

Nyanza Natural Resource Damages Funds Final Report

Introduction

As part of the Nyanza Natural Resource Damages Superfund site settlement, the Trustees asked the CISMA to manage and utilize \$1,047,500 in Tier 1 funding to control aquatic weeds in the Sudbury River Watershed. This money supported mapping, monitoring, and bio-control of purple loosestrife (*Lythrum salicaria*) in the Sudbury River from Ashland to Concord. As well as mapping and monitoring water chestnut (*Trapa natans*) in the Sudbury, Assabet and Concord Rivers, and in 130 acres of ponds in the Hop Brook Watershed, as well as focused control efforts on the main stem of the Sudbury River (Exhibit B). To see the final reports of the water chestnut mapping and beetle monitoring projects please see our website: <http://cisma-suasco.org/projects/grants/currentgrants>

In 2013 the CISMA spent \$449,091 of the funds that were disbursed. The funds were allocated between the U.S. Fish and Wildlife Service (USFWS) and Mass Audubon (MAS), acting as the fiscal agent of the CISMA (Exhibit C).

In 2014 the CISMA spent \$228,801 in funding that was available. The funds were all allocated to Mass Audubon, acting as the fiscal agent of the CISMA (Exhibit D).

In 2015, the CISMA spent \$252,379.46 of funds which were allocated between the USFWS and MAS, acting as fiscal agent for the CISMA (Exhibit E).

In 2016, the CISMA spent \$ 117,228.54 formally utilizing all funding allocated for their projects (Exhibit F).

I. Purple Loosestrife

Goals:

The goals of this part of the project were to eliminate the dominance of purple loosestrife along the Sudbury River from Ashland to Concord and to allow the native plant species to re-establish themselves. It is estimated that 3,000-5,000 beetles will have to be released per acre per year to establish viable beetle populations for effective biocontrol within the project time frame. The main components of this project were to:

- Map the extent of purple loosestrife in wetlands along the Sudbury River from Ashland to Concord
- Determine where viable *Galerucella* beetle populations are currently present
- Rear or purchase *Galerucella* beetles
- Release beetles in areas where loosestrife is present at high density and beetles are not already established
- Monitor the areas where beetles are released

2013 Accomplishments:

Mapping and Monitoring for Purple Loosestrife and Galerucella Beetle Abundance:

Mass Audubon was selected by the CISMA Steering Committee to complete the purple loosestrife elements of the projects. Mass Audubon staff mapped the abundance of Purple Loosestrife (*Lythrum salicaria*) in 3,284 acres of wetlands in the mainstem of the Sudbury River, from the oxbow off Little Farms Road in Framingham to the confluence with the Assabet River in Concord (Exhibit E). They found that loosestrife cover was high for 171 acres of the study area. They also monitored sites where *Galerucella* beetles had been previously released, and assessed the abundance, growth, and vigor of loosestrife at those sites. *Galerucella* beetle releases appeared to have been an effective bio-control agent at several sites where loosestrife cover and/or vigor and growth were significantly low. Mass Audubon's final report recommends future release of beetles at the following locations:

- Pantry Brook Wildlife Management Area in Sudbury, MA;
- USFWS GMNWR Heard Pond wetland complex in Wayland, MA;
- Rt. 20 wetland complex in Wayland, MA;
- Rt. 2 wetland complex in Concord, MA;
- Baiting Brook Reservation in North Framingham, MA;
- USFWS GMNWR Water Row wetland complex in Sudbury MA.

Rearing and Releasing Beetles for Biocontrol of Purple Loosestrife:

U.S. Fish and Wildlife staff hosted a demonstration beetle rearing facility at Assabet River NWR. Seven CISMA partner organizations participated in training sessions designed to prepare other CISMA partners to raise beetles in 2014 and 2015. The demonstration site reared approximately 38,000 beetles which were released at sites that were known previously to have high concentrations of purple loosestrife within the SuAsCo watershed.

The CISMA Coordinator contacted the Middlesex Bee Keepers Association in early 2013 and gave a presentation to the group in November. Bee keepers with hives within a 2 mile radius of the proposed project sites are being identified. Bee keepers are concerned that purple loosestrife control will remove an important source of nectar for their bees. The CISMA Coordinator communicated the importance of controlling invasive species and discussed ideas for restoration of native nectar-bearing species.

The Trustees allocated \$100,550 towards the purple loosestrife project component in 2013. All of these funds were utilized. Please refer to Exhibit D to see funds requested for 2014.

2014 Accomplishments:

Monitoring Purple Loosestrife:

Mass Audubon continued fall monitoring of purple loosestrife at sites that were established in the 2013 field season. Fall-season survey work was focused on establishing the efficacy of the biocontrol treatment on purple loosestrife and monitoring the long-term change in purple loosestrife density. Monitoring entailed following the Cornell University Protocol to survey 1-meter square plots for damage to leaves and flowers of purple loosestrife. Overall percent cover and stem counts of purple loosestrife at the recommended release sites was documented and will

be compared to results in the fall 2015 to determine if the released *Galerucella* beetle populations have established themselves and affecting the purple loosestrife infestations.

Rearing and Releasing Beetles for Biocontrol of Purple Loosestrife:

The CISMA Coordinator reared beetles at the demonstration site as well as assisted the partners in their independent rearing operations in 2014. Altogether, 10 shares of beetles were reared by 6 different CISMA member organizations which totaled approximately 375,000 beetles. Various factors which negatively affected the project was CISMA member partners unable to complete rearing their full share, Mass Audubon under the guidance of the Coordinator, was able to rear extra shares to make sure our goal was met for the number of beetles reared but we reared 1 share less than originally hoped.

The Coordinator continued to work with the bee keeping community and communicated the progress of the project. Conservation organizations were identified in 2 mile radius surrounding the sites where beetles were released. Any future mitigation efforts would be made within these identified areas for wet meadow restoration.

The Trustees allocated \$178,000 towards the purple loosestrife project component in 2014. Of the allocated funds, \$34,670 were not utilized. Of the funds unutilized, \$7,000 of the beetle rearing funds were unspent due to the CISMA rearing 9 partner shares instead of 10 and no beetle purchases were made in 2014 resulting in an additional \$27,670 in funds unspent. Please refer to Exhibit E to see how we proposed to re-distribute these funds for 2015.

2015 Accomplishments:

Rearing and Releasing Beetles for Biocontrol of Purple Loosestrife:

The CISMA Coordinator reared beetles at the demonstration site as well as assisted the partners in their independent rearing operations in 2015. Altogether, 16 shares of beetles were reared by 7 different CISMA member organization which totaled approximately 562,000 beetles.

