AGM Common Report Form

Check One: ☐ Interim Report (Submit only this cover sheet)
X Final Report (Submit this cover sheet and complete page 2 using no more than three pages.)

Submitted to: Massachusetts Environmental Trust Date: December 21, 2012

Name of Organization: Jones River Watershed Association, Inc.
Fiscal Agent (if different from your organization): _____
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Contact person: Pine duBois
Title: Executive Director
Program Name (if applicable): *Tide is on Our Side: Tussock Brook Restoration*
Grant Amount: $22, 470.00
☐ General Operating X Project Support ☐ Challenge Grant ☐ Capital/Endowment

Period that this report covers 08/01/2011 to 12/26/12

Please provide a complete expense report indicating how the grant award was used. **If this is an Interim Report**, please indicate expenses to date.

		Participation	**MET support to date**	**Match support**
Task 1	Tidal Fluctuation and Inundation Assessment	JRWA, CZM, DER	$5,180	~$10,000 (DER in-house and contracted)
Task 2	Compile Existing Information:	JRWA, Kingston, Duxbury, CZM	$1,250	$1,360
Task 3	Species and Habitat Monitoring	JRWA, Kingston, Duxbury, CZM, DER, SLRHS, DEP	$3,780	$1,600 + Unappraised value of sampling analysis by DEP
Task 4	*Tide Gate Removal, Disposal, and Adaptive Management. (*scope modified as described in narrative)	JRWA, Kingston, Duxbury, DER, CZM, DEP, MA DOT	$10,080	$1,600
Task 5	Education and Outreach	JRWA, Kingston, Duxbury, DER, CZM, DEP, MA DOT	$2,180	$2,400

FINAL REPORTS MUST BE SUBMITTED *NO LATER THAN FIFTEEN (15) DAYS* PRIOR TO THE CLOSE OF THE GRANT CONTRACT PERIOD.

Please respond to each of the following questions using up to 3 (three) pages in total, not including the cover page. Your responses should focus specifically on the funded project or program, if applicable, or in the case of general operating grants, on your entire organization.

1. *Referring to the goals and objectives described in your original grant request (or any revisions submitted subsequent to the grant award), please indicate the following:*
   a. *What were your major accomplishments?*

While have not yet met our ultimate goal of removing the tide gate (Task 4 of 5), we have set the stage to accomplish that in the near future, and along the way we have accomplished an even more important goal of building partnership amongst multiple agencies and entities to work together on regional restoration goals. The following are our task-by-task accomplishments under this project, which began during the summer of 2011:

- **Task 1: Tidal Fluctuation and Inundation Assessment.** As described in our initial proposal, JRWA and CZM established several monitoring stations to collect tidal data upstream and downstream of the tide gate. Data loggers were deployed at the stations for several months in order to capture a range of tidal cycles and flow conditions. This work was performed through volunteer efforts without funding. This precluded us from conducting the land survey that is required in order to benchmark the sampling locations. Under Task 1 of this project we conducted a land survey at the existing monitoring stations in November of 2011. The land survey also extended throughout the >20 acre project area identifying key topographic features that will determine the extent of tidal inundation and potential flood routes and locations.

  During the process of the land survey and tidal inundation data analysis JRWA made one the project's key partnerships. We consulted with MA Division of Ecological Restoration (DER) on the tidal inundation data relative to similar tide projects DER had recently conducted. DER's interest prompted JRWA to apply for, and receive, Priority Project status with DER, which we received early in 2012. This status allows access to DER's funding and technical services. DER immediately became intensively involved and assisted us with the data analysis, including expanding the analysis to include recently acquired coastal LiDAR information. Additionally DER contracted with an engineering firm (Geoyntec) to field calibrate the LiDAR data and conduct an extended low-property and flood plain mapping of the Tussock Brook area. Geosyntec also conducted a detailed survey of the tide gate and culvert structures. This work was well beyond the initially planned MET scope of work, but was extremely valuable and was achieved as a result of momentum gained under the MET funded activities. The results are a series of memos and survey plans that provide high resolution detail of the entire restoration area. All of this was critical for engaging MA DOT (discussed below) and will be a requirement for achieving the final permitting for the expanded project.

