

**2010-2012 Action Plan**  
*includes 2009-2010 progress report*

**Ashokan Watershed Stream Management Program**

## **Ashokan Watershed Stream Management Program's Goals**

General watershed-level goals are developed in the stream management planning process to further the overall program goal of restoring stream system stability and ecologic integrity while sustaining viable communities in the Catskill watersheds. The goals are formed around the basic categories of issues associated with managing streams:

- Inform stakeholders on water quality issues in the Ashokan Reservoir and advocate for improving and protecting water quality
- Work to have a coordinated and consistent approach to stream management activities that optimizes available resources and information
- Reduce flooding and erosion hazards while improving stream system (overall channel and floodplain) stability in the Ashokan Reservoir watershed.
- Inform stakeholders on the status of aquatic and riparian (streamside) ecosystem condition and advocate for improving and protecting the condition of the ecologic integrity of the stream corridors in the Ashokan Reservoir watershed.
- Inform stakeholders on the status of recreation and other public uses of the streams within the Ashokan Reservoir watershed and advocate for a viable recreation based local economy that respects the overall goal.
- Develop and implement an intentional education and outreach program that addresses and informs the successful achievement of the above goals.

## **Program Components**

1. Watershed Assessment and Monitoring
2. Riparian Corridor Improvement
3. Municipal Coordination and Assistance
4. Reach-level Stream Plans and Projects
5. Training and Technical Assistance for Resource Managers, and Streamside Landowners
6. Community Engagement and Communication

The recommendations in the Action Plan have been compiled from the three completed stream management plans (Broadstreet Hollow, Stony Clove, Esopus Creek). They were selected through an iterative process with feedback from stakeholder groups and the program Advisory Council. The action items are the planned activities to address the recommendations. To the extent possible, they reflect program priorities and staff and funding resources.

## 1. Watershed Assessment and Monitoring

*Data collection, monitoring, and analysis to help guide policy, projects and programs in the Ashokan Watershed related to stream, riparian corridor and floodplain management.*

*The Assessment is comprised of:*

- Stream Corridor Assessments*
- Monitoring of Stream Projects*
- Floodplain Assessment*
- Stormwater Management Planning*
- Large Woody Debris Assessment*
- Riparian and Aquatic Ecosystem Assessment*
- Economic and Community Impact Assessment*

### Stream Corridor Assessments

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**Recommendation 1: Support continued stream feature inventories (SFI) in the tributary streams to the Esopus that have not been previously assessed. The SFI's are used to help diagnose stream corridor condition and to help identify stream erosion hazards that may require some treatment.**

**Action Item 1.1** The Project Team will complete Phase 1-3 assessments for two streams during the two year planning period (2009 – 2011).

- a. Lead Agency: UC SWCD
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan:
  - i. Assessment and brief report (with maps) documenting Phase 1 results and Phase 2 recommendations for each assessed stream. Assessment and brief report (with maps and photos) documenting Phase 2 results and Phase 3 recommendations for each assessed stream. Assessment and brief annual reports documenting Phase 3 results and recommendations for select sites at each assessed stream reach. Minimum effort will be to establish a Rosgen Level III reach assessment and monitoring program for the Ashokan watershed with the initial assessment of at least three reaches per assessed stream.
    - a. Accomplishments (2009-2010)
      - Beaver Kill Assessment, phase1,2 = 50% complete
      - Priority streams for assessments identified
      - 2010 field plan (including intern hiring and support) organized and planned for assessment work on at least two tributaries
    - b. Work plan (2010-2012)
      - Complete Beaver Kill assessment Winter 2010
      - Complete Birch Creek assessment spring 2011
      - Complete Bush Kill assessment Winter 2012
      - Complete 4<sup>th</sup> stream assessment spring 2012
  - ii. Geodatabase and associated ArcGIS files are developed.

- a. Accomplishments (2009-2010)
  - Database constructed and is being utilized
- b. Work plan (2010-2012)
  - Continue to develop geodatabase for assessed streams
- iii. Survey data in RiverMorph and/or AutoCAD files (for Phase 3)
  - a. Accomplishments (2009-2010)
    - None, Phase 3 assessments not underway yet
  - b. Work plan (2010-2012)
    - To be implemented in conjunction with stream assessment plans above

**Recommendation 2: Support further riparian corridor assessment for the tributaries to Upper Esopus Creek not previously investigated. See Appendix A for more information.**

**Action Item 2.1** Complete riparian corridor assessments for the streams to be assessed in Action Item 1 using the program-established protocol.

- a. Lead Agency: UC SWCD
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
  - i. Assessment and documentation
    - a. Accomplishments (2009-2010)
      - None, assessments not underway yet due lack of imagery availability
    - b. Work plan (2010-2012)
      - To be completed by fall 2010

**Recommendation 3: Support an investigation of the geotechnical processes controlling coupled hill slope and stream bank erosion in order to evaluate management feasibility. These erosion sites are typically long-lasting and chronic sources of turbidity to Esopus watershed streams.**

**Action Item 3.1** UC SWCD and DEP intend to initiate a geomorphic and geotechnical assessment of the “Chichester reach” of Stony Clove Creek (Management Units 17 and 18 in the SCSMP) in support of a proposed treatment feasibility study. This reach of stream is characterized by chronic suspended sediment loading from coupled streambank erosion and hill slope failures.

- a. Lead Agency: UC SWCD
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan:
  - i. Work with other partners through inter-governmental agreement to investigate geotechnical and hydrogeologic conditions leading to hill slope failure at the Chichester reach of Stony Clove.
    - a. Accomplishments (2009-2010)
      - UC SWCD Commissioned Initial investigation by Malone and McBroome
    - b. Work plan (2010-2012)
      - Engineering assessment of Warner Creek turbidity sites to be completed by fall2010, design by Winter 2010/11, installation

as required to reduce erosion and turbidity entrainment fall 2011

- ii. Seek to engage researchers to conduct research in the Esopus Creek watershed to investigate this phenomenon.
  - a. Accomplishments (2009-2010)
    - DEP/CCE Collaboration with NYSGS (See recommendation 4)
    - DEP Collaboration with SUNY New Paltz REU
  - b. Work plan (2010-2012)
    - See recommendation 4
    - DEP Collaboration with SUNY New Paltz REU

**Recommendation 4: Support glacial geology mapping in the Upper Esopus Watershed to improve turbidity source characterization.**

**Action Item 4.1** DEP intends to support the NYS Geological Survey to update/revise the mapping of the surficial geology of the Upper Esopus Creek watershed. The results of this mapping can be used to help (1) improve our understanding of where potential stream channel and hill slope sources of suspended sediment are likely to occur; and (2) aid in development of spatially distributed models of suspended sediment entrainment and transport in the stream network. *This Action Item is contingent upon availability of federal funding.*

- a. Lead Agency: DEP, NYS Geological Survey, CCE
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan:
  - i. Meet with NYSGS staff seasonally to stay apprised as to their efforts and provide additional data as available.
    - a. Accomplishments (2009-2010)
      - Dan Davis has met on several occasions with NYSGS staff in the office and in the field.
      - Liz Higgins of CCE has corresponded with NYSGS staff about the status of the project.
    - b. Work plan (2010-2012)
      - Davis and Higgins will continue to collaborate with NYSGS staff (see item ii)
  - ii. Assist NYSGS, if possible with supplemental funding to support effort.
    - a. Accomplishments (2009-2010)
      - DEP and NYSGS were not able to enter into a contractual arrangement because of institutional barriers.
      - NYSGS submitted proposal to CCE for AWSMP Implementation Program Matching Funds. Request was approved for funding by Advisory Council (4/10)
      - Contract between CCE and NYSGS for this work is in process
    - b. Work plan (2010-2012)
      - Complete contract
      - Initiate grant-funded project

## Monitoring of Stream Projects

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### Recommendation 5: Annually monitor performance of stream corridor projects funded by the Ashokan Watershed Stream Management Program.