The Trustees allocated \$115,000 towards the purple loosestrife project component in 2015 all of these funds were utilized. No beetles will be reared in 2016.

2016 Accomplishments:

Monitoring for Purple Loosestrife:

Mass Audubon continued fall monitoring of purple loosestrife at sites that were established in the 2013 field season. Fall-season survey work was focused on establishing the efficacy of the biocontrol treatment on purple loosestrife and monitoring the long-term change in purple loosestrife density. Monitoring entailed following the Cornell University Protocol to survey 1-meter square plots for damage to leaves and flowers of purple loosestrife. Overall percent cover and stem counts of purple loosestrife at the recommended release sites was documented and were compared to previous results. Although the number of loosestrife stems in our plots overall decreased across our release site the data were not statistically significant after the monitoring period of four years. This was not surprising as literature site a longer term monitoring period is

needed to determine efficacy for this type of project. By this projects end 975,000 beetles were reared and released in the watershed.

Wet Meadow Restoration:

To address possible negative economic impacts on the local beekeeping community due to rearing and releasing *Galerucella* beetles we restored approximately 20 acres of wet meadows on conservation properties that lie within a 2 mile radius from our identified beetle release sites. Since honeybees will forage for nectar and pollen within a 2 mile radius from their hive, we identified areas that overlap this radius for these restoration sites. These conservation lands were managed by four different CISMA members.

2. Water Chestnut

Goals:

The goals of this project were to enhance and maintain the ecological integrity of the Sudbury River and Heard Pond by virtually eradicating water chestnut (*Trapa natans*) in Heard Pond and reducing the existing populations along the Sudbury River to the point where control can be maintained by simple hand pulling.

The major components of this project were to:

- Map the extent of water chestnut in the Sudbury, Concord, Assabet Rivers and 130 acres of ponds in the Hop Brook watershed in 2013
- Purchase an aquatic weed harvester, canoes, kayaks, and transportation carts to facilitate water chestnut removal efforts
- Hire and oversee a crew of 10 interns for 8 weeks to conduct hand pulling of water chestnut
- Control water chestnut in the Sudbury River, Heard Pond, Fairhaven Bay, and Carding Mill Pond and Sterns Pond within the Hop Brook watershed in 2013, 2014, and 2015 by using mechanical harvesters and hand pulling efforts
- Monitor the control areas

2013 Accomplishments:

Mapping and Monitoring:

OARS (the watershed organization for the Assabet, Sudbury, and Concord Rivers) mapped distribution of invasive water chestnut in the Sudbury, Assabet, and Concord River system (including Heard Pond and four ponds of the Hop Brook system) to inform, support and, in the long-term, start to track the progress of remediation efforts. Data collection for water chestnut was completed between June 3rd and August 16th, 2013, using GIS-enabled GPS units to ensure that the information could be readily shared between invasive plant control projects and could be presented as a “snapshot” of the whole watershed for that season. A total of 2,133 acres of river area was surveyed from the headwaters of the Assabet and Sudbury Rivers in Westborough to the Centennial Island dam on the Concord River in Lowell. In the upper sections of both the Assabet River and the Sudbury River where boating was not possible, spot surveys were

conducted from road crossings where the rivers were visible; 164 acres of river area was not surveyed.

Water chestnut was found in sections of all three rivers throughout the system. Water Chestnut was found on the Assabet as far upstream as the impoundment above the Rte 85 dam in Hudson and on the Sudbury upstream to just below the dam between Framingham Reservoirs #2 and #1. On the downstream end, water chestnut was found along the edges of the Concord River to the downstream-most end of the survey section at the Centennial Island dam in Lowell. Maps showing the extent of the infestation are located on the SuAsCo CISMA website (http://cisma-suasco.org/maps/WC_survey).

In December 2013, the Coordinator will meet with the Town of Framingham, staff from the Department of Conservation and Recreation (DCR) Lakes and Ponds Program, staff from OARS, and staff from USFWS to discuss possible management options at the Saxonville Dam. The CISMA would like to propose the use of \$5,000 to support the management of this site since it is located upstream of current management efforts along the Sudbury River. The CISMA proposes these funds come out of the \$50,000 that was allocated towards management efforts on Heard Pond (Exhibit D).

Hiring of crew:

The USFWS sponsored a seven person Americorps crew from June 21st- July 9th. Since they were not able to be present for the entire harvesting season Mass Audubon also hired a 6 person crew with 1 team leader to supplement the rest of the time from July 15th- August 16th.

The crews took samples of water chestnut in each work area which were submitted to the Cornell Plant Analysis Lab. The results will be used to determine if harvested plant material can be safely used as compost in future harvest years.

Purchasing Equipment for Control Efforts:

The U.S. Fish and Wildlife (USFWS) has submitted a purchase proposal to their contracting office to purchase the new aquatic harvester. It will include a trailer, on-shore conveyor, barge, and trailer barge. USFWS has informed the harvester partnership of the progress of the purchase and has started drafting a Memorandum of Understanding (MOU) with the group to formalize how the equipment will be maintained and shared.

In addition USFWS may request to purchase canoes, kayaks, boat trailers, tie downs, and kayak paddles through their contracting office. They already purchased 30 life vests and 20 canoe paddles earlier in the season. The entire purchase was not made because the status of funds for the 10 person crew was not finalized until late in the season. We propose the remaining funds be removed from the 2013 USFWS allocation and be re-disbursed to Mass Audubon in 2014 to simplify the purchasing process.

The Trustees allocated \$468,450 towards the water chestnut project component in 2013. Some of these funds were utilized. Heard Pond utilized \$3,300 in 2013 of their available \$50,000 for the life of the grant. We anticipate utilizing the entire \$306,220 allocated for the purchase of the harvester. We anticipate having some savings from the \$35,000 that was allocated to purchase

canoes, kayaks and accessories but it is too early to project those costs. So far, \$2,016 of the canoe/kayak money has been spent in 2013. All of the \$18,230 that was allocated for mapping was utilized in 2013. Funds for the 10 person crew were allocated to both the USFWS and Mass Audubon to help cover the uncertainty of who was going to hire the crew. The USFWS utilized \$4,655 of the \$11,000 that was allocated, and Mass Audubon utilized \$14,120 of the \$48,000 that was allocated. Please refer to Exhibit D to see funds requested for 2014.

2014 Accomplishments:

Mapping and Monitoring:

The boatable sections of the river system were re-mapped in 2014 by OARS to confirm the findings of 2013 and to assess the variability of growth timing and locations. The distribution of water chestnut that was surveyed in 2014 was similar to what was found in 2013. There was an increase of about 45 acres of water chestnut between 2013 and 2014. New infestations were found upstream than had been observed in 2013: in the A1 Impoundment of the Assabet River and in the Sudbury Reservoir upstream of the Myrtle Street dam in Ashland. The population of water chestnut in the Hudson Impoundment of the Assabet River has spread from several isolated patches to many patches distributed throughout the impoundment. Also the population of water chestnut in Heard Pond, currently being managed by hand-pulling increased in 2014 despite being actively managed.