- **Task 2: Compile Existing Information.** JRWA compiled all of the existing information pertinent to the project area. The existing information pieces described in the original proposal were all collected and in many cases significant additional information was also obtained. These included:
  - All land ownership and boundaries throughout the project site.
  - MA DOT and Town of Kingston plans and information related to the Tussock Brook tide gate and Landing Road. These plans appeared to have been lost. MA DOT had no record of the plans of the tide gate, which lead to technical questions about the history and details of construction. Eventually JRWA and CZM conducted an exhaustive search of the Town of Kingston DPW record archives and uncovered the original design plans for the tide gate installation in 1954 during construction of Route 3. These designs will be a critical piece in the permitting of removal, and established the MADOT ownership.
  - MA Dept of Fish and Game data related to fisheries and wildlife in the project area. This includes DMF's habitat assessments for river herring spawning potential at the headwaters of Stony Brook.
  - MA DEP and MA DMF data related to water quality in the project area.
  - LIDAR and Field survey as described above.
  - Identification of stormwater outfall locations, watersheds, ownership, condition, and related water quality data. As outfalls were identified JRWA became interested in going beyond identification by conducting characterization assessments as well. Knowing that Tussock Brook has had historically poor water quality we sought to identify source contributions in order to make determinations about tide gate removal as a solution to water quality impairments. JRWA coordinated with MA DEP and the Towns of

Kingston and Duxbury to conduct a stormwater assessment and source tracking program around Tussock Brook. This capitalized on monitoring being conducted under the Towns' 604(b) grant programs.

- **Task 3: Species and Habitat Monitoring.** The Tussock Brook Tide Gate acts as a very specific break point between natural estuarine function and an altered (impaired) state. JRWA and partners intended to conduct a species inventory above and below the tide gate before and after removal. We have found in-stream and upland wildlife species monitoring to be extremely difficult. Given the challenges of access and the significant tidal fluctuations, fish traps are impractical and potentially harmful to in-stream fish. As a result we have primarily focused on plant species as indicative of habitats for the monitoring component. JRWA and the Town of Duxbury conducted and wetland assessment of the project area documenting flora indicators of various habitat types. Additionally, JRWA worked with Silver Lake High School's (SLRHS) AP Science Program on habitat monitoring. Two SLRHS students conducted a survey of the extent of *Phragmites australis* in the Tussock Brook marsh complex. This invasive species has long been associated with disturbed habitats and has been considered a low-value habitat as compared to native marsh species. More recently the role of *Phragmites* has been studied in the role of coastal dynamics in response to sea level rise and long term habitat stability. Post-removal monitoring will be conducted by JRWA, but will be outside the period of performance of this grant.

  In addition to habitat mapping and monitoring JRWA ramped up the water quality monitoring component of the project (water quality ultimately being a habitat component). Working with DEP and the Towns of Kingston and Duxbury, JWRA conducted extensive wet weather, dry weather, and human marker bacterial sampling throughout the Tussock Brook watershed. Storm drains, tributaries, natural and manmade drainages, were all targeted in an attempt to identify primary sources. Through an adaptive approach of repeated rounds of sampling and testing the partners are identifying key locations to target for implementation of water quality improvement measures. Removal of the tide gate continues to be a primary mitigation measure to improve water quality through increased tidal flushing.

- **Task 4: Tide Gate Removal, Disposal, and Adaptive Management.** This task was not accomplished as described in the original proposal. A number of factors held us back from completing this goal. However, in pursuit of this goal we accomplished several other goals that will ultimately lead to accomplishment of the primary object in a more sustainable and cost effective way than originally conceived. JRWA's initial intention was to conduct the tide gate removal in-house under the scope of the grant. As the project developed it became clear that overall project would be greatly improved by removing not only the wooden flapper gate but also the concrete header, sidewalls, and sill that additionally act as significant hindrances to flow and flushing. Initial investigations of the structure suggested that the flapper portion of the gate was the primary obstruction to flow. However, after obtaining and review the design plans it became clear that extensive concrete framing had been included as part of the gate installation. All of this additional concrete substantially reduces the cross-sectional area of the culvert and would greatly restrict flow even with the flapper removed. This infrastructure is much larger and challenging in terms of removal and is beyond the abilities of JRWA alone and beyond the budgets of this grant. JRWA adapted and moved into a coordinator role in order to bring the resources of multiple agencies into the program to achieve the full removal in the most effective and sustainable way, and especially to engage the resources of MA DOT.