**Action Item 5.1** Develop a stream corridor project monitoring protocol that can be adapted for specific projects.

- a. Lead Agency: UC SWCD
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan:
  - i. Review regionally and nationally available monitoring protocols and develop program-specific protocol that has adaptive format/content to accommodate the specific types of projects and unique goals/objectives.
    - a. Accomplishments (2009-2010)
      - Reviewed habitat documentation
    - b. Work plan (2010-2012)
      - UCSWCD to hire a consultant to do this planned activity

**Action Item 5.2** Implement monitoring protocol with the completion of the first project completed with funds from AWSMP contracts.

- a. Lead Agency: UC SWCD
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan:
  - i. Above Possible Activity, if project constructed within the two-year action planning period
    - a. Accomplishments (2009-2010)
      - Limited – protocol and project not completed.
    - b. Work plan (2010-2012)
      - Implement protocols and evaluate pre-build at project sites

### Recommendation 6: Assess the impacts of restoration projects on aquatic ecosystems and riparian habitats.

**Action Item 6.1** Evaluate ecological impacts associated with restoration projects.

- a. Lead Agency: Multiple
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan:
  - i. Coordinate existing monitoring and research programs with proposed stream restoration sites to the extent possible.
    - a. Accomplishments (2009-2010)
      - DEP/CCE is collaborating with USGS/DEC water quality grant to include sites in Stony Clove near proposed “Chichester Reach” restoration project.
    - b. Work plan (2010-2012)
      - USGS/DEC to collect data for the project summer 2010. Funding provided by CCE AWSMP Matching Grant. This includes public dissemination of results.

## Floodplain Assessment

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### Recommendation 7: Support the completion of Flood Studies by FEMA to produce necessary revisions to the existing Flood Insurance Rate Maps (FIRMs)

- Action Item 7.1** Update topographic data necessary to improve accuracy of terrain for hydraulic modeling required to delineate floodplains.
- a. Lead Agency: DEP, FEMA
  - b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan:
    - i. DEP has procured recent LIDAR topographic data (April, 2009) necessary for FIRM development. DEP and contractors will update digital elevation models based on LIDAR data. Updated digital elevation models will be used for hydraulic modeling and subsequent hydraulic modeling results to be used in deriving FIRMs. Timing is contingent upon pending DEP-FEMA contract registration.
      - a. Accomplishments (2009-2010)
        - DEP/FEMA Contract Registered and project underway
      - b. Work plan (2010-2012)
        - Complete LIDAR project

- Action Item 7.2** Revise FIRMs for Ashokan Reservoir watershed via an Agreement between DEP and FEMA.
- a. Lead Agency: FEMA
  - b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan:
    - i. FEMA will revise FIRMs based on updated terrain and modeling information and will provide to municipalities for review/comment (contingent upon pending DEP-FEMA contract registration)
      - a. Accomplishments (2009-2010)
        - DEP/FEMA Contract registered
        - NYS DEC/DEP and CCE sponsored an initial meeting with towns (4/10) to identify priority areas for detailed FIRM mapping
      - b. Work plan (2010-2012)
        - Maps will be completed by FEMA
        - CCE will participate in mapping committee

## Stormwater Management Planning

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### Recommendation 8: Culvert outfalls create point sources of discharge, collected from the diffuse sources of road runoff. These outfalls can discharge significant amounts of concentrated pollutants into the stream. Identify the most critical outfalls with regard to point-source discharges and substrate stability, and which offer opportunities for mitigation.

**Action Item 8.1** Town of Shandaken has mapped with GPS, the locations of all culvert outfalls. Work with the Town to identify those culvert outfalls that may contribute pollutants into the stream system and prioritize opportunities for mitigation.

- a. Lead Agency: SWCD and CCE
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan:
  - i. Obtain copy of georeferenced information on culverts from Shandaken and UC DOE. Work with Town to add information relating to whether the culvert is a “critical” point-source discharge of pollutants and identify treatment alternatives that can be used to mitigate the problem. Identify funding sources that can assist the Town (and other highway management agencies) in implementing recommended mitigation practices. Report documenting plan for (1) mitigating point-source pollutant discharges from culvert outfalls; and (2) identification of funding opportunities.
    - a. Accomplishments (2009-2010)
      - See 8.2.
    - b. Work plan (2010-2012)
      - See Action Item 8.2

**Action Item 8.2** Work with the other Ashokan watershed municipalities, County DPW and NYSDOT to map culvert outfalls and identify those culvert outfalls that may contribute pollutants into the stream system and prioritize opportunities for mitigation.

- a. Lead Agency: CCE
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan:
  - i. CCE to issue RFP to hire consultant to map culverts in Ashokan Watershed, Spring 2010.
    - a. Accomplishments (2009-2010)
      - Received report from Ulster County DOE on prior work done on mapping culverts in Ulster County
      - CCE and SWCD researched culvert assessment and monitoring protocol in other states
    - b. Work plan (2010-2012)
      - Obtain Shandaken data
      - Issue RFP and identify consultant to update existing data and complete assessment of culverts in the watershed.
      - Inform municipalities about results.

## **Large Woody Debris Assessment**

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**Recommendation 9: Advocate an active monitoring program for large woody debris (LWD) that focuses upon (1) the identification and removal of debris that poses a flood hazard to infrastructure and a threat to human welfare and (2) identifies LWD key to ecologic health.**

**Action Item 9.1** Develop and distribute to watershed municipalities maps of potential hazards associated with LWD based on aerial and ground-based reconnaissance imagery.

- a. Lead Agency: DEP
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan:
  - i. Review available aerial reconnaissance imagery to map out persistent and/or potentially hazardous LWD sites.



- a. Accomplishments (2009-2010)
  - SCA intern worked with SWCD to use aerial imagery to identify persistent LWD sites.
  - LWD Photomonitoring project initiated by SCA interns.
- b. Work plan (2010-2012)
  - Continue LWD photomonitoring project. Develop website for public on LWD based on photomonitoring.

**Action Item 9.2** CCE will research how other areas have handled LWD management issues.

- a. Lead Agency: CCE
- b. Planned Activity/Outcome(s):
  - i. Conduct nation-wide research into LWD management by agencies and NGOs.
    - a. Accomplishments (2009-2010)
      - CCE Hired 2 SCA interns to investigate current research on LWD and develop summary report.
      - Presentation by SCA intern (Taylor) 8/09
      - Research completed spring 2010
      - Draft report completed 5/2010,
    - b. Work plan (2010-2012)
      - Final report to be completed by 12/2010
      - Public presentation on LWD findings Fall/Winter 2010.

## Aquatic and Riparian Ecosystem Assessment

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**Recommendation 10: Continue research, evaluation, and monitoring efforts on Aquatic Ecosystems in the Watershed to improve best management practices.**

**Action Item 10.1** Explore opportunities for operational adjustments of the Shandaken Tunnel to accommodate the needs of biota along with other stakeholders.

- a. Lead Agency: CCE
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
  - i. Coordinate with USGS/DEC grant “Quantitative Assessment of Water Quality in the Upper Esopus Creek: fish, macro invertebrates, periphyton, turbidity and nutrients” NY DEC and USGS Grant to: “provide a comprehensive assessment of biological condition (fish, invertebrates and algae); quantify areas of high sediment and turbidity, and possible sources nutrient enrichment in the Upper Esopus Creek. In addition, provide recommendations on management strategies to improve biological condition and water quality based on the data collected”
    - a. Accomplishments (2009-2010)
      - CCE staff (Keller) provided support to USGS project summer 2009.
      - Presentation at 8/09 Advisory Council meeting by B. Baldigo and Mark Loete
      - AWSMP Matching Funds Grant to support field staff for Summer 2010.
    - b. Work plan (2010-2012)

- Results to be shared with public starting in fall 2010.

**Action Item 10.2** Further inventory and characterize wetlands along the main-stem Esopus Creek.

- a. Lead Agency: DEP
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
  - i. Coordinate with DEP/UCCC research team to share information as it is available
    - a. Accomplishments (2009-2010)
      - DEP team provided update to their project at 8/2009 Ecosystem Working Group Meeting.
    - b. Work plan (2010-2012)
      - Request additional updates on project.

**Action Item 10.3** Support further aquatic bio-monitoring and studies of other wildlife, their habitats, and interactions in the watershed by the multitude of public agencies and interest groups.

- a. Lead Agency: CCE
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
  - i. Coordinate with DEC/USGS research grant Quantitative Assessment of Water Quality in the Upper Esopus Creek: fish, macro invertebrates, periphyton, turbidity and nutrients” NY DEC and USGS Grant to: “provide a comprehensive assessment of biological condition (fish, invertebrates and algae); quantify areas of high sediment and turbidity, and possible sources nutrient enrichment in the Upper Esopus Creek. In addition, provide recommendations on management strategies to improve biological condition and water quality based on the data collected”
    - a. Accomplishments (2009-2010)
      - CCE provided support to purchase Telemetry Equipment through a Matching Grant and provided office space for summer field staff in 2009.
    - b. Work plan (2010-2012)
      - Public presentation on findings
  - ii. Hold regular working group meetings
    - a. Accomplishments (2009-2010)
      - 2 Ecosystem Working Group Meetings (2009)
    - b. Work plan (2010-2012)
      - Establish Assessment Working Group (to replace Ecosystem Working Group)
      - Hold quarterly meetings. Use group to establish data needs and assessment priorities.
  - iii. Hold an annual research conference for researchers working in the Ashokan Watershed, or coordinate panel at existing conferences
    - a. Accomplishments (2009-2010)
      - Met with W. Keller and B. Baldigo about sponsoring conference in Catskills similar to annual conference Baldigo coordinates for Adirondack Region
    - b. Work plan (2010-2012)
      - Catskill research conference is planned for November 2010 in collaboration with USGS, DEP and DEC.

- Panel of Ashokan Watershed researchers at watershed conference in September 2010.

## Economic and Community Impact Assessment

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### **Recommendation 11: Study the economic impacts of stream-based recreation and tourism related activities on the local economy.**

**Action Item 11.1** Economic impact assessment of stream based tourism, including an economic analysis and review of resource limitations/needs. A study should address stream conditions, resource limitations and the status of support industries such as tackle shops, campgrounds.

- a. Lead Agency: CCE
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
  - i. Lit review on economic impact of stream based tourism. Estimate multiplier effect of fishing-based businesses on local economy. Estimate current impact and feasibility of expansion. Work with UC Tourism and UC Economic Development, CWC, Catskill Center, and KCCNY. Disseminate information to stakeholders
    - a. Accomplishments (2009-2010)
      - CCE researched prior similar studies done in the Ashokan Watershed or WoH watersheds. Identified study done by CWC. Contacted UC Planning, Catskill Center, and UC Economic Development to determine what type of project would be useful for other efforts in the region.
    - b. Work plan (2010-2012)
      - Issue RFP to update study and share results with affected communities and organizations.

## 2. Riparian Corridor Improvements (CSBI)

*Activities to protect and enhance the riparian corridor of streams in the Ashokan Watershed*

### **Recommendation 12: Develop and improve landowner incentive programs to encourage voluntary participation in riparian zone protection and enhancement programs.**

**Action Item 12.1** Identify riparian areas of particular environmental benefit or concern and create a database of targeted properties for riparian zone improvement programs.

- a. Lead Agency: UC SWCD
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
  - i. Develop a map and database of targeted properties
    - a. Accomplishments (2009-2010)
      - Limited success using current available imagery, small database based on local knowledge started
    - b. Work plan (2010-2012)
      - Evaluation of two tributaries utilizing updated imagery to be completed by Winter 2010/2011. Complete Ashokan Watershed by Winter 2012
      - New York Natural Heritage Program to begin Riparian Reference Reach study for selected streams in Ashokan Watershed (Summer/Fall 2010). Data to be used to guide restoration plantings.

**Action Item 12.2** Identify existing incentive programs that are applicable to landowners in the watershed and develop outreach materials for landowners regarding these programs. Directly contact landowners with targeted properties.

- a. Lead Agency: UC SWCD
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
  - i. Outreach materials for CSBI are identified and/or developed
    - a. Accomplishments (2009-2010)
      - CSBI program has developed outreach materials
      - Delivered talk on CSBI program to Native Plant Workshop
    - b. Work plan (2010-2012)
      - Ongoing outreach to targeted properties.
  - ii. CSBI Coordinator and CCE Staff trained on existing incentive programs
    - a. Accomplishments (2009-2010)
      - AWSMP staff attended in-service in Delaware County on existing incentive programs for private landowners
    - b. Work plan (2010-2012)
      - No trainings planned
  - iii. Intake and assessment forms for landowners are developed that triage available programs
    - a. Accomplishments (2009-2010)
      - Ashokan Program developed landowner intake form to help assess landowner needs
      - CSBI program has developed application form

- Developed outreach packet materials for delivery during site visits

b. Work plan (2010-2012)

- Develop database to support forms (to be completed Winter 2010)

**Action Item 12.3** Initiate riparian buffer programs on lands currently not covered by DEP watershed programs (CSBI Program).

a. Lead Agency DEP/UCSWCD

b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan

i. Coordination of CSBI and Riparian Buffer Enhancement Program, Work with Riparian Buffer Working Group to refine CSBI program rules as needed

a. Accomplishments (2009-2010)

- CSBI rules finalized.

b. Work plan (2010-2012)

- Completed, none planned

ii. As soon as the CSBI Coordinator is hired and materials are in place, documented outreach to local landowners on availability of incentive programs, particularly CSBI

a. Accomplishments (2009-2010)

- CSBI coordinator, Adam Doan, hired 11/09
- Coordinator attended bio-engineering training and Rosgen Level I training
- Began targeted outreach for CSBI
- Received 5 applications for CSBI, three have been approved for funding

b. Work plan (2010-2012)

- Integrate CSBI database developed with DEP into outreach monitoring plan (Summer 2010).

iii. Informational materials and enrollment forms will be made available in Project Office and with Town and Village Planning and Zoning staff. Outreach to planning and zoning staff and code enforcement officers about the programs.

a. Accomplishments (2009-2010)

- Enrollment forms are available in office and on-line

b. Work plan (2010-2012)

- Continue to make forms available

**Action Item 12.4** Provide long term riparian buffer protection through permanent conservation easements for both currently degraded and intact buffer areas.

a. Lead Agency: DEP, CCE

b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan

i. CCE will provide outreach through their website, newsletters and other methods to local landowners on availability of easement programs.

a. Accomplishments (2009-2010)

- CCE advertised NRCS floodplain easement program in fall 2009 on their website, contacted town supervisors in the

watershed about the program and contacted targeted landowners directly.

b. Work plan (2010-2012)

- None planned

ii. Informational materials and enrollment forms available on easement programs in Project office and with Town and Village Planning and Zoning staff.

a. Accomplishments (2009-2010)

- CCE received this information from DEP and it is available in the office.

b. Work plan (2010-2012)

- None planned

**Action Item 12.5** Develop reliable local sources of native plant material.

a. Lead Agency: UC SWCD

b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan

i. UC SWCD is developing a plant materials center at the Ashokan Watershed Office.

a. Accomplishments (2009-2010)

- Winterberries and sedges are currently being maintained at the Ashokan Office for use in stream projects in 2010.

b. Work plan (2010-2012)

- Store additional potted plant materials at office site
- Investigate locations of native willows for use as cuttings to establish willow beds (Winter 2010).
- Start willows at office site for use as plant material in projects (Winter 2010)
- Investigating additional locations for willow bed plantings for use in restoration projects (Summer/Fall/Winter 2010).
- Stream Steward volunteers trained to collect native seeds for restoration projects.

**Recommendation 13: Develop a riparian enhancement education program that assists landowners in education on the role of riparian buffers in protecting their property and supports landowner incentive programs, in particular the Catskill Streams Buffer Initiative.**

**Action Item 13.1** Provide streamside landowners and others detailed technical information through publications and the project website on the best practices for establishment and maintenance of riparian buffers.

a. Lead Agency: SWCD/CCE/DEP

b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan

i. Information about CSBI is available on the website including a publication for the public on establishing and maintaining riparian buffers

ii. Feature riparian buffers at one program for the public each year

a. Accomplishments (2009-2010)

- Native Plant Workshops in February 2009 and March 2010

b. Work plan (2010-2012)

- Continue to offer annual native plant workshop

**Action Item 13.2** Write articles for newspapers, newsletters, radio and television on the value of riparian buffers to reach wide audience

- a. Lead Agency: CCE
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
  - i. One of the three issues of Esopus Creek newsletter will feature riparian buffers.
    - a. Accomplishments (2009-2010)
      - Spring, 2010 newsletter featured launching of CSBI
      - Streamside landowner guide was included in spring, 2009 issue highlighting importance of streamside buffers.
    - b. Work plan (2010-2012)
      - Riparian buffers and planting projects will be featured in one issue of Esopus Creek News annually
  - ii. Develop a media outreach plan around riparian buffers and other BMPs by the fall 2009
    - a. Accomplishments (2009-2010)
      - Media and outreach strategy developed: including initially using newsletter and direct outreach to landowners identified as needing riparian enhancement.
      - CSBI program announcement covered by local press
    - b. Work plan (2010-2012)
      - Monitor response to current outreach and assess need for changing media and outreach plan for CSBI.
      - Assessment of need for broader advertising will be based on number of qualifying CSBI projects and capacity for further applicants in the fall of 2010

### 3. Municipal Coordination and Assistance

*Coordination of Municipal Projects and Plans with Watershed Projects and Assessments. Providing grants and other support.*

#### Coordination with Floodplain Management Efforts

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**Recommendation 14: Support town adoption of the revised Flood Insurance Rate Maps (FIRM) and provide training for local floodplain managers.**

- Action Item 14.1** Provide training for local floodplain managers in use of revised maps
- a. Lead Agency: CCE
  - b. Planned Activity/Outcome(s) for – 2011 Ashokan Action Plan:
    - i. Depends on status of FIRMs
      - a. Accomplishments (2009-2010)
        - CCE coordinated with DEP and DEC on meeting for Watershed Towns to review FIRM maps and make recommendations for priority study areas for new FIRMs 4/2010.
        - CCE staff attended floodplain manager training in Oneonta to prepare to assist watershed towns with outreach on new FIRMs 5/2010
        - Higgins gained CFM certification (certified floodplain manager) with support from DEP and SWCD Delaware County.
      - b. Work plan (2010-2012)
        - Continue to support NYS DEC/FEMA trainings for local floodplain managers on FIRM maps

**Recommendation 15: Where existing communities, structures and facilities are in at-risk locations, encourage the application of flood-proofing measures or relocation.**

- Action Item 15.1** Work with the Town of Shandaken to apply flood-proofing measures in the hamlet of Phoenicia as a pilot during the five year project
- a. Lead Agency: CCE
  - b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan:
    - i. Meet with Town of Shandaken to determine interest in this item, and to investigate sources of technical assistance and funding. If there is interest, inventory properties and infrastructure that are prone to flood damage, make recommendations for flood-proofing. Work with Town to find funding to implement the recommendations.
      - a. Accomplishments (2009-2010)
        - CCE met with Town of Shandaken Supervisor 9/09 to assess interest in applying for NYS DOS funds for this activity in Phoenicia. Shandaken was not ready to submit application for this.



- b. Work plan (2010-2012)
  - Revisit this issue with new administration. Explore interest in applying for AWSMP funds to study retrofit or relocation options.

**Recommendation 16: Municipalities in the Watershed should conduct a review of current floodplain ordinances and adopt revisions as appropriate. Prevent inappropriate development in areas of high flood or erosion risk and foster uses that are compatible with the anticipated flooding and erosion conditions. Revisions should reflect current building trends, new technologies compliance and integrate broader community plans as appropriate.**

**Action Item 16.1** Using results of revised FIRMs and the Stream Erosion Hazard Area assessment, work with municipalities to identify how existing ordinances can be improved to limit damaging land use in the floodplain.

- a. Lead Agency: CCE
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan:
  - i. Contingent upon completion of FIRMs and revision of Stream Erosion Hazard Area assessment. Upon completion of both, then this activity can commence.
    - a. Accomplishments (2009-2010)
      - None, revised FIRMs not yet completed.
    - b. Work plan (2010-2012)
      - Depends on firms and interest of communities. If interested would use Community Rating System through National Flood Insurance Program as the basis for this work. Possibly support consultant to provide assistance to towns.

**Recommendation 17: Support implementation of Ulster County’s Hazard Mitigation Plan in the Town of Shandaken, with emphasis on addressing flooding and stream erosion hazards, and encourage towns in the watershed without Hazard Mitigation Plans to develop plans.**

**Action Item 17.1** Ulster County has a FEMA-approved Hazard Mitigation Plan. Work with the Town of Shandaken and the Town of Hurley, the towns that supported the County’s HMP effort, to be prepared for use of State mitigation funding following declared State emergencies.

- a. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan:
  - i. Periodically revise proposed project list and designs to incorporate new information, funding, and technical support.
    - a. Accomplishments (2009-2010)
      - CCE/SWCD is working with Town of Shandaken to develop project plans for their grant proposal to receive mitigation funding (Fawn Hill Project in Woodland Valley) (See 18.1)
    - b. Work plan (2010-2012)
      - Complete Woodland Valley project. (See 18.1)

- Develop standards for culverts and bridges and develop list of culverts/bridges that do not meet standards (See RFP in Assessment Section).
- ii. Work with Towns of Olive and Woodstock to see if they can retroactively participate in the FEMA Hazard Mitigation Plan implementation.
  - a. Accomplishments (2009-2010)
    - SEMO representative at Watershed Conference provided information to participants in non-participating towns about process to be included in County plan. (5/2010)
  - b. Work plan (2010-2012)
    - Work with towns to participate in Hazard Mitigation plan

### **Coordination around Road Maintenance, Related Drainage and Bridges**

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**Recommendation 18: Watershed communities should develop and implement comprehensive stormwater management plans which will protect water quality as well as reduce impacts on stream morphology.**

**Action Item 18.1** Meet with Towns, CWC, and UC DOE to identify status of stormwater management planning and formulate recommendations for developing or improving, as needed.

- a. Lead Agency: UC SWCD/CCE
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan:
  - i. Convene meetings and make recommendations, as needed.
    - a. Accomplishments (2009-2010)
      - Met with DOE regarding stormwater planning requirements in Ashokan Watershed and status
      - Held conference in watershed focusing on flooding and erosion
    - b. Work plan (2010-2012)
      - Providing detailed training to area stakeholders (mainly focused on municipal employees) from Cornell Local Roads for BMP installation of runoff drainage on roads and driveways
      - RFP for Investigation of contribution from driveways and private roads to sediment and stormwater loading with goal of recommended BMPs for the Catskills.
  - ii. Work with involved parties to secure funding to implement recommendations.
    - a. Accomplishments (2009-2010)
      - Assisted Ulster County in applying for DOS grant and CWC grant to investigate roadside ditches and driveways impact on stormwater in Watershed (not funded).
    - b. Work plan (2010-2012)
      - Will continue to explore funding possibilities
      - Bridges: Work with County and municipalities to support implementing recommendations from study in 17i.

**Recommendation 19: Encourage collaboration between state and local highway departments and stream management personnel to develop specifications for applying natural channel design concepts to bridge rehabilitation and replacement.**

**Action Item 19.1** Convene periodic meetings with the Highway Superintendents for each of the Ashokan watershed municipalities, Ulster and Greene County DPW staff, and NYS DOT representatives to discuss opportunities for collaboration and technical support.

- a. Lead Agency: UC SWCD
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan:
  - i. Attend a monthly Ulster County Highway Superintendant meeting to explain the Program.
    - a. Accomplishments (2009-2010)
      - See item ii
    - b. Work plan (2010-2012)
      - Continue to work through monthly Highway Managers Meeting (item 18.1ii)
  - ii. Establish a quarterly or semi-annual meeting with all relevant local, county, and State highway personnel to identify shared stream/road concerns and evaluate opportunities to support coordinated effort to use BMPs. Develop annually revised work plans for collaboration.
    - a. Accomplishments (2009-2010)
      - Held monthly highway manager meetings at AWSMP office
      - Identified several bridge projects
      - Met with Ulster County bridge engineer to discuss plans for bridge replacement in McKinley Hollow.
      - Met with Town of Woodstock highway manager and identified need for geomorphic assessment on Van Hoagland Bridge in Woodstock.
    - b. Work plan (2010-2012)
      - Outreach to towns and other municipal agencies to evaluate need for bridge replacements due to hydraulic constrictions
      - Complete geomorphic assessment of McKinley Hollow Bridge by Spring 2011
      - Complete geomorphic assessment of Van Hoagland Bridge by Summer 2011

**Recommendation 20: Local municipalities, Greene and Ulster County Highway Departments and NYSDOT, should place a priority on vegetation management on critical areas such as roadside ditches and steep slopes. Develop programs to provide road maintenance crews with additional resources for seeding newly cleaned ditches with native ground-cover appropriate for reclamation.**

**Action Item 20.1** Meet with all highway departments operating in the Ashokan watershed to identify current roadside ditch and steep slope vegetation management practices and provide support as needed to improve those practices.

- a. Lead Agency: UC SWCD

- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan:
- i. Documented assessment and plan for improving quality of vegetation management practices. Convene meetings and make recommendations, as needed. Work with highway departments to secure funding to implement recommendations.
    - a. Accomplishments (2009-2010)
      - Met with town highway supervisors to discuss needs for hydro-seeding and current practices
      - Group recommended continued training for town personnel
      - Coordinating Cornell Local Roads training seminar with David Orr
    - b. Work plan (2010-2012)
      - Organize town requirements into strategy for acquiring hydro-seeding opportunities. Coordinate SWCD access to multi-county hydro-seeder.
      - If needed, secure funding to accomplish above strategy.
      - Hold Cornell Local Roads training
  - ii.
    - a. Accomplishments (2009-2010)
      - Held multiple highway manager meetings at AWSMP office
    - b. Work plan (2010-2012)
      - Attend county meetings

**Action Item 20.2** Provide technical assistance to ensure application of fluvial geomorphic principles and fiscal support for bridge replacements in the Watershed as a Program-sponsored demonstration project.

- a. Lead Agency: UC SWCD
- b. Planned Activity/Outcome(s) for 2009 – 2012 Action Plan
  - i. Meet with Shandaken Highway Superintendant and others, as needed to complete geomorphic assessment and design for bridge replacement.
    - a. Accomplishments (2009-2010)
      - On-going meetings with highway managers
      - Assessed and designed on Woodland Valley Road project to stabilize large/steep failing stream bank adjacent to stream.
      - Started assessment of BMPs for ditch management on Crosspatch Road in Woodstock.
    - b. Work plan (2010-2012)
      - Complete Woodland Valley Road project by Fall 2010
      - Complete Crosspatch Road design by Fall 2010
      - Complete Crosspatch Road installation by Summer 2011
  - ii. Contract to provide funding assistance to help procure materials and implementation service.
    - Met with FEMA representatives to provide funding for flood hazard mitigation.
    - Assisted in creating funding application for Woodland Valley Road remediation project.

- Informed municipal groups of FEMA requirements for funding
- b. Work plan (2010-2012)
  - Complete Woodland Valley Road project by Fall 2010

**Recommendation 21: Watershed municipalities should evaluate Winter road abrasive procedures to address abrasive quality, application methods and spring sweeping. Winter road abrasive materials containing high silt/clay content can have a direct impact on water quality. Municipalities should be encouraged to use high quality washed sand materials. Cost share funding may be needed to provide incentive to use more highly priced materials.**

**Action Item 21.1** Meet with all highway departments operating in the Ashokan watershed to assess whether road abrasive material in current use has high clay/silt content and identify options to improve quality of abrasive if needed.

- a. Lead Agency: UC SWCD
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan:
  - i. Convene meetings and make recommendations and work with highway departments to secure funding to implement recommendations.
    - a. Accomplishments (2009-2010)
      - Assessed town needs for street cleaning and vacuuming
      - Evaluated denied County grant application for vacuum /sweeper vehicle. Contacted CWC, UC DOE and DEP for feedback on reasons for denial and provided feedback to Town of Shandaken Highway Department.
    - b. Work plan (2010-2012)
      - Continue investigation with Towns and DEP into the needs of acquiring street sweeper from a water quality perspective and identify appropriate technology, if applicable.

**Recommendation 22: Mitigate the impact of public infrastructure (road, railroad, and utility) encroachment on the riparian vegetation community and aquatic habitats by improved planning, management, supplemental plantings and the improved care of existing vegetation.**

**Action Item 22.1** Work in cooperation with highway departments, utility companies, and Catskill Scenic Railroad, to identify and prescribe specific sites for planting or improved management

- a. Lead Agency: UC SWCD
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
  - i. Identify high priority sites and opportunities for collaboration
    - a. Accomplishments (2009-2010)
      - On-going collaboration with municipal officials and advisory council members.
      - Multiple site visits with landowners in close proximity to streams and roads. Recommended best practices for maintaining riparian vegetation
    - b. Work plan (2010-2012)
      - Continued collaboration with stakeholders.

- Action Item 22.2** Provide funding for plantings either as buffers or as bioengineering/biotechnical stabilization projects.
- a. Lead Agency: UC SWCD
  - b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
    - i. Provide funding as appropriate through CSBI or CCE funds
      - a. Accomplishments (2009-2010)
        - CSBI has been funding these projects
        - SWCD and CCE staff trained in bioengineering methods
      - b. Work plan (2010-2012)
        - Continue CSBI funding, explore appropriate bioengineering sites.

## Coordination with Other Planning and Zoning Activities

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**Recommendation 23: Work with watershed municipalities to evaluate local ordinances such as comprehensive plans, zoning regulations, site plan review laws, subdivision laws and floodplain ordinances to determine if adequate consideration is given to impacts on riparian and aquatic ecosystems.**

- Action Item 23.1** Review local ordinances for municipalities in the watershed in regards to floodplain management (riparian buffer, flood hazard mitigation, stormwater management). Compare local laws to best practices/model regulations. Examine how existing laws/policies are being applied at the local level.
- a. Lead Agency: CCE
  - b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
    - i. Meet with floodplain managers UC DOE, and UC Planning to identify specific policies of concern to be included in the review. Identify best practices/model regulations. Develop a short report highlighting these findings and disseminate information to towns in the Ashokan Watershed.
      - a. Accomplishments (2009-2010)
        - UC DOE has started this project
      - b. Work plan (2010-2012)
        - Coordinate with DOE effort and include examination of local regulations as part of the new FIRM map approval process with the towns.

**Recommendation 24: Support continued exploration of stakeholder liability issues for large woody debris (LWD), as well as jurisdictional responsibility for removal of LWD.**

- Action Item 24.1** Research policy/regulations around liability for large woody debris
- a. Lead Agency: CCE
  - b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
    - i. Literature/Policy review on LWD with best practices from other states. Meeting with stakeholders to review the document and to make local recommendations for policy change where needed.
      - a. Accomplishments (2009-2010)

- SCA interns initiated investigation on current research recommendations for LWD management.
- b. Work plan (2010-2012)
  - Investigation into policies related to research recommendations

**Recommendation 25: Public access to the streams should be enhanced in the watershed.**

**Action Item 25.1** Identify potential stream access sites in the watershed.

- a. Lead Agency: CCE
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
  - i. Include a representative from whitewater boating community as a stakeholder for the review panel for Stream Management Projects when appropriate.
    - a. Accomplishments (2009-2010)
      - No stream projects have been proposed for development in a whitewater boating area during this period
    - b. Work plan (2010-2012)
      - Include representatives as appropriate.

**Action Item 25.2** Make improvements to existing stream access sites

- a. Lead Agency: CCE
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
  - i. Encourage grants for stream access improvements
    - a. Accomplishments (2009-2010)
      - Improvement of stream access points are listed as a priority for Mini grants
    - b. Work plan (2010-2012)
      - Continue to encourage applications

**Recommendation 26: Investigate opportunities to develop multi-use, low impact trail systems along the stream corridor. Trails for hiking, biking, cross country skiing and snowshoeing can provide multiple benefits, including drawing visitors to local resorts and increasing user awareness of stream management issues.**

- a. Lead Agency: CCE
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
  - i. Participate in efforts led by other organizations as appropriate, including Rt. 28 Corridor Project.
    - a. Accomplishments (2009-2010)
      - Participate in Rt. 28 Corridor Project
      - Provided funding through a Mini Grant to support a Kiosk along Rt. 28 that will highlight hiking and other recreational opportunities along the streams in the Ashokan Watershed.
    - b. Work plan (2010-2012)
      - Continue to encourage applications to mini grant or matching grant program

## 4. Reach-level Stream Plans and Projects

*Stream Projects that are identified as high priority through the Assessment Process*

**Recommendation 27: Annually update and prioritize stream restoration and/or channel stabilization projects identified in each management plan and support efforts to obtain funding to design and implement them.**

**Action Item 27.1** Develop a list of candidate stream corridor projects (includes reach scale restoration, hydraulic constriction mitigation, water quality improvement projects; does not include site scale bank stabilization) through review of existing Stream Management Plans, current stream assessments, recommendations from Highway departments and municipalities.

- a. Lead Agency: UC SWCD
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
  - i. Review of available planning and assessment documentation
    - a. Accomplishments (2009-2010)
      - Reviewed available assessment documentation. Included previously identified projects on project list
    - b. Work plan (2010-2012)
      - Continue to utilize past and current documentation to incorporate potential projects onto project list.
  - ii. Develop a sub-committee for project review
    - a. Accomplishments (2009-2010)
      - Established AWSMP sub-committee for project review. Held two meetings and established general process for incorporating sub-committee feedback into projects
    - b. Work plan (2010-2012)
      - Continue regular sub-committee meetings
  - iii. Solicitation for candidate sites from municipalities
    - a. Accomplishments (2009-2010)
      - Met with multiple municipal officials and adopted projects they identified onto AWSMP project list. This list includes projects for the towns of Shandaken, Woodstock and Olive, as well as, Ulster County.
    - b. Work plan (2010-2012)
      - Continue to reach out to municipal officials through meetings held at AWSMP office, attendance to town meetings and one on one discussion with area leaders.

**Action Item 27.2** Work on assessment, and if project is determined to be feasible, design and construction of prioritized candidate stream corridor project. *If a feasible project is not identified then an additional site from the candidate list developed in Action Item 1 above will be investigated.* The first priority project is an investigation into treatment alternatives for the “Chichester” reach of Stony Clove Creek (Management Units 17 and 18 in the Stony Clove SMP). This is a reach of Stony Clove



Creek between Silver Hollow bridge and the Route 214 bridge in Chichester. This reach is a chronic source of turbidity in Stony Clove Creek from stream bank erosion and adjacent hill slope failure.

- a. Lead Agency: UC SWCD
- b. Planned Activity/Outcome(s) for 2010 – 2012 Ashokan Action Plan:
  - i. Assessment and Project Assessment Report, Engineering design and Project Conceptual Design Report, Project Final Design, Constructed Project with Report
    - a. Accomplishments (2009-2010)
      - Designed remediation project for large stream bank failure site which is adjacent to Woodland Valley Road. Planning on installation of project in summer 2010 pending financial support from FEMA.
      - Contracted with Malone and MacBroom engineering services for preliminary site assessment of the Chichester Reach. Assessment report indicated more investigation was required, as well as, possible remediation solutions.
    - b. Work plan (2010-2012)
      - Installation of Woodland Valley Road project (summer 2010)
      - Continued support of DEP sponsored evaluation of Chichester Reach by Malone & MacBroom engineering (2011).
      - Construction support of Chichester project (2012).
      - Evaluation, assessment and possible construction of restoration project on Warner Creek to stop erosion of clay banks (assessment 2010, construction 2011)
      - Evaluation, assessment and possible construction of restoration project on Esopus Creek. Potential to hire Dave Rosgen for design and construction.
      - Continue to address projects (assessment and construction) identified through municipal officials. List includes BMP for ditch management in Woodstock and Olive. Arresting stream bank erosion and reduce potential flood danger in Shandaken.
      - Continue to address landowner request for assessment and evaluation of sites. Incorporate into project list if deemed to have broader implications for multiple stakeholders.

## 5. Training and Technical Assistance for Resource Managers and Streamside Landowners

### Resource Managers

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#### Recommendation 28: Provide training on revised FIRMs for local floodplain managers.

- Action Item 28.1** Provide training for local floodplain managers in revised maps
- a. Lead Agency: CCE
  - b. Planned Activity/Outcome(s) for – 2011 Ashokan Action Plan:
    - i. FEMA-sanctioned training to be offered to municipalities
      - a. Accomplishments (2009-2010)
        - CCE sponsored NYS DEC training on National Flood Insurance Program at May Watershed Conference
        - Shandaken Code enforcement officer attended Floodplain management training in Oneonta in early May.
      - b. Work plan (2010-2012)
        - Provide assistance to NYS DEC/DEP as needed for FIRM map trainings
        - Provide additional workshops or presentations as needed.

#### Recommendation 29: Increase access to flood prevention/protection information in the watershed.

- Action Item 29.1** The Ashokan Watershed SMP Field Office in Shandaken will be a host site for flood prevention/protection information.
- a. Lead Agency: CCE
  - b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan:
    - i. CCE will create a physical and digital library of resources for Ashokan watershed Towns and residents.
      - a. Accomplishments (2009-2010)
        - Resources have been identified and a library of Flood and National Flood Insurance Program related resources is in process
        - Ulster County Emergency Management and FEMA offer many of the resources on line.
      - b. Work plan (2010-2012)
        - Links to FEMA and Ulster County Resources will be established on Ashokan Watershed SMP website
        - Library of resources will be improved and expanded.
- Action Item 29.2** Develop a flood emergency preparedness program for stream management stakeholders. Watershed municipalities, working with local and state agencies, should support periodic training sessions on flood related issues. Audience should include municipal leaders, code enforcement staff, planning boards, landowners, realtors, lending institutions and others
- a. Lead Agency: CCE

- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan:
- i. Offer workshop on flood emergency preparedness topics at May 2010 Watershed summit.
    - a. Accomplishments (2009-2010)
      - Multiple speakers at the 2010 Watershed Conference covered topics on floodplain planning and development including Art Snyder, Director of Ulster County Emergency Management and regional SEMO representative
      - Produced and distributed Flood Emergency Preparedness Fact Sheet. Provided to all 2010 conference participants.
      - Included flood emergency preparedness articles in Spring, 2010 newsletter
      - Shandaken code enforcement officer sponsored for NYS DEC Floodplain Management training in Oneonta in May 2010.
    - b. Work plan (2010-2012)
      - Offer Certified Floodplain Manager course and test in Ulster County. Offer continuing education credit opportunities for floodplain managers and other municipal officials.

**Recommendation 30: During periods of post -flood response, municipalities need information and technical support to minimize impacts on stream system stability. Documented guidelines for “repairs” of flood damaged streams and drainage systems with best management practices advocated by the AWSMP would greatly reduce risk of further instability. Guidelines, which integrate stream form and function, should be developed for use during post flood response.**

**Action Item 30.1** CCE, UC SWCD, and DEP will work with WOH watershed stream management partners to develop documentation of guidelines for post-flood response to stream channel and corridor. *This Action Item is contingent upon coordination with WOH watershed Stream Management Program partners, and local, state and federal agencies.*

- a. Lead Agency: Multiple
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan::
  - i. Convene coordinated inter-basin meeting to strategize content and format of proposed guidance document. Work with partners and consultants, if needed, to publish guidelines.
    - a. Accomplishments (2009-2010)
      - CCE participated in review and comment on Delaware County SWCD training program
    - b. Work plan (2010-2012)
      - Continue to participate in this effort as appropriate
      - Publicize documents, trainings and other resources on this topic developed by WoH partners.

**Recommendation 31: Assist local landowners, contractors and others in designing and implementing best management practices to reduce erosion**

**Action Item 31.1** Develop a document that describes appropriate best stream management practices to address stream bank erosion for use in the Ashokan watershed. CCE, UC SWCD, and DEP will work in conjunction with other watershed partners to develop this document. The final document will be intended to have application beyond the Ashokan watershed. *This Action Item is contingent upon coordination with WOH watershed Stream Management Program partners, and local, state and federal agencies*

- a. Lead Agency: Multiple
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan:
  - i. Convene inter-basin committee to develop a document describing recommended BMPs for use in addressing stream bank erosion in the Catskill Mountains.
    - a. Accomplishments (2009-2010)
      - The need for this document was discussed at Annual WoH Partner meeting in February 2010 and at the WOH education and outreach meeting in May 2010. There is consensus among the watersheds that this document is a priority
    - b. Work plan (2010-2012)
      - Participate in WoH effort to develop strategy to develop this document

**Action Item 31.2** Provide long term access to technical assistance to landowners and municipalities for assessment of their stream-related problems. Help landowners develop effective management strategies for their property and supervise stream project implementation.

- a. Lead Agency: UC SWCD
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan:
  - i. Provide regularly scheduled times in office or for site visits to assist streamside landowners and municipalities with evaluating and addressing stream-related problems.
    - a. Accomplishments (2009-2010)
      - Meetings with landowners and municipalities
      - Have established day (Fridays) for landowner site visits
      - Identified need for additional support for landowners through a class or other self-assessment strategy to help accommodate more landowners given staffing constraints.
    - b. Work plan (2010-2012)
      - Improve triaging methods for site visits
      - Develop class or self-assessment strategy for landowners
  - ii. Develop/seek opportunities to demonstrate evaluation techniques and effective management strategies as part of the education & outreach program.
    - a. Accomplishments (2009-2010)
      - Offered Rosgen training to highway managers and others in Ashokan Watershed.

- Have extended offer to local partners for other trainings offered by WoH partners, including Delaware County floodplain training, flood response training and Sullivan County bioengineering training.
- b. Work plan (2010-2012)
  - Offer at least one training per year for resource managers on management strategies. Planned trainings include:
    1. Cornell Local Roads ditch and culvert training for Ashokan watershed highway staff (fall 2010)
    2. Bioengineering training for local contractors (Fall 2010, as part of WoH training in October)
- iii. Provide funding, through CSBI, CCE implementation funds, or UC SWCD project funds to encourage landowners and municipalities to participate in developing and implementing management plans.
  - a. Accomplishments (2009-2010)
    - See CSBI (Riparian) Section
  - b. Work plan (2010-2012)
    - Continue to encourage CSBI
    - Develop landowner self-assessment protocol
- iv. Organize an annual Ashokan Watershed Conference with workshops on effective stream management strategies for resource managers and landowners.
  - a. Accomplishments (2009-2010)
    - Conference held May 1<sup>st</sup>. Representation by Municipal officials and employees and landowners. Included presentations on stormwater management and driveway and culvert management.
  - b. Work plan (2010-2012)
    - Continue to offer annual conference in Spring
    - Establish committee to set priority topics for conference (Fall 2010)

## Streamside Landowners

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### **Recommendation 32: Assist local landowners, contractors and others in designing and implementing best management practices to reduce erosion**

- Action Item 32.1** Identify existing incentive programs that are applicable to landowners in the watershed and develop outreach materials for landowners regarding these programs. Directly contact landowners with targeted properties.
- a. Lead Agency: UC SWCD
  - b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
    - i. Promote CSBI program to landowners (See Section 2 Riparian Corridor)
    - ii. Develop Intake and assessment forms for landowners are developed that triage available programs

- a. Accomplishments (2009-2010)
  - Developed assessment log and process to intake landowners
  - Developed and handout educational packet to all site visits
  - Made multiple site visits to evaluate and assess landowner issues (>20 visits).
  - Initiated process for site visit reports and rapid assessment of landowner properties.
- b. Work plan (2010-2012)
  - Continue support of watershed landowners with site visits, informational packets and formal site reports.
  - Integrate intake form into database to better track landowner needs
  - Develop landowner screening tool to help them identify programs that they are eligible for.

## 6. Community Engagement and Communication

### Stream Stewards Volunteer Program

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**Recommendation 33: Develop a local group of volunteers committed to ongoing stewardship efforts in the watershed.**

- Action Item 33.1**      Develop the Ashokan Watershed Stream Stewards Volunteer Program as a primary source of committed and trained volunteers for community stewardship projects that support the goals of the AWSMP.
- a.    Lead Agency: CCE
  - b.    Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
    - i.    Provide a one day training in basic stream stewardship concepts to give volunteers a common background and overview of potential volunteer projects.
      - a.    Accomplishments (2009-2010)
        - Draft training program developed
        - Date set for training (July 2010)
      - b.    Work plan (2010-2012)
        - Hold training and assess effectiveness
        - Revise training based on participant feedback
        - Hold training in 2011 and 2012
    - ii.    Provide weekend and evening core volunteer activities that integrate mini trainings as part of the activities.
      - a.    Accomplishments (2009-2010)
        - Knotweed pull, May 2009
        - Native Plant workshops
        -
      - b.    Work plan (2010-2012)
        - Stream Clean-up, June 2010
        - Other training/volunteer programs planned include: GPS data collection, LWD and Flood Photo Monitoring, Native Seed Collection, Using the Stream Table in presentations.
    - iii.    Host regular meetings with volunteers to organize volunteer activities and additional brief training sessions.
      - a.    Accomplishments (2009-2010)
        - Meetings held in 2009
        - Monthly meeting schedule established in 2010, volunteer coordinator position added to staff
      - b.    Work plan (2010-2012)
        - Continue to hold monthly meetings and actively recruit new members.
    - iv.    Reach volunteers through use of website, local media, and other outreach efforts Put volunteer applications, job descriptions available on website Press

releases announcing program and events covered local papers and improve database to be able to better track volunteer participation and manage volunteers

- a. Accomplishments (2009-2010)
- b. Work plan (2010-2012)

## Youth Stewards Program

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**Recommendation 34: Include youth programming to teach youth about the value of stream ecosystems and riparian habitats, with goal of reaching adults and for general outreach about programs**

- a. Lead Agency: CCE
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
  - i. Youth Steward Program at Onteora Middle/High School
    - a. Accomplishments (2009-2010)
      - Youth Stewards Program met for 3 semesters, averaged 5-8 students per semester. Students met once time per week. students learned wetland delineation, used GPS/GIS to delineate and map knotweed project and gave a presentation at a regional youth symposium.
    - b. Work plan (2010-2012)
      - This internship program will not be continued due to County budget cuts, as staffing for the program was supplemented by CCE Ulster County. The internship program will be replaced by family oriented programs in the community.
  - ii. Offer at least one family-oriented program per year
    - a. Accomplishments (2009-2010)
      - Stream table presentations to youth and families at Ulster County Fair and Shandaken Day
    - b. Work plan (2010-2012)
      - Family activities at Stream Clean-up June 2010
      - Will offer family-oriented activities during Ulster County Creek Week September 2010
      - Continue
  - iii. Work with outreach staff to ensure media follow-up from youth events/projects
    - a. Accomplishments (2009-2010)
      - Press releases sent out for local youth attendance at regional conferences
    - b. Work plan (2010-2012)
      - Will continue to send out press releases and seek press coverage for activities by youth.
  - iv. Coordinate with other local and DEP-led youth efforts, when feasible.
    - a. Accomplishments (2009-2010)
      - Stream field day – Staff provided programming for Onteora High School AP Environmental Studies class, Oct. 2009



- Staff participated in an Environmental Educators Panel at Onteora High School - April, 2010
  - Staff participated in the April 2009 and 2010 Environmental Awareness Days which offered programming to 6<sup>th</sup> graders in the County.
- b. Work plan (2010-2012)
- Continue to participate as staff resources permit.

## Public Outreach and Communication

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### Recommendation 35: Organize public events to support other recommendations and effective stream management strategies

**Action Item 35.1** Host an annual conference and other workshops that promote an understanding of effective stream management strategies for local stakeholders.

- a. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
- i. Organize annual Ashokan Watershed Conference
- a. Accomplishments (2009-2010)
- 1<sup>st</sup> Watershed Conference held May, 2010. Over 60 participants.
- b. Work plan (2010-2012)
- Planning 2<sup>nd</sup> Watershed Conference for April 2011
- ii. Hold at least three public educational events per year on stewardship topics relevant to the Ashokan Watershed.
- a. Accomplishments (2009-2010)
- Native Plant Workshop, Feb 2009
  - Knotweed pull and demonstration site, May 2009
  - Streamside stewardship tour, July, 2009
  - USGS Presentation – the Shocking Truth, August, 2009
  - Open House and BBQ, Aug, 2009
  - Dave Rosgen Public Presentation, Oct, 2009
  - Native Plant Workshop, March, 2010.
- b. Work plan (2010-2012)
- Stream Clean-up, June 2010
  - Organize an Ashokan Watershed “Creek Week” with a set of stream-related educational and recreational activities to promote connection to streams.
  - Additional speakers and programs to be offered quarterly

### Recommendation 36: Solicit participation of local community members and education-related programs in the Education and outreach activities.

- a. Lead Agency: CCE
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
- i. Organize quarterly Education and Outreach Working Group meetings.

- a. Accomplishments (2009-2010)
  - Education and Outreach Group met April 2009
  - Ashokan Watershed Conference Committee met June 2009
- b. Work plan (2010-2012)
  - Re-established Education and Outreach Group, 1<sup>st</sup> meeting June 2010
- ii. Fund education and outreach activities through the Mini and Matching Grant Programs
  - a. Accomplishments (2009-2010)
    - Mini Grant to Trout Unlimited to support “Leaping Trout Art Project”
    - Mini Grant to Catskill Center for Conservation and Development for Kiosk Panel Project
    - Publications and public presentations included as deliverables in research grants funded through the program
  - b. Work plan (2010-2012)
    - Continue to support and encourage partnerships through grant programs

**Recommendation 37: Develop a series of publications focused on stream management which can be provided to watershed stakeholders and/or used in training workshops including fact sheets, newsletters, website, and landowner stream management guidelines.**

**Action Item 37.1** Develop Education and Outreach materials for streamside landowners and other stakeholders in the communities of the Ashokan Watershed.

- a. Lead Agency: CCE
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
  - i. Publish a newsletter mailed to our mailing list three times per year and solicit email options as much as possible.
    - a. Accomplishments (2009-2010)
      - Three issues published in 2009 and Spring, 2010 published
    - b. Work plan (2010-2012)
      - Continue to publish newsletter as scheduled
  - ii. Develop and produce factsheets that address common stream management questions in 2010
    - a. Accomplishments (2009-2010)
      - Two factsheets developed, Stream Project Permit Guide and Flood Emergency Preparedness Guide
    - b. Work plan (2010-2012)
      - Six additional factsheets will be developed by 2012
  - iii. Collaborate with other basin programs in the West of Hudson Watershed on development of materials
    - a. Accomplishments (2009-2010)
    - b. Work plan (2010-2012)

- iv. Provide ongoing media exposure through press releases, purchase of advertising and articles in local and county newspapers.
  - a. Accomplishments (2009-2010)
    - Press releases distributed for each event in 2009
    - Advertising purchased for Ashokan Watershed Conference
    - Article on Watershed Conference in local paper (Olive Press)
  - b. Work plan (2010-2012)
    - .Continue to refine and develop media outreach program. Increase articles submitted to papers.
- v. Continue development of website content and new pages.
  - a. Accomplishments (2009-2010)
    - New website format developed in 2009
  - b. Work plan (2010-2012)
    - Improve collaboration with Catskillstreams.org site as primary site for the overall program
    - Include more information of program successes and progress on website.

**Action Item 37.2** Participate in local events to promote the Ashokan Watershed Stream Management Program

- a. Lead Agency: CCE/SWCD
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
  - i. Participate in Olive Day, Shandaken Day and other local events.
    - a. Accomplishments (2009-2010)
      - Provided booth with Stream Table at Shandaken Day and Phoenicia Rotary Duck Race
      - Staffed the Stream Table at the Ulster County Fair
    - b. Work plan (2010-2012)
      - Continue to participate in local events
      - Groom volunteers to participate in local events to expand number of events that can be accommodated by the program
  - ii. Develop one new display per year for public events
    - a. Accomplishments (2009-2010)
      - Program Display and invasive/native plant display completed July, 2009
      - New AWSMP Program Display completed May, 2010
    - b. Work plan (2010-2012)
      - Continue to develop at least one new display per year as per contract.

**Recommendation 38: Work with the Catskill Region Invasive Species Partnership (CRISP) to address locations of early detection species in the Ashokan Basin.**

**Action Item 38.1** Attend CRISP meetings

- a. Lead Agency: CCE

- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
  - i. Designate a staff person to attend CRISP meetings and participate with CRISP
    - a. Accomplishments (2009-2010)
      - Michael Courtney designated as CRISP representative and attended CRISP meetings
    - b. Work plan (2010-2012)
      - Michael Courtney and Adam Doan will share responsibility for CRISP participation.

**Action Item 38.2** Work with West of Hudson (WoH) DEP education and outreach group to develop and disseminate outreach materials and offer public programs on Invasive Species for the West of Hudson Watersheds

- a. Lead Agency: CCE
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
  - i. Designate staff to participated in WoH education group
    - a. Accomplishments (2009-2010)
      - Staff from CCE and SWCD participate in WoH efforts
      - Staff from CCE attended DEP/Nature Conservancy training on identifying outbreaks of Asian Longhorn Beetle and European Emerald Ashborer in the Catskills.
      - Staff collaborate with DEP for disseminating recommendations around Knotweed removal
      - CCE researched Didymo cleaning protocol used in other states and shared findings with DEP and WoH program staff in other watersheds.
    - b. Work plan (2010-2012)
      - Continue to participate in WoH efforts and to coordinate outreach around key invasive species of concern.

**Recommendation 39: Work with Trout Unlimited, fishing guides, whitewater recreation, and other partners to develop a Didymo awareness program for the Watershed that emphasizes prevention of further infestation.**

**Action Item 39.1** Work with TU and DEC to disseminate information about Didymo and how to prevent it. Assess the feasibility of possible management strategies for preventing the spread of didymo in the watershed (i.e. wader cleaning stations). Provide financial assistance for outreach activities and to help implement feasible management strategies.

- a. Lead Agency: CCE
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
  - i. Place factsheets on kiosks about didymo
    - a. Accomplishments (2009-2010)
      - CCE researched Didymo prevention strategies and developed Didymo Flyer aimed at recreational users
      - Flyer distributed in Esopus Creek Newsletter
      - Laminated flyer provided to CWC and others for inclusion in Kiosks and along stream access points
      - Flyer used in CCE invasive species display at Shandaken Day and Ulster County Fair

- Participants in Rosgen training in October provided with Didymo cleaning and prevention information. Cleaning stations provided on-site for field days.
  - Cleaning stations and other prevention strategies included as a priority use of funds for Mini Grant Program
  - Mini Grant provided to SUNY Ulster summer research project to prevent transmission of Didymo and to study effectiveness of elimination strategies.
- b. Work plan (2010-2012)
- Encourage small grants for Didymo awareness and prevention projects.
  - Continue to provide outreach to partners about proper cleaning and prevention of transmission of aquatic invasive species

**Recommendation 40: Provide community education for recreational users of the Esopus Creek.**

**Action Item 40.1** Support the placement of information kiosks at common put-in and take-out locations as a means to share pertinent information about the location of in stream hazards, invasive species, safety tips and other key information.

- a. Lead Agency: CCE
- b. Planned Activities/Outcome(s) for 2010 – 2012 Ashokan Action Plan
- i. Finish and enhance Woodland Valley kiosk with additional informational materials (Summer 2009)
    - a. Accomplishments (2009-2010)
      - Kiosk completed
    - b. Work plan (2010-2012)
      - None planned
  - ii. Offer mini-grants to develop or enhance kiosks along the streams in the watershed.
    - a. Accomplishments (2009-2010)
      - Provided Mini Grant to Catskill Center for Conservation and Development
    - b. Work plan (2010-2012)
      - Continue to support mini-grants for kiosks, as appropriate.