Staff from OARS, USFWS and the CISMA Coordinator started communicating with the town of Framingham to discuss various management options for the infestation that was identified at the Saxonville Dam. No funds have been utilized to date for that infestation but the Town of Framingham has officially become a CISMA member.

Hiring of Crew:

The coordinator applied for the AmeriCorps crew for the 2014 field season and received a crew for from July 11th - July 26th. A 10 person crew and crew leader were also hired for the entire water chestnut harvesting period from June 23rd- August 15th. This allowed the CISMA to have divided hand pulling efforts at numerous locations within the watershed simultaneously.

Purchasing Equipment for Control efforts:

The U.S. Fish and Wildlife Service completed the purchase of the harvester. The new equipment arrived in August 2014 and was able to operate for a short window along the Sudbury River that is managed by the USFWS. We estimate that 75 tons of water chestnut was removed using this newly purchased equipment.

Mass Audubon was able to finalize equipment purchases for hand pulling water chestnut. This equipment was used by the hired summer crew, the AmeriCorps crew and was loaned out to CISMA partners who needed equipment for conducting water chestnut removal work parties.

The Trustees allocated \$66,230 in new funds towards the water chestnut project component in 2014. Some of these funds were utilized. All of the \$18,230 allocated for mapping water chestnut was utilized but only \$33,296 of the \$48,000 allocated for the 10 person hand pulling crew was utilized resulting in \$14,704 available for use in 2015.

In addition to funds remaining from the 2014 allocation, there is still a balance of funds that were allocated in the 2013 distribution. Heard Pond utilized \$3,300 in 2013 and \$8,100 in 2014 of their available \$50,000 for the life of the grant. We have \$16,490 in savings from the \$35,000 that was allocated to purchase canoes, kayaks and accessories \$2,016 of the funds were spent in 2013 and \$16,494 were spent in 2014. There were leftover funds for the 10 person crew that was allocated to both the USFWS and Mass Audubon. This surplus of these funds from 2013 remains. The USFWS utilized \$4,655 of the \$11,000 that was allocated, and Mass Audubon utilized \$14,120 of the \$48,000 that was allocated. Please refer to Exhibit E to see how we proposed to re-distribute these funds for 2015.

2015 Accomplishments:

Mapping and Monitoring:

The Town of Framingham hired a consultant to conduct an assessment for the water chestnut infestation at Saxonville Dam. All work was conducted in 2015 and a final report was released. It will soon be available to view on our website.

Hiring of Crew:

The coordinator hired a 14 person crew for the entire water chestnut harvesting period from June 15th - August 7th. This allowed the crew to break up into smaller groups and assist multiple CISMA partners at the same time.

Hiring of Harvester Operator:

The CISMA hired an SCA intern through USFWS to help with the set up, maintenance, operation, and take down of the mechanical harvesters. This ensured that the USFWS had enough staff to harvest this field season.

Water Chestnut Management Plan for the watershed:

OARS started planning how to write a strategic plan to efficiently manage water chestnut on a watershed wide scale. In addition to background information on how water chestnut is currently managed state wide, they also held an Advisory Group meeting to discuss common problems people were encountering and how best to address those issues.

The Trustees allocated \$120,230 in funds towards the water chestnut project component in 2015. Some of these funds were utilized. In 2015 the CISMA spent \$6,500 towards management of water chestnut at Heard Pond, \$5,000 was spent at USFWS to purchase a storage facility for the newly purchased CISMA equipment. The CISMA spent \$56,264 on their water chestnut summer crew, \$4,375 was spent for the feasibility assessment conducted for the Town of Framingham for water chestnut management at Saxonville Dam, OARS spent \$6,897.46 towards their strategic

management plan for watershed wide water chestnut control, and \$10,000 was spent to hire a harvester operator. Please see Exhibit F to see how the CISMA proposes to spend remaining funds in 2016.

2016 Accomplishments:

Mapping and Monitoring:

The boatable sections of the river system were re-mapped in 2016 by OARS to assess the variability of growth timing and locations compared to 2013 and 2014. The mapping methodology was the same that was utilized in 2013.

Town of Wayland continued to control water chestnut at Heard Pond by hand pulling and using a mechanical harvester. The number of plants drastically increased during 2016 from previous years. This was thought to be due to rapid germination of the plants due to low water tables.

Water Chestnut Management Plan for the watershed:

OARS developed a guide to coordinate efforts to manage water chestnut within the SuAsCo watershed long term. Most of this effort focused on assisting towns get necessary permitting and resource materials for management on their property. This information was presented at the CISMA spring meeting and is posted on our website. We are hoping to develop a subcommittee specifically devoted to the effort of water chestnut management.

Exhibits

Exhibit A – Signatories & Supporting Partners (as of 1/2017)

Principle Partners – The following organizations are signatories to the Memorandum of Understanding establishing the SUASCO CISMA.

Carlisle Conservation Commission	OARS: Watershed organization for the Assabet
Carlisle Conservation Foundation	Sudbury & Concord Rivers
Chelmsford Conservation Commission	Southborough Open Land Foundation
Concord Land Conservation Trust	Stow Conservation Commission
Concord Natural Resources Commission	Stow Conservation Trust
Friends of the Assabet River NWR	SUASCO Watershed Community Council
Harvard Conservation Commission	SUASCO Wild & Scenic River Stewardship Council
Hop Brook Protection Association	Sudbury River Watershed Organization
Lincoln Conservation Commission	Sudbury Valley Trustees
Lincoln Land Conservation Trust	The Trustees of Reservations
Littleton Conservation Commission	The Walden Woods Project
Littleton Conservation Trust	Town of Framingham
Marlborough Conservation Commission	Town of Sudbury
Mass Audubon	U.S. Department of Agriculture- Natural Resources
Maynard Conservation Commission	Conservation Science
Middlesex Conservation District	U.S. Fish & Wildlife Service
Natick Garden Club	Wayland Conservation Commission
National Park Service	Wayland Surface Water Quality Committee
New England Forestry Foundation	Westborough Community Land Trust
New England Wild Flower Society	Westborough Conservation Commission
	Westford Conservation Trust

Supporting Partners – The following organizations are not signatories to the MOU but are supportive of and interested in participating in some capacity in the SUASCO CISMA.