  By applying for and achieving DER Priority Project status we were able to greatly extend the topographic mapping and tidal inundation study efforts. With that expanded data set we have brought MA DOT (property owner) into the project as an active partner. MA DOT has taken up the project and has met with the other partners on site several times. MA DOT sees the project in several ways 1) necessary maintenance of degraded infrastructure, 2) low-hanging fruit in terms of meeting their new "GreenDOT" restoration goals, and 3) low-hanging fruit in terms of improving water quality around their infrastructure. MA DOT is working within its own methods and protocols to pursue the tide gate removal. Currently DOT agents are working with a consultant to develop a two dimensional depth averaged hydrodynamic model to evaluate the effect of removing the tide gate on tidal exchange, including water surface elevations and salinity. This work will expand upon the data already collected by JRWA, CZM, and DER. We believe that having MA DOT take the lead on these studies and the ultimate removal creates a more cost effective and sustainable solution at the site. DOT has far greater in-house capabilities in terms of the permitting process and infrastructure modifications than any of the other partners. Additionally we believe, that creating a new partnership amongst these multiple entities in a key resource area, such as Tussock Brook, has long-term value that exceeds this discrete project.

- **Task 5: Education and Outreach.** JRWA worked with the SLRHS AP Science Department to bring a pair of students into the project. As part of a class project these students conducted a mapping of the invasive *Phragmites australis* throughout the Tussock Brook marsh complex. The students met with JRWA Board member Wendell Cerne and through their class in AP Biology have completed their report in the fall of 2012. The majority of our outreach efforts have focused on bringing multiple agencies into the project. By pursuing the involvement of Mass Bays Program, DER, MA DOT, DEP, Kingston, and Duxbury we have set the stage for a highly sustainable and high profile restoration project. The attention of these agencies on this high-potential marsh restoration we hope will set an example for local and regional partnerships.

b. *What steps or actions were used to meet your objectives and goals?* These are described in above narrative.

c. *What measures were used to determine your progress?* Completion of tidal fluctuation monitoring, water quality collection and analysis, field survey completion and reconciliation with LIDAR, wetland and habitat mapping, and acceptance by MADOT of responsibility for pursuing removal. These are all described in greater detail in the narrative above

d. *What were the unexpected results or key learnings you would share with funders?* 'Momentum' has been the key to this project. JRWA and CZM have identified the site as having high restoration potential for over a decade. With MET's funding we were able to finally get moving towards that goal. The inertia created by these early steps engaged the attention of the Kingston and Duxbury. As the Towns saw the connection to water quality (The Jones River estuary is 303 d listed for pathogens and the greatest source of Nitrogen to the Bay system) they encouraged additional participation from DEP which was already funding water quality improvement projects in the area. With preliminary tidal data JRWA was also able to capture DER's attention. DER's involvement immediately lead to significant gains in system understanding. With the credibility of a DER Priority Project status and the agency connections of DER and CZM we were able to make a significant case for MA DOT's involvement. That momentum has carried us to this point where we are poised to conduct the restoration in a more comprehensive way than initially envisioned.

2. *Describe any setbacks encountered during the period of this grant.* The biggest setback was the realization that the in order to maximize the restoration we would need to expand the effort beyond the MET funding and beyond our in-house capabilities.
   a. *How did these setbacks impact your organization or project?* This did not have a significant impact on the organization. We adapted to the setback and have taken a new and better approach.
   b. *How were these setbacks addressed*? Changing our role from "implementer" to "coordinator" has allowed us to actually expand and improve the project by getting more partners involved.

3. *Who else has funded this project (or your organization), and at what level? If total proposed budget amount was not raised, indicate if program goals were altered in any way.* We used all of the MET funding in an adapted manner in order to leverage contributions from other partners to expand the project. Direct and contracted technical support from DER (~$10K) added significant value to our planned data set and built the foundation for MA DOT's involvement. Two years of water quality sampling, analysis, and reporting by DEP and Kingston (the monetary value is undetermined but significant), expanded the understanding of the existing condition and have set the stage for implementation of improvements. Ultimately MA DOT's involvement should lead to tide gate removal and restoration at a financial level that we could not have achieved under existing funding. JRWA also had organizational support from private individuals and members of $30,000 in 2011 and 2012 for general operations.

4. *What steps are being made to ensure the sustainability of your project or organization beyond this grant period?* As described in detail above, the collaboration of partners is what will ultimately make this a sustainable project. In particular, the involvement of MA DOT playing a lead role in pursuing removal of the structure will create a long-term solution at the site. Additionally, we hope this can be a model for other sites.

5. *If your program involved collaboration with other organizations, please comment on its effect upon the program.* This has been described in detail above.

Check with individual funders about their requirements or additional attachments:

____ Promotional/dissemination materials (i.e. brochures, flyers, ad copy)
____ News clippings
____ List of current Board of Directors
____ Most recent audit, account review, or end of year financial statement