approach for river system management.
- Apply criteria to identify potential river segments where there could be synergistic river restoration and low impact hydro power basins and rivers.
- For these possible areas, discuss and understand the opportunities and challenges of balancing river restoration and developing hydropower.
- For these sites and more generally, define what next steps would be supporting and promoting low impact, mutually supportive restoration and hydropower efforts.

The workshop consisted of three main parts: two breakout activities and a panel presentation. During the first breakout session, participants compiled criteria for selecting ideal sites for both river restoration and low impact hydropower development. The general consensus among participants was that co-location of hydropower and river restoration is a challenging endeavor dependent on highly site-specific considerations, but that it is possible to identify some generally appropriate selection criteria. Notably, each group at the workshop independently settled on a strikingly similar set of criteria. The following list summarizes common criteria proposed by participants for selecting ideal sites for both restoration and hydropower:

- **Dam removal is not an option:** Stakeholders agreed that joint development of hydropower and river restoration is most appropriate in cases where removal of a dam is not an option. Where dam removal is possible, it tends to be the most ecologically beneficial option for river restoration – an option that is clearly not aligned with development of hydropower. Possible indicators that removal of a dam is not feasible include a high degree of urbanization around the dam, presence of flood control structures and/or drinking water supplies, RIDEM designation as a high-hazard dam, and other societal benefits associated with retaining the existing dam structure.

- **Minimal competing uses for flow and water quality:** Stakeholders felt that this precondition might be a useful measure of whether a river system can accommodate provision of energy services in addition to maintenance of ecosystem services.
- **Project is economically viable over the long term:** Stakeholders recommended that hydropower and restoration be considered together only when a proposed new hydropower facility is economically viable. Such projects would be characterized by adequate power resources, feasible interconnection, and above marginal returns.
- **Facility improves environmental conditions over the long term:** Although hydropower can have negative environmental impacts, stakeholders suggested that there may be instances where hydropower could actually provide a mechanism to improve environmental conditions. For example, in cases where hydropower is the only funding source available for restoration, development might be a strategic way to finance new fishways or dam removals.
- **Buy-in:** Stakeholders stressed community engagement as a necessary precondition for selecting sites where hydropower development and river restoration could beneficially occur together. Garnering support from state government, federal agencies, NGO's, downstream residents, and local businesses represents a crucial step in actualizing any proposed synergy.

After the first breakout session, a panel presentation took place, describing the existing regulatory framework for managing river restoration and low-impact hydropower development and presenting technological innovations useful for encouraging the synergistic development of these two goals. The three panelists, representing RIDEM, USFWS, and hydropower development interests, began by discussing the compatibility of existing hydropower and restoration technologies with the criteria identified during the first breakout session. Panelists provided numerous examples of technological solutions suitable for mitigating or overcoming possible detrimental environmental ramifications associated with hydropower use on a river.

In addition, the panel explored ways in which existing regulatory/management frameworks for hydropower development and river restoration might shape the ability to achieve synergies between the two activities. Panelists stressed that although regulatory compliance can simultaneously be achieved for hydropower development and river restoration projects independently, attainment of higher-level synergistic outcomes may require new approaches to project planning that are both strategic and holistic. Notably, hydropower activities and river restoration projects must currently obtain many of the same authorizations from many of the same agencies (see Table 4 for a comparison of Federal, State, and local regulations applying to permitting of hydropower and river restoration activities); a strategic approach might involve streamlined permitting of both activities at once.

Lastly, panelists described their perceptions of the opportunities and barriers related to achieving synergy between hydropower development and river restoration. This description drew on examples from other states showing how thoughtful hydropower project relicensing agreements have led to beneficial environmental and economic outcomes.

In the second breakout session, workshop attendees worked together to envision how the criteria identified in during the first breakout session could be applied to specific locations in Rhode Island. This thought exercise served to elucidate what a synergistic approach to river restoration and hydropower might look like on the ground. Each group selected a case study area and used the RESP hydropower online map viewer to identify opportunities and challenges related to the co-location of hydropower and restoration in its chosen area. Case study areas included the Blackstone River, the Pawtuxet River, and the Ten Mile and the Woonasquatucket Rivers (considered as a single area).

Each group also pondered the steps necessary to precondition the concurrent development of hydropower and river restoration. Participants recommended the following possible measures:

- **Improve existing hydropower:** Begin by finding ways to improve the efficiency and operations of existing hydropower. There are known opportunities to increase generation while providing for more consistent flows at existing hydropower sites.
- **Expand future planning:** Develop watershed-scale “Comprehensive Plans”. These plans would be filed with FERC and would formalize basin-wide strategies for restoration and hydropower on Rhode Island rivers. Development and restoration efforts would be required to adhere to the principles identified in these plans. Plans could include novel concepts advancing a systems management context, such as offsite mitigation for hydropower projects or evaluation of cumulative impacts of multiple projects (i.e. flows, water quality, fisheries, aesthetics and recreational/cultural/historic resources, etc). Watershed planners might also contemplate inclusion of “investment portfolios” showing potential projects considered economically feasible; this approach could be used to facilitate package development of multiple sites at once.
- **Fine-tune permitting procedures:** Reach a settlement agreement to cover environmental and mitigation requirements for multiple sites at once, in order to produce higher efficiency during the FERC licensing process. Adopt a funding mechanism to permit possible offsite mitigation.
- **Streamline management:** Consider formalizing a mechanism for coordinating and managing the operations of multiple plants on a river.

- **Take legislative action:** Clarify a price and schedule for hydropower in the Distributed Generation (DG) program. The DG program in its current form calls for projects to begin producing power on an accelerated timeline, effectively excluding hydropower due to the protracted length of the FERC licensing process.
- **Continue the stakeholder process:** Establish a post-RESP process to continue involving stakeholders in a conversation about joint planning and management for hydropower and river restoration. Involve the energized and knowledgeable stakeholder communities that already exist in each watershed. Bi-state coordination may be beneficial in the case of Ten Mile and Blackstone.

#### *Additional Research Needs Identified by Stakeholders*

During both hydropower stakeholder workshops and throughout the RESP process, hydropower and river restoration stakeholders identified several knowledge gaps relevant to the development of hydropower on Rhode Island rivers. This section presents a list of priorities for future research and discussion. Some of these pending questions can be answered through continued conversation among policy makers and stakeholders; others may benefit from use of future hydropower projects as living laboratories to help illuminate lingering unknowns.

- **Technological innovation:** Hydropower technology for low-head applications is evolving. Future hydropower research in Rhode Island should explore emerging hydropower technologies that promise a lower impact to ecosystems and water quality than present mainstream technologies.
- **Alternative hydropower technologies:** Since pursuing full-fledged new hydropower facilities requires large investments, it may be more feasible to first explore the renewable energy production benefits that could be attained by improving the efficiency of existing hydropower plants by incorporating alternative hydropower technologies.
- **Fish passage restoration success rates:** Improved metrics for assessing progress towards fishway restoration goals are needed to inform mitigation requirements attached to hydropower permits and to advance integrated restoration programs. Additional data is needed on how hydropower affects fish passage at sites where restoration efforts and hydropower development coincide.
- **Development of hydropower on state-owned dams:** Several dams in Rhode Island exist on state-owned land. Presently, it is unclear whether these dams should be opened up to hydropower development through sale, lease, or another method.
- **Legal treatment of existing fish passage restoration projects:** In recent decades, many dams in Rhode Island have received modifications to make them usable by diadromous fish

for upstream passage. It is presently unclear how these existing fish passage modifications would be treated in the event that these dams undergo further modification in conjunction with hydroelectric development.

- **Dam safety requirements:** Many of Rhode Island's 742 dams do not serve their original purpose and pose a public safety liability. While RIDEM is required by the Dam Safety Program to visually inspect every dam in the state. RIDEM does not have the staff or the resources to make full engineering analyses of the structural integrity of each dam (Dam Safety Report, 2010 pg 25). Hydropower development may represent a strategy to create clear ownership status and revenue streams for partially addressing this statewide dam management issue.