Massachusetts Fish and Game- Division of
Ecological Restoration

Massachusetts Natural Heritage Endangered
Species Program

Town of Acton

Exhibit B
Sudbury Assabet Concord (SuAsCo)
Cooperative Invasive Species
Management Area

 CISMA bounds

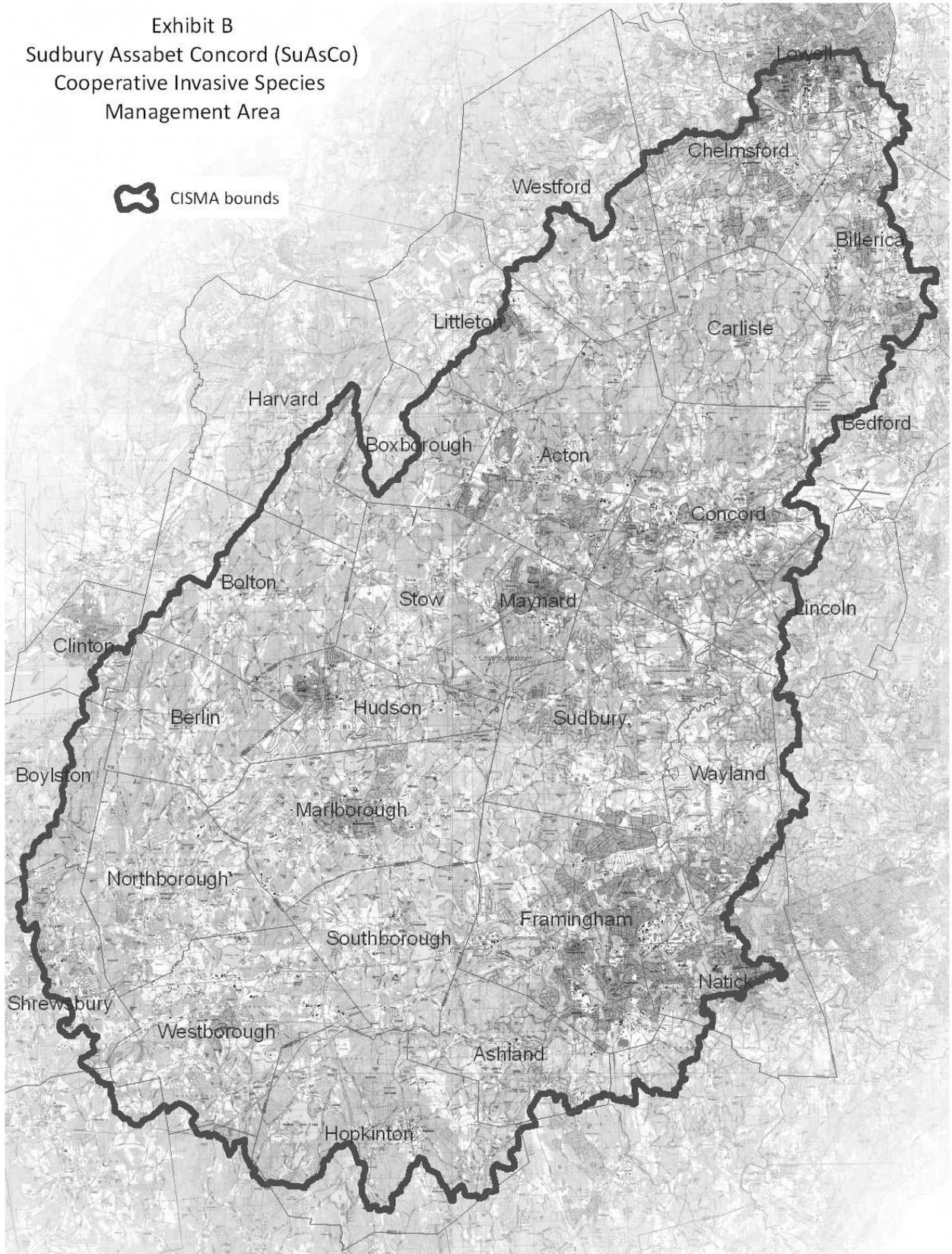


Exhibit C: 2013 Allocation of funds

					Total going to Mass Audubon				Total going to USFWS			
	2013	2014	2015	Total	2013	2014	2015	Total	2013	2014	2015	Total
Water Chestnut												
Heard Pond ¹	\$50,000.00			\$50,000.00	\$50,000.00			\$50,000.00				
Harvester ²	\$306,220.00			\$306,220.00					\$306,220.00			\$306,220.00
Kayaks/ Canoes/ Carts ³	\$35,000.00			\$35,000.00					\$35,000.00			\$35,000.00
Mapping ⁴	\$18,230.00	\$7,324.00	\$16,415.00	\$41,969.00	\$18,230.00	\$7,324.00	\$16,415.00	\$41,969.00				
10 person crew ⁵	\$59,000.00	\$48,000.00	\$48,000.00	\$144,000.00	\$48,000.00	\$48,000.00	\$48,000.00	\$144,000.00	\$11,000.00			
Water Chestnut Total	\$468,450.00	\$55,324.00	\$64,415.00	\$577,189.00	\$116,230.00	\$55,324.00	\$64,415.00	\$235,969.00	\$352,220.00			\$341,220.00
Purple Loosestrife												
Coordination ⁶	\$62,850.00	\$62,850.00	\$62,850.00	\$188,550.00	\$20,950.00	\$20,950.00	\$20,950.00	\$62,850.00	\$41,900.00	\$41,900.00	\$41,900.00	\$125,700.00
Mapping ⁷	\$19,700.00			\$19,700.00	\$19,700.00			\$19,700.00				
Monitoring ⁸	\$8,000.00	\$8,000.00	\$8,000.00	\$24,000.00	\$8,000.00	\$8,000.00	\$8,000.00	\$24,000.00				
Beetle rearing facility USFWS ⁹	\$10,000.00	\$10,000.00	\$10,000.00	\$30,000.00					\$10,000.00	\$10,000.00	\$10,000.00	\$30,000.00
CISMA partner rearing facilities ¹⁰		\$70,000.00	\$70,000.00	\$140,000.00		\$70,000.00	\$70,000.00	\$140,000.00				
Beetle purchase ¹¹		\$34,030.00	\$34,031.00	\$68,061.00		\$34,030.00	\$34,031.00	\$68,061.00				
Purple Loosestrife Total	\$100,550.00	\$184,880.00	\$184,881.00	\$470,331.00	\$48,650.00	\$132,980.00	\$132,981.00	\$314,611.00	\$51,900.00	\$51,900.00	\$51,900.00	\$155,700.00
GRAND TOTAL	\$569,000.00	\$240,204.00	\$249,296.00	\$1,047,500.00	\$164,880.00	\$188,304.00	\$197,396.00	\$550,580.00	\$404,120.00	\$51,900.00	\$51,900.00	\$496,920.00

¹ This amount of \$50,000 was allocated to Heard Pond by the Trustee's original budget and will be distributed to Wayland through the CISMA's fiscal agent, Mass Audubon, in 2013. We expect there to be surplus of funds from this allocation.

² This amount of \$306,220 is an increase from the original budget allocated by the Trustees for the amount of \$230,000. This increase in funds will be able to purchase an aquatic harvester, a transportation barge, a shore conveyer, a trailer, and any associated delivery fees. Since USFWS is going to own and house this equipment these funds will be distributed directly to USFWS in 2013.

³ This amount of \$35,000 is the combined total that was allocated to purchase canoes, kayaks, and carts by the Trustee's original budget. This money will purchase 10 canoes, 10 kayaks, 30 life vests, 30 paddles, 40 straps and a 10 boat trailer by USFWS in 2013. We expect there to be a surplus of funds from this allocation (Exhibit C-a).

⁴ This amount of \$18,230 for 2013; \$7,324 for 2014; and \$16,415 for 2015 or \$41,969 for the grant period is an increase from the original budget allocated by the Trustees for the amount of \$3,500. These funds will support mapping water chestnut each year. This increase in funds was determined by the budget that was submitted with winning project proposal by OARS. These funds will allow purchase of equipment and extensive mapping during 2013. In 2014 mapping will only take place in areas where there has been control of water chestnut. In 2015 extensive mapping will again be conducted. These funds will be distributed to OARS through the CISMA's fiscal agent, Mass Audubon, in the spring of 2013, 2014 and 2015.

⁵ This amount of \$48,000/year or \$144,000 for the grant period was allocated by the Trustee's original budget. The CISMA is currently exploring three options to hire the crew. The three options are: to hire a crew through Americorps, to hire the crew as interns through USFWS, or to hire the crew through another CISMA member with an hourly wage. The preference is to hire the crew through Americorps; however the availability of workers will not be known until March. To allow flexibility in hiring in 2013, funds will be distributed through the CISMA's fiscal agent, Mass Audubon, and directly to USFWS please note red amounts in 2013 and corresponding changes in totals. Surplus of funds from this allocation will be utilized to cover unanticipated cost overruns or to hire a crew in 2014 (Exhibit C-b). **The Trustees decided to also allocate an additional \$11,000 to USFWS to cover costs of the Americorps crew. The changes with these allocated funds are noted in red.**

⁶ This amount of \$62,850/year or \$188,550 for the grant period was an increase from the original budget allocated by the Trustees for the amount of \$20,000/year or \$60,000 for the grant period. We were told that the Trustees approved the cost of administration to be 10- 20% of the total grant. To calculate our number we took 18% of the entire grant and allocated 2/3 to go towards coordination and 1/3 to go towards tracking the grant's budget. The coordination funds will be distributed directly to USFWS and the budget tracking funds will be distributed to the SuAsCo CISMA's fiscal agent, Mass Audubon, in the spring of 2013, 2014 and 2015.

⁷ This amount of \$19,700 for 2013 was divided out of the \$175,000 lump sum the Trustees allocated for the purple loosestrife project component. These funds will support mapping of purple loosestrife and *Galerucella* beetle populations in the wetlands along the Sudbury River. This amount was determined by the budget that was submitted with the winning project proposal by Mass Audubon. These funds will be directly distributed to Mass Audubon in the spring of 2013.

⁸ This amount of \$8,000/year or \$24,000 for the grant period was divided out of the \$175,000 lump sum the Trustees allocated for the purple loosestrife project component. These funds will support monitoring *Galerucella* beetle populations in the wetlands along the Sudbury River where the beetles were released. The amount was determined by the budget that was submitted with the winning project proposal by Mass Audubon. These funds will be directly distributed to Mass Audubon in the spring of 2013, 2014, and 2015.

⁹ This amount of \$10,000/year or \$30,000 for the grant period was divided out of the \$175,000 lump sum the Trustees allocated for the purple loosestrife project component. These funds will support the creation and maintenance of a rearing facility to train and teach other CISMA members how to rear beetles. In 2014 and 2015 they will also help other rearing facilities with any issues they are experiencing. These funds were calculated based on the assumption that it will take about 500 hours to run a rearing facility to produce around 50,000 beetles. These funds will be directly distributed to USFWS during the spring of 2013, 2014 and 2015.

¹⁰ This amount of \$70,000 for 2014 and 2015 or \$140,000 for the grant period was divided out of the \$175,000 lump sum the Trustees allocated for the purple loosestrife project component. These funds will support the creation and maintenance of 10 rearing facilities established amongst the CISMA membership. These funds will cover all needed equipment costs and gives the participating partner a monetary compensation around \$10/hour. We hope this will be enough to hire interns and cover any training/ overhead costs for the CISMA member. This opportunity will go out for a bid as a request for proposals among the CISMA membership in the fall preceeding the funded field season. These funds will be distributed through the CISMA's fiscal agent, Mass Audubon, in the spring of 2014 and 2015.

¹¹ This amount of \$34,030 for 2014, and \$34,031 for 2015 or \$68,061 for the grant period was divided out of the \$175,000 lump sum the Trustees allocated for the purple loosestrife project component. These funds will support the purchase of *Galerucella* beetles to supplement the beetles that are being reared. Not as many funds are being allocated for this effort because the price of beetles ranges from year to year. The current price of beetles is \$360/1,000 including shipping costs. All CISMA members who were planning to release beetles that were purchased would also have to acquire a permit through USDA- APHIS. No permit is required for collecting, rearing and releasing beetles within the state of Massachusetts. No funds will go towards beetle purchase in 2013 because the appropriate release sites will not have been identified by Mass Audubon until the end of the 2013 field season. These funds will be distributed through the CISMA's fiscal agent, Mass Audubon, in the spring of 2014 and 2015.

Note: Any surplus of funds from 2013 will be utilized to cover unanticipated cost overruns or for project costs in 2014. A full accounting of costs will be provided to the Trustees prior to requesting funds for 2014

Exhibit D: 2014 Allocation of funds

					Total going to Mass Audubon				Total going to USFWS			
	2013	2014	2015	Total	2013	2014	2015	Total	2013	2014	2015	Total
Water Chestnut												
Heard Pond ¹	\$45,000.00			\$45,000.00	\$45,000.00			\$45,000.00				
Harvester ²	\$306,220.00			\$306,220.00					\$306,220.00			\$306,220.00
Kayaks/ Canoes/ Carts ³	\$35,000.00			\$35,000.00		\$32,984.00		\$32,984.00	\$2,016.00			\$2,016.00
Mapping ⁴	\$18,230.00	\$18,230.00	\$18,230.00	\$54,690.00	\$18,230.00	\$18,230.00	\$18,230.00	\$54,690.00				
10 person crew ⁵	\$59,000.00	\$48,000.00	\$37,000.00	\$144,000.00	\$48,000.00	\$48,000.00	\$37,000.00	\$133,000.00	\$11,000.00			\$11,000.00
Saxonville Dam ¹²		\$5,000.00		\$5,000.00	\$5,000.00			\$5,000.00				
Water Chestnut Total	\$463,450.00	\$71,230.00	\$55,230.00	\$589,910.00	\$116,230.00	\$99,214.00	\$55,230.00	\$270,674.00	\$319,236.00			\$319,236.00
Purple Loosestrife												
Coordination ⁶	\$62,850.00	\$62,850.00	\$62,850.00	\$188,550.00	\$20,950.00	\$62,850.00	\$62,850.00	\$146,650.00	\$41,900.00			\$41,900.00
Mapping ⁷	\$19,700.00			\$19,700.00	\$19,700.00			\$19,700.00				
Monitoring ⁸	\$8,000.00	\$8,000.00	\$8,000.00	\$24,000.00	\$8,000.00	\$8,000.00	\$8,000.00	\$24,000.00				
Beetle rearing facility USFWS ⁹	\$10,000.00	\$10,000.00	\$10,000.00	\$30,000.00		\$10,000.00	\$10,000.00	\$20,000.00	\$10,000.00			\$10,000.00
CISMA partner rearing facilities ¹⁰		\$70,000.00	\$70,000.00	\$140,000.00		\$70,000.00	\$70,000.00	\$140,000.00				
Beetle purchase ¹¹		\$27,670.00	\$27,670.00	\$55,340.00		\$27,670.00	\$27,670.00	\$55,340.00				
Purple Loosestrife Total	\$100,550.00	\$178,520.00	\$178,520.00	\$457,590.00	\$48,650.00	\$178,520.00	\$178,520.00	\$405,690.00	\$51,900.00			\$51,900.00
GRAND TOTAL	\$564,000.00	\$249,750.00	\$233,750.00	\$1,047,500.00	\$164,880.00	\$277,734.00	\$233,750.00	\$676,364.00	\$371,136.00			\$371,136.00

¹ This amount of \$50,000 was allocated to Heard Pond by the Trustee's original budget and will be distributed to Wayland through the CISMA's fiscal agent, Mass Audubon, in 2013. We expect there to be surplus of funds from this allocation. A total of \$3,300 was utilized in 2013 the remaining funds will sit at Mass Audubon and remain available for management at Heard Pond.¹² We propose \$5,000 of these expected remaining funds be allocated for water chestnut management at the Saxonville Dam. This site is densely infested and is upstream of all current management efforts.

² This amount of \$306,220 is an increase from the original budget allocated by the Trustees for the amount of \$230,000. This increase in funds will be able to purchase an aquatic harvester, a transportation barge, a shore conveyer, a trailer, and any associated delivery fees. Since USFWS is going to own and house this equipment these funds will be distributed directly to USFWS in 2013. We expect this purchase to successfully go through USFWS contracting and be available for the 2014 field season.

³ This amount of \$35,000 is the combined total that was allocated to purchase canoes, kayaks, and carts by the Trustee's original budget. This money will purchase 10 canoes, 10 kayaks, 30 life vests, 30 paddles, 40 straps and a 10 boat trailer by USFWS in 2013. We expect this purchase to successfully go through USFWS contracting and be available for the 2014 field season. We are unsure if there will be a surplus of funds from this allocation. In 2013 USFWS spent \$2,016 of these funds. Due to issues with USFWS contracting we propose the remainder of these funds be removed from USFWS' allocation and re-disbursed to Mass Audubon in 2014.

⁴ This amount of \$18,230 for each field season or \$54,690 for the grant period is an increase from the original budget allocated by the Trustees for the amount of \$3,500. These funds will support mapping water chestnut each year. Mapping the chestnut each year was deemed significantly important because there are a lot of environmental variations that can occur every year. This three year time period of extensive mapping should give us a clear picture of the true extent of our infestations.

⁵ This amount of \$48,000/year or \$144,000 for the grant period was allocated by the Trustee's original budget. The Trustees decided to also allocate an additional \$11,000 to USFWS to cover costs of the Americorps crew. In 2014 we plan to pursue another Americorps crew but also hire a 10 person crew for the full harvesting time frame. Any costs associated with the Americorps crew will be covered from the remaining balance of the \$11,000 allocated to USFWS. The balance of \$6345 will go towards any associated costs USFWS incurs by being a host to the Americorps crew. The new disbursement of \$48,000 to Mass Audubon will go towards hiring a 10 person crew for the full 8 week time period. The remainder of \$33,880 from 2013's disbursement will also be available for a total of \$81,880. Any unused funds will go towards 2015 costs.

⁶ This amount of \$62,850/year or \$188,550 for the grant period was an increase from the original budget allocated by the Trustees for the amount of \$20,000/year or \$60,000 for the grant period. We were told that the Trustees approved the cost of administration to be 10- 20% of the total grant. To calculate our number we took 18% of the entire grant and allocated 2/3 to go towards coordination and 1/3 to go towards tracking the grant's budget. The coordination funds and the budget tracking funds will be distributed to the SuAsCo CISMA's fiscal agent, Mass Audubon, in the spring of 2014 and 2015. In 2013 the coordinator's funds were disbursed to USFWS but the coordinator's position will be housed at Mass Audubon for 2014 and 2015.

⁸ This amount of \$8,000/year or \$24,000 for the grant period was divided out of the \$175,000 lump sum the Trustees allocated for the purple loosestrife project component. These funds will support monitoring *Galerucella* beetle populations in the wetlands along the Sudbury River where the beetles were released. The amount was determined by the budget that was submitted with the winning project proposal by Mass Audubon. These funds will be directly distributed to Mass Audubon in the spring of 2013, 2014, and 2015.

⁹ This amount of \$10,000/year or \$30,000 for the grant period was divided out of the \$175,000 lump sum the Trustees allocated for the purple loosestrife project component. These funds will support the creation and maintenance of a rearing facility to train and teach other CISMA members how to rear beetles. In 2014 and 2015 they will also help other rearing facilities with any issues they are experiencing. These funds were calculated based on the assumption that it will take about 500 hours to run a rearing facility to produce around 50,000 beetles. These funds will be directly distributed to Mass Audubon during the spring of 2014 and 2015.

¹⁰ This amount of \$70,000 for 2014 and 2015 or \$140,000 for the grant period was divided out of the \$175,000 lump sum the Trustees allocated for the purple loosestrife project component. These funds will support the creation and maintenance of 10 rearing facilities established amongst the CISMA membership. These funds will cover all needed equipment costs and gives the participating partner a monetary compensation around \$10/hour. We hope this will be enough to hire interns and cover any training/ overhead costs for the CISMA member. This opportunity will go out for a bid as a request for proposals among the CISMA membership in the fall proceeding the funded field season. These funds will be distributed through the CISMA's fiscal agent, Mass Audubon, in the spring of 2014 and 2015.

¹¹ This amount of \$27,670 for 2014 and 2015 or \$55,340 for the grant period was divided out of the \$175,000 lump sum the Trustees allocated for the purple loosestrife project component. These funds will support the purchase of *Galerucella* beetles to supplement the beetles that are being reared. Not as many funds are being allocated for this effort because the price of beetles ranges from year to year. The current price of beetles is \$360/1,000 including shipping costs. All CISMA members who were planning to release beetles that were purchased would also have to acquire a permit through USDA-APHIS. No permit is required for collecting, rearing and releasing beetles within the state of Massachusetts. It is unclear if you are still allowed to purchase beetles out of state and import them into Massachusetts. If this is no longer allowed the CISMA will rely solely on the beetles reared at the numerous rearing facilities in the watershed and these funds will be reallocated towards other project components.

Note: Any surplus of funds from 2014 will be utilized to cover unanticipated cost overruns or for project costs in 2015. A full accounting of costs will be provided to the Trustees prior to requesting funds for 2014.

Exhibit E: 2015 Allocation of funds

	2015		2016		Total going to Mass Audubon 2015		Total going to USFWS 2015	
	new allocation	re-distribution	new allocation	re-distribution	new allocation	re-distribution	new allocation	re-distribution
Water Chestnut								
Heard Pond ¹		\$15,000.00		\$10,000.00		\$15,000.00		
Harvester ²								
Kayaks/ Canoes/ Carts ³		\$5,000.00						\$5,000.00
Mapping ⁴			\$18,230.00					
10 person crew ⁵	\$37,000.00	\$23,000.00			\$37,000.00	\$23,000.00		
Saxonville Dam ¹²		\$5,000.00				\$5,000.00		
OARS Coordination Report ¹³		\$25,000.00				\$25,000.00		
Harvester Operator ¹⁴	\$8,655.00	\$1,345.00					\$8,655.00	\$1,345.00
Water Chestnut Total	\$45,655.00	\$74,345.00	\$18,230.00	\$10,000.00	\$37,000.00	\$68,000.00	\$8,655.00	\$6,345.00
Purple Loosestrife								
Coordination ⁶	\$48,343.00		\$14,507.00		\$48,343.00			
Mapping ⁷								
Monitoring ⁸			\$8,000.00					
Beetle rearing facility USFWS ⁹	\$10,000.00				\$10,000.00			
CISMA partner rearing facilities ¹⁰	\$89,015.00	\$15,985.00			\$89,015.00	\$15,985.00		
Beetle purchase ¹¹								
Wet meadow restoration ¹⁵				\$44,359.00				
Purple Loosestrife Total	\$147,358.00	\$15,985.00	\$22,507.00	\$44,359.00	\$147,358.00	\$15,985.00		
GRAND TOTAL	\$193,013.00	\$90,330.00	\$40,737.00	\$54,359.00	\$184,358.00	\$83,985.00	\$8,655.00	\$6,345.00

¹ In 2013 and 2014 \$11,400 was spent out of the \$45,000 that was allocated in 2013. There is \$33,600 remaining for this project. We proposed \$15,000 be allocated for 2015 and \$10,000 be allocated for 2016 and the remaining funds be re-distributed to other CISMA projects.

² This amount of \$306,220 is an increase from the original budget allocated by the Trustees for the amount of \$230,000. This increase in funds will be able to purchase an aquatic harvester, a transportation barge, a shore conveyer, a trailer, and any associated delivery fees. Since USFWS is going to own and house this equipment these funds will be distributed directly to USFWS in 2013. This purchase was successfully completed and no funds are available for re-distribution.

³ This amount of \$35,000 is the combined total that was allocated to purchase canoes, kayaks, and carts by the Trustee's original budget. This money will purchase 10 canoes, 10 kayaks, 30 life vests, 30 paddles, 40 straps and a 10 boat trailer by USFWS in 2013. In 2013 USFWS spent \$2,016 of these funds. The remaining purchases for this project totaling \$16,494 were completed by Mass Audubon in 2014. There is \$16,490 available in unspent funds available for re-distribution. We proposed \$5,000 be allocated to USFWS to help fund a storage location for this purchased equipment and make the other \$11,490 available for other CISMA projects. Please note USFWS has a remaining balance of \$6,345 in their Nyanza fund that was allocated in 2013. Any funds allocated to USFWS in 2015 should subtract this amount from their total allocation.

⁴ In 2013 and 2014 \$18,230 was allocated for mapping water chestnut watershed wide for a total of \$36,460 in allocated funds. All these funds were spent and we would like to request an additional \$18,230 to be allocated for 2016.

⁵ In 2013 \$59,000 was allocated between Mass Audubon and USFWS. In 2014 an additional \$48,000 was allocated to Mass Audubon. Out of these funds \$54,929 remains unused. We plan to hire a 14 person crew in 2015 with an expected budget cost of \$60,000. To keep matters relatively simple, we request \$37,000 in new funds towards hiring a summer crew, and \$23,000 of unused funds to be re-allocated to cover the remaining costs. The other unused funds will be made available for re-distribution to other CISMA projects. Please note the USFWS has a remaining balance of \$6,345 from their \$11,000 allocation in 2013. Any funds given to USFWS in 2015 should subtract this amount from their total allocation.

⁶ In 2013 and 2014 \$62,850 was allocated towards coordination of the grant. All funds have been spent and we request an additional \$48,343 for coordination during 2015 and \$14,507 for coordination during 2016.

⁷ In 2013 \$19,700 was allocated towards mapping purple loosestrife along the Sudbury River. All these funds have been spent. No further funds are requested.

⁸ In 2013 and 2014 \$8,000 was allocated per year to monitor purple loosestrife infestation and *Galerucella* beetle populations in the wetlands along the Sudbury River where the beetles were released. All funds have been spent. We request an additional \$8,000 to continue these monitoring efforts in 2016.

⁹ Allocations totaling \$20,000 were disbursed in 2013 and 2014. All of these funds were spent. We request an additional \$10,000 in 2015 to support the creation and maintenance of a rearing facility to train and teach other CISMA members how to rear beetles.

¹⁰ This amount of \$70,000 for 2014 supported CISMA partners to rear beetles. Only \$63,000 was spent since with \$7,000 available for re-distribution. We propose increasing the number of shares reared to 15 in the 2015 field season. CISMA members have already signed up for these shares and many reared in 2014, so we expect all requested funds to be utilized. Our estimated budget for beetle rearing in 2015 is \$105,000 we request \$89,015 to come from newly allocated funds and for \$15,985 to be re-distributed to the project in 2015.

¹¹ No CISMA wide beetle purchases took place or are planned to take place during the period of this grant. They were initially budgeted as a back up plan in case beetle rearing was unsuccessful. We proposed the full amount of \$54,359 be re-distributed to other CISMA projects in 2015 and 2016.

¹² We proposed \$5,000 of the original allocation of \$50,000 for management at Heard Pond be made available for water chestnut management at the Saxonville Dam in 2014. These funds have not been spent and we propose keeping them available for use until December 2015.

¹³ In late 2014, OARS submitted a project proposal to the Trustees to coordinate water chestnut management. Their anticipated budget is \$25,000 and would be allocated from re-distributed funds.

¹⁴ Due to issues with staff availability at USFWS and the hopeful retirement of the harvester operator at Hop Brook Association we propose hiring a harvester operator for 12 weeks to help set up, operate, maintain, and put away harvesting equipment for 2015. The CISMA is unsure which partner will hire this position but avenues of hiring through the Student Conservation Association or contracting through a CISMA partner are being considered. We request \$10,000 be allocated to hire this position from re-distributed funds. The coordinator will remain in contact with the Trustees on the development of this position. Funds will be allocated to USFWS.

¹⁵ We anticipate some negative impacts on the beekeeping community when reducing the purple loosestrife infestation along the Sudbury River by the CISMA releasing *Galerucella* beetles. We propose allocating \$44,359 in re-distributed funds to restore wet meadows in 2016. The project sites will be determined by an internal bidding process within the CISMA. Eligible project sites will be located within a 2 mile radius of beetle release sites. Other factors such as invasive plants present, site size, project feasibility, and total funds awards from the Trustees towards this project will be taken into account. If USFWS receives funds towards this project the Coordinator will work with the Trustees to reallocate funds from Mass Audubon back into the Trustees' Nyanza account to be disbursed to USFWS.

Exhibit F: 2016 Allocation of funds

	\$1,047,500.00				Project Total
	2013	Spent		2016	
	2014	2015			
Water Chestnut					
Heard Pond 1	3,300.00	8,100.00	6,500.00	14,500.00	32,400.00
Harvester 2	306,220.00	-	-	-	306,220.00
Kayaks/Canoes/Carts 3	2,016.00	16,784.00	5,000.00	-	23,800.00
Mapping 4	18,230.00	18,230.00	-	15,230.00	51,690.00
10 Person Crew 5	18,775.00	41,837.00	56,264.00	-	116,876.00
Saxonville Dam 12	-	-	4,375.00	-	4,375.00
OARS Coordination Report 13	-	-	6,897.46	18,102.54	25,000.00
Harvester Operator 14	-	-	10,000.00	-	10,000.00
Water Chestnut Total	348,541.00	84,951.00	89,036.46	47,832.54	570,361.00
					-
Purple Loosestrife					-
Coordination 6	62,850.00	62,850.00	48,343.00	14,507.00	188,550.00
Mapping 7	19,700.00	-	-	-	19,700.00
Monitoring 8	8,000.00	8,000.00	-	8,000.00	24,000.00
Beetle rearing facility USFWS 9	10,000.00	10,000.00	10,000.00	-	30,000.00
CISMA partner rearing facilities 10	-	63,000.00	105,000.00	-	168,000.00
Beetle purchase 11	-	-	-	-	-
Wet meadow restoration 15	-	-	-	46,889.00	46,889.00
Purple Loosestrife Total	100,550.00	143,850.00	163,343.00	69,396.00	477,139.00
					-
GRAND TOTAL	449,091.00	228,801.00	252,379.46	117,228.54	1,047,500.00

¹From 2013 through 2016 \$32,400 was spent a reduction of the original \$50,000 approved in 2013.

²From 2013 through 2016 \$306,220 was spent to purchase a harvester, barge, conveyor and trailers. This is the same amount as was approved by the Trustees in 2013.

³From 2013 through 2016 \$23,800 was spent on equipment. This is a reduction in the original budget of \$35,000 approved by the Trustees in 2013.

⁴From 2013 through 2016 \$51,690 was spent on mapping water chestnut infestations throughout the SuAsCo watershed. This total budget was an increase from the \$41,969 that was approved by the Trustees in 2013. The results from the mapping were incorporated into the water chestnut strategic management plan for the watershed.

⁵From 2013 through 2016 \$116,876 went towards hiring seasonal crew to manually pull water chestnut alongside the mechanical harvesters. This is less than the budget of \$144,000 which was approved by the Trustees in 2013.

⁶From 2013 and 2016 \$188,550 was spent towards Coordination for the grant. This is the same as the budget of \$188,550 which was approved by the Trustees in 2013.

⁷In 2013 \$19,700 was spent towards mapping purple loosestrife along the Sudbury River. All these funds have been spent. No further funds are requested and none will be available to the Trustees to use towards Tier 2 projects.

⁸From 2013 through 2016 \$24,000 was spent on monitoring purple loosestrife at beetle release sites. This is the same amount as the budget the Trustees approved in 2013.

⁹From 2013-2015 \$30,000 was spent on a beetle rearing demonstration site. This is the same amount as was approved by the Trustees in 2013.

¹⁰From 2013-2015 the CISMA spent \$168,000 on CISMA partner beetle rearing facilities. This is an increase in the budget of \$140,000 which was approved by the Trustees in 2013

¹¹No CISMA wide beetle purchases took place during the period of this grant

¹² In 2015 \$4,375 of funds were spent on water chestnut management in Framingham at the Saxonville Dam. This is a decrease from the proposed \$5,230 award in 2014.

¹³ In late 2014, OARS submitted a project proposal to the Trustees to coordinate water chestnut strategic management plan for the watershed. The CISMA spent \$25,000 towards the project.

¹⁴In 2015 the CISMA requested \$10,000 be made available to hire a harvester operator to help USFWS with staffing issues. The Operator was hired and all funds were used.

¹⁵We anticipate some negative impacts on the beekeeping community when reducing the purple loosestrife infestation along the Sudbury River by the CISMA releasing *Galerucella* beetles. We spent \$46,889 on restoring approximately 20 acres within the watershed.