TECHNICAL MEMORANDUM

Project Title: NPDES Phase II Community Outreach - Runoff/Phosphorus Reduction through Residential Landscape Practices 2014/2015

(GARDENING GREEN – Sustainable Landscaping)

July 31, 2015

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Acknowledgments

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STORM WATER EDUCATION/OUTREACH

Residential Low Impact Development Program

SUMMARY

Education and outreach are crucial to the success of stormwater management programs. These activities help to ensure an informed and knowledgeable community. Greater understanding of the reasons why it is necessary to manage stormwater builds public support for programs, leads to greater compliance, and encourages the public to become partners in the education and outreach of other community members.

In August of 2014 WSU Whatcom County Extension entered into a contract with Whatcom County Public Works to provide community outreach/education about residential landscaping practices. Traditional residential landscaping with large areas of lawn and few trees and shrubs are often managed with frequent irrigation and applications of chemical fertilizer and pesticides. These common practices have been identified as contributing to excess runoff and phosphorus loading to sensitive watersheds and the Puget Sound.

This educational effort provides not just awareness about stormwater issues and the resulting water quality impacts but more importantly the knowledge needed for individuals to take actions to protect or improve the quality of area waters.

- All class participants report that their knowledge about sustainable practices and the benefits to the environment have increased.

People tend to be uncomfortable taking on new behaviors. Developing self-efficacy and actual skills make it more likely that they will try new strategies to make their landscape an environmental asset.

- All class participants report that this class improved the necessary skills for planning and implementing on-the-ground changes to their landscape.

Gardening Green seeks to alter attitudes through information and affirmation. Fostering emotional engagement is an essential element of attitude change. This program utilizes shared stories and interaction with other community members demonstrating commitment to environmentally friendly gardening to protect water quality to engage students.

- Behavior, observed and reported, of both current and past program participants (2009-2014) support the conclusion that sustained changes in gardening behaviors are being achieved.
- All participants also report that they are convinced that they can have a positive impact on the environment by their landscape choices and practice.

To achieve the benefits of sustainable landscaping on water quality protection, on-the-ground changes in both the design and maintenance practices must occur. This program extends participant contact and assistance beyond the three-week class period by providing on-site consultations and follow up contacts. The intent of these visits is to increase the likelihood that changes are implemented.

- Written commitments are more effective than verbal ones, each participant signs a pledge to implement best management practices.
- All class participants report that the class influenced their commitment to take actions that protect human and environmental health and their resolve to apply the strategies learned in this class.
- Participants are motivated by the personal benefits (saves them time and money) of sustainable landscaping while it preserves natural resources for future generations.

NPDES Phase II Requirements

This project meets the public education and outreach elements of the NPDES Phase II requirements to implement a public education program to distribute educational materials to the community and conduct outreach activities about the impacts of stormwater discharges on local water bodies and the steps that can be taken to reduce stormwater pollution by residential homeowners through the adoption of best management practices for the design and maintenance of their landscape. Project activities used to achieve these goals include:

- Sustainable landscaping class, follow up consultations, and a sustainable landscape class manual;
- On-site consultations for Lake Whatcom residents participating in the Home Owner Incentive Project (HIP);
- Community outreach, including workshops and interpretive displays, at events and in public facilities highlighting sustainable landscaping practices;
- Development of an on-line web based class that can be easily accessed by the community whenever they have time.

This project satisfies elements of the NPDES Phase II Requirements for public education and outreach requirements and enables items 5-8 to be checked "yes" in the NPDES Phase II annual report. These requirements call for improvements in target audience understanding that residential property and traditional landscaping design and practices is a major contributor to fresh and marine water pollution.

- The actions undertaken by program participants demonstrates that once they are aware of the problem of stormwater's negative impact on water quality they implemented changes in their landscaping design and maintenance practices to solve this problem.

This project fulfills the NPDES II permit requirements for subject areas targeted by this scope of work. Gardening Green classes and other outreach activities are open to all Whatcom County residents. Program evaluation activities measure the understanding and adoption of targeted behaviors.

- Educating the general public about impacts of stormwater flows into surface waters, impacts from impervious surfaces, source control BMP's and environmental stewardship actions and opportunities in the area of landscaping and buffers (S.5.C.1.a.i.);
- Education and outreach for homeowners on yard care techniques protective of water quality, BMPs for use and storage of pesticides and fertilizers, and low impact development techniques including site design, pervious paving, retention of forests and mature trees (S.5.C.1.a.ii.); and
- Measuring the understanding and adoption of the targeted behaviors for at least one targeted audience in at least one subject area (S.5.C.1.c.);

PROJECT GOALS

The goals of the project are to increase community knowledge about sustainable landscaping practices, increase on-the-ground changes in landscape design and the adoption of maintenance practices that have a low impact on the environment. To expand community capacity, class participant "payback" for the education and assistance includes outreach efforts to friends, neighbors, and social groups about sustainable landscaping.

These efforts are designed to ultimately reduce water quality and quantity impacts to receiving water bodies associated with traditional residential landscaping with the following outcomes:

- Increased community knowledge about the impacts of traditional landscaping practices on receiving water bodies;

- Increased community knowledge about sustainable residential landscaping practices that can reduce water quality/quantity impacts as well as other benefits to residential property owners (cost savings, time savings, other health and environmental benefits);
- Increased number of on-the-ground landscaping best management practices being implemented;
- Knowledge about the extent to which strategies are implemented and associated outcomes achieved (program evaluation); and
- Knowledge of possible changes that may increase program success and cost effectiveness.
- Insight into the design of future outreach activities.

PROJECT DESIGN

It should be noted that there are many different definitions of sustainable landscaping. The one used for community outreach efforts associated with this project is the UN'S World Commission on Environment and Development, 1987: *"Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs."*

A sustainable landscape protects human and environmental health:

- Locate densely planted landscape beds to manage stormwater by enhancing evapotranspiration, maximizing infiltration, and eliminating or minimizing run-off.
- It is in balance with our local climate, and once established requires minimal resource inputs such as chemical fertilizer, pesticides, and water;
- It is a healthy landscape that supports birds and beneficial insects that manage plant pests;
- Builds healthy soil that supports plants and a diverse soil organisms;
- It provides benefits to the gardener through reduced maintenance, reduced costs (associated with energy, water, and fertilizer/pesticide use), and reduced risk of health impacts to people, animals, and the environment;
- It is a landscape that meets the needs of the homeowner/family; and
- It is attractive with healthy, thriving plants.

Three tasks were identified to meet the goals of the project.

TASK 1: **In Person Community Training**	**TASK 2:** **Online/Own Time Training**	**TASK 3:** **Administration & Reporting**
• *Task 1a* - Sustainable Landscape Class, Follow-up, and Other Education Outreach • *Task 1b* – Homeowner Incentive Program • *Task 1c* – Interpretive Displays • *Task 1d* - Water Week Activity • *Task 1e* – Evaluation	• Development of website materials that will allow users to access information offered in the face-to-face class on-line.	• Monthly progress reports • Provide a technical memorandum to report project goals and outcomes.

Project Partnerships support this program.

Whatcom Co.	**WSU Extension:**	**City of Bellingham:**	**Fourth Corner Nursery:**

Funding Cathy Craver	Equipment & Supplies Support Staff Sue Taylor Jill Cotton Sue Blake	Classroom space Anitra Accetturo	Wholesale native plants available to class and HIP participants

Community Partners assist with Gardening Green class activities.

Past Class Participants & Others Community Members			
Bill & Jenny Young Sue Kenney Benita Bowen Dorcie Wellman Giuliana Nasashima Lyle Anderson	Sue Taylor Dan Connick Michael Sennet Paul Woodcock Ron Quinn	Barbie Jimenez Jon & Dorene Lopez Steve & Jen Tuckerman Pam Borso Ruby Larive	Michael & Mary Jay Kate Birr Molly McGuire Marian Heyn Allen Richardson

Evaluation Methods:
- Post-class surveys self-rated changes in knowledge, skills, and commitment (class);
- Best Management Practice Pledges (class);
- On-the-Ground Changes to existing landscape design and maintenance practices (class)
- Community Knowledge Expansion: Survey questions, user observations, and participant payback community outreach activities.

PROJECT IMPLEMENTATION & OUTCOMES

TASK 1: IN PERSON COMMUNITY TRAINING AND EVALUATION

TASK 1a: Three week Class/Follow-up Activities, Education Workshops, Interpretive Displays

Class

The thirty-hour Gardening Green class was conducted from September 16 – October 2 following the framework established by the 2009-2013 classes. This class was offered to Whatcom County residents on a first come/first serve basis. Lake Whatcom watershed residents are always accepted into the class regardless of class size.

Public advertising for Gardening Green included announcements in local newspapers (daily and weekly), WSU Whatcom Extension website, North Cascades Audubon Society, Komo Kulshan Native Plant Society, Sudden Valley Community Association, and neighborhood groups. Eleven participants began the class. One dropped out when she took a new job.

Gardening Green teaches a natural approach to landscaping that builds healthy soils that can provide plant nutrition and stormwater filtering. The foundation of a sustainable landscape is regional native plants due to their adaptation to existing climate conditions, soils, their support of biologically diverse soil microbe populations, as well as the reduced need for inputs of supplemental water, chemical fertilizer, and pesticides.

All participants reported that the class influenced their resolve to take actions that will protect human

and environmental health. They also indicated their intention to apply the strategies presented in the class to their own landscape and to become partners in community outreach efforts.

Class activities designed to increase the likelihood of changes in attitude, commitment, and the resolve to adopt best management practices are as follows:

1. Class participants create a plan for redesigning their existing landscape to reduces the chance of stormwater leaving their property as run-off.
2. Students signify their commitment to change when they present their plan for on-the-ground changes to their classmates. They display their landscape plan, describe the on-the-ground changes they intend to make, and share how they will implement their plan.
3. Class participants sign a pledge to implement specific Best Management Practices for the design and maintenance of their landscapes.
4. On-site follow-up consultations address any barriers preventing the implementation of on-the-ground changes as well as guidance in the selection of plants and suggestions for mitigations that allow for family uses without impacting the goal of water quality protection.
5. Students from previous classes demonstrate long-term adoption of sustainable values by assisting with class presentations, hosting landscape tours for current class members and the greater community, and discuss their reasons for and commitment to sustainable landscaping.
6. Present and past Gardening Green participants act as partners in community outreach by sharing their knowledge, skills, and commitment of sustainable concepts and strategies.

Follow-up Consultations and Activities

On-site consultations were offered to students to encourage on-the-ground actions and foster sustained behavior change. Opportunities for improved storm water management and to find solutions for barriers to the implementation of best management practices were the focus of the visits. Guidance was also available for fulfilling their payback projects. The following list describes the type of assistance requested:

- Locating new landscape beds to capture runoff from driveways and lawns;
- Suggestions for design and plant selection for an a native landscape;
- Guidance for installing a drip irrigation system using collected storm water;
- Planting technique and plant selection for use on hillsides to control erosion;
- Selection of plants for problem areas in the landscape;
- Plant identification;
- Ideas incorporating native plants into existing mature landscapes;
- Identification and elimination of noxious weeds;
- Non-toxic management of weed infestations;
- Assistance prioritizing implementation of BMP's;
- Suggestions for mitigation and strategies to overcome a barrier to implementation of best management practices;
- Organizing four trips to Fourth Corner Nursery;
- On-site visits to past participants to tour their completed on-the-ground projects;
- Email and/or telephone contact with 23 past class participants.

Outreach to the General Public

Project staff undertook educational outreach to the general public to increase awareness and knowledge about sustainable landscaping, stormwater management, and water quality protection.

Rain Garden Workshop

Project staff developed workshop material for presentations on rain gardens.

- Workshop conducted at Deming Library in March and attended by 18 people.

Interactive Educational Displays

1. Interactive Diorama of Sustainable Practices – highlights sustainable features both inside the house and in the landscape as well as other actions individuals can take to protect water quality, conserve water usage, enhance biodiversity, conserve energy, and reduce waste.
   - County Fair in Lynden for a week in August
   - Whatcom County Extension office September - March

2. Integrated Pest Management process for reducing plant pests and diseases and managing those that do occur with a four step process: cultural, physical/mechanical, biological, and as a last resort chemical. The display features non-toxic products and methods for managing plant pests as well as information about personal and environmental risks and safe practices when using pesticides.
   - Whatcom County Extension office – April – June
   - Sustainable Living Fair - June 26

3. Interactive Child Friendly display of stormwater impacts.
   - Oysterfest – September 6 (Whatcom Water Week)

4. Rain Garden Display
   - County Fair at Lynden
   - Advanced Master Gardener Training Workshop – October 31 Workshop
   - Oysterfest – September 6 (Whatcom Water Week)

5. Three appearances on community radio talk show:
   - Water/natural resources program overview with emphasis on sustainable landscaping in April
   - Panel on water quality issues – recorded in May
   - Discussion on sustainable landscaping – recorded in June

TASK 1b: Homeowner Incentive Program (HIP) Support

Provided on-site visits to six residents to assist with the development of their HIP project areas: providing help with native plant selection, design of planting areas, procuring native plants, and information about proper planting technique and low impact maintenance techniques. Each resident was given two to three hours of consultation during one or two on-site visits.

TASK 1d: Water Weeks Event

Community outreach was offered during Whatcom Water Weeks kick-off event. Project staff manned a storm water interactive display at Bellwood Acres during the first annual Oysterfest. An interactive display demonstrated the movement of stormwater through a community as it picked up pollutants from a variety of sources. Children colored pictures of the benefits of clear water for display in the booth. Community members attended this event throughout the day.

Cistern Open House on September 10–featured several residential water collection cisterns for reuse in landscape watering at a private home.

TASK 1e: Class Evaluation

Post-class surveys self-rated changes in knowledge, skills, and commitment:

Evaluation of the project format, materials, and by class participants continues to indicate that the

class is well-received and providing participants with useful, practical tools for converting traditional landscapes to ones that are more environmentally protective.

Participants self-rated their level of knowledge and skills before and after the class. Results indicated that all participants increased their knowledge and skill levels about sustainable landscape concepts and the environmental issues associated with traditional landscape design and maintenance practices.

Table 1: Program Evaluation - Post Class Participant Survey Results

All participants reported an increase in knowledge.	• Impacts of traditional landscaping on environmental issues. • Strategies to design a landscape to manage storm water. • Relationship between healthy soil functions and water quality. • Selection of appropriate plants. • Use of regional native plants in home landscapes. • Maintenance techniques that have a low impact on the environment. • Strategies to reduce/eliminate lawns. • Integrated pest management to reduce or eliminate the use of pesticides. • Wildlife habitat design to attract nature's pest managers. • Water consumption, conservation, and rainwater harvesting.
All participants reported an increase in the skills.	• How to renovate my landscape to be more sustainable. • Drawing a basic site plan of existing conditions to scale. • Generating conceptual plans of sustainable changes to their landscape. • Creation of a master plan documenting sustainable changes. • Creation of a scaled drawing and planting plan. • Designing and installing a rainwater collection system.
Changes in levels of commitment to make sustainable changes.	• All agreed or strongly agreed that this class had influenced their resolve to take actions that would protect human and environmental health. • All agreed or strongly agreed that they intended to apply the strategies presented in this class to the design and management of their landscape. • All agreed or strongly agreed that they felt confident that they could discuss sustainable landscape concepts to friends and neighbors. • All agreed or strongly agreed that they were convinced that they could have a positive impact on environmental issues by their landscape choices and maintenance practices. • Eight of the participants agreed or strongly agreed that they would install a rainwater system. Two were undecided.

Best Management Practice Pledges

BMP pledges were used to formalize the actions students intended to take when remodeling their landscape. Written commitments increase the likelihood of follow through. The pledges were signed and one copy given back to the participant and one copy given to the program. Self-reporting, on-site visits, and follow-up contacts were utilized to determine whether the class participants did make on-the-ground changes.

Participants selected best management practices from a list of 63 practices. The BMP's were grouped into categories but most influence water quality protection. For example: Use of phosphorus-free fertilizer is listed under Low Impact Maintenance but is critical for reducing phosphorus loading of fresh water bodies like Lake Whatcom.

- They were asked to indicate which BMP's they were already doing before they took the class to create a baseline of community behavior. They were then asked to mark the BMP's they intended to implement due to the information learned during the class.
- Several participants marked both 'BEFORE' and 'AFTER' columns for certain BMP's. When asked to explain why both were marked, they said that they were inconsistent in the use of the BMP that was also mark in the 'BEFORE' column and were indicating a renewed commitment to using the BMP consistently 'AFTER' taking the class.

A follow up survey nine months after the end of the class confirms that they have followed through on the application of many of the BMP's they pledged and they remain committed to implementing all of their pledged actions over time. A respondent commented, "Would like to have more changes but doing it gradually as time, money and body allows."

Table 2: Best Management Practices Pledge – the complete toolbox of BMP's is listed in the Appendix.

Number of BMP's in each category	BMP's were divided into the following categories on the Pledge form	BMP's Used BEFORE class	Additional BMP's pledged AFTER class
17	Storm water management	45	94
8	Protect healthy soil function	32	51
6	Right plant/right place	33	46
7	Low impact lawn care	30	25
7	Water conservation	29	30
11	Low impact maintenance /Integrated Pest Management	67	50
3	Supporting Biodiversity/Habitat	14	23
4	Reduce energy consumption	15	16
63	**TOTAL COUNT**	**265**	**335**

Table 3: Survey of Participants approximately nine months after the class ended - six respondents

Do you remember the Best Management Practices actions you pledged to take?	100%
Have you implemented **most** strategies taught in the Gardening Green class?	67%
Have you implemented **some** strategies taught in the Gardening Green class?	33%
Storm water management strategies	50%
Management or protection of healthy soil	67%
Reduced Energy Consumption	67%
Appropriate plant choices for the site	67%
Conservation of water	83%
Reduction in the use of fertilizers and pesticides	50%
Reduction in lawn size	67%
Improvement of wildlife habitat through the use of native plants	67%

Participants Partnering in Community Outreach

All respondents reported that they have talked to friends, neighbors, and social groups about why they decided to make changes to their existing landscape, the negative impacts of many common practices used in traditional landscaping, and sustainable landscaping concepts and methods.

One participant has been writing monthly articles on native plants for the Master Gardener's newsletter. Another helped plan a sustainable garden for her son and two others helped friends plan

sustainable changes to their landscapes.

One of last year's Gardening Green students hosted tours of his HIP project that he planned during the Gardening Green class. He eliminated lawn, added native plants, infiltrated some rooftop stormwater and collected some rooftop storm water for reuse in the landscape in cisterns. Over 200 people visited the property during the two days of the 2015 Sustainable Connection's 'Imagine' tour.

Several other class participants have joined the Lake Whatcom Watershed Advisory Board, Cherry Point Maine Reserve committee, and neighborhood groups to continue learning and sharing the information they have on the role of home landscapes in protecting natural resources and wildlife.

TASK 2: ON-LINE/OWN TIME EDUCATION OPPORTUNITIES

There is a growing preference for on-line/own time learning opportunities (University survey results indicate 75% of people prefer to learn online or on their own time). In response to this opportunity to expand the outreach education's audience, this project has been developing web based community training program on sustainable landscaping, water quality protection, and outdoor water conservation.

The goal of the website is for users to have access to information on all of the topics covered in the Gardening Green: Sustainable Landscaping Class on-line so they can access the information at the time and speed that suits their schedules.

Local gardeners were surveyed to inform the development of a WSU Whatcom County Extension sustainable landscaping website. The website format is a mixture of slideshows, short 'how to' videos, printable bulletins, a workbook, and links to other resources. The content and formats developed for the website are being reviewed and evaluated by a focus group.

TASK 3: ADMINISTRATION/TECHNICAL MEMORANDUM

This task included completing monthly progress reports and this Technical Memorandum. The purpose of the Technical Memorandum is to describe actions taken associated with each task, the extent to which actions and outcomes were achieved, program successes, and recommendations for possible changes.

General Observations

We begin each new class by asking what the participants want to get out of the class. Nearly every student is interested in changing their landscape so that it takes less time and money to maintain. The pervasive desire for a low maintenance landscape provides an excellent cornerstone for presenting strategies to create an ecosystem garden that focuses on reestablishing natural relationships and interdependences between plants and soil. Selecting native and well-adapted plants, reducing or eliminating lawns, allowing fallen leaves and plant debris to decompose where they fall (EPA estimates that this action alone will manage about 35% more stormwater), and using maintenance strategies that have a low impact on water quality and the environment.

Komo Kulshan Native Plant Society leads the class's native plant walk at the Stimpson Family Reserve. Several students have reported that they have been regularly attending other walks and presentations on native plants offered by this local chapter as continuing education on native plants of our region.

Informing Future Outreach and/or Program Changes

Class Additions:

Many students report that their favorite outcome from adding native plants and gardening more sustainably is the large increase in birds and butterflies that their landscape renovations have attracted. Enjoyment of watching nature is a great motivator to make on-the-ground changes to existing landscapes. Therefore, we added an introductory birding presentation and walk beginning with the April 2015 class. North Cascades Audubon has volunteered to lead this workshop.

Best Management Practices Frequently Adopted

There are a number of BMP's that are readily adopted by homeowners taking the Gardening Green class. They should be somewhat reflective of the general population of property owners who garden.

Data from 2010-2014 classes indicates that most people are willing to manage stormwater with the location and composition of landscaping. Comparison of how water is managed in forested and urban environments creates a framework for managing stormwater in home landscapes. There are three avenues for gardeners to manipulate: evapotranspiration (add more layers of plant canopy), soil infiltration (plant roots and soil organisms open up channels in soil for water movement), and capturing any surface – subsurface runoff before it leaves the property (location of densely planted landscape areas).

Below are the BMP's for utilizing plants to manage stormwater and the percentage of class participants from 2010-2014 classes that implemented these strategies.

82% Maintain 3 or more layers of canopy cover in landscape beds.

71% Plant more trees including conifers.

68% Locate landscape beds or French drains to intercept runoff at the base of slopes.

56% Locate landscape beds to capture runoff from lawn areas.

54% Locate landscape beds around the property perimeter to create a final barrier to run-off.

61% Direct run-off from impervious surfaces to landscape beds with healthy soil that can infiltrate it.

85% Expand the size of densely vegetated landscape beds to reduce lawn area.

56% Create native plant buffers near all water resources.

68% Create a woodland area.

82% Reduce or eliminate your lawn.

83% Use native plants as the backbone of the landscape.

89% Create wildlife habitat for birds and beneficial insects.

Changes in maintenance practices were also very acceptable to this group of people (2010-2014).

63% Install a rain barrel or cistern for storm water reuse in landscape.

98% Maintain a woody mulch cover on all bare soil.

100% Feed the soil, not the plants. Reduce or eliminate chemical fertilizer use

90% Allow lawns to go dormant in the dry season.

94% Use smart watering techniques – water in morning, infrequently, and deeply.

95% Eliminate cosmetic use of herbicides (for appearance rather that for plant health.

93% Reduce the use of all pesticides.

80% Use only phosphorous-free fertilizer.

73% Use and dispose of pesticides according to manufacturer's directions.

Actions that required a lot of hard physical labor, hiring contractors, and considerable cost were much less frequently adopted.

35% Remove impervious surfaces & replace them with pervious ones.

42% Moderate steep slopes with terracing to allow the soil to absorb run-off and prevent erosion.

32% Put infiltration drains under paths in established landscapes or lawns for rooftop stormwater.

39% Put curves in paths that go downhill to slow rainwater runoff so it can be absorbed into the soil.

45% Install an infiltration trench, seasonal pond or rain garden to infiltrate rooftop storm water.

Anitra Accentturo added several questions to the class survey. The objective is to inform city and county staff about the most effect way to communicate code/policy information to residents.

Table 4: ***Please indicate your preferences for communicating code/policy information to residents regarding landscaping and rainwater collection.***

	YES	**NO**
Flowchart	**6**	**3**
Video available on web and BTV10	**6**	**1**
Hand-out examples of other residents' projects and permitting requirements (if any)	**8**	**1**
Scheduled deadline for code compliance	**4**	**4**
Workshops	**6**	**3**
Demonstration sites on a city block available for self-guided tour with interpretative signage (e.g. Sea Streets in Seattle, http://www2.cityofseattle.net/util/tours/seastreet/slide1.htm)	**8**	**1**
Other: You Tube chapters and sections FAQ – that gets updated and improved Handicapped requirements for outside users Does COB have a user (w/chairs, walker, canes, visually impaired, high heels) requirement committee for codes Just talking about what I'm doing at home-maybe a newletter format for neighbors		

Appendix I:

Logic Model for Project (Participants = people taking part in some aspect of this outreach project).

- **Audience:** Whatcom County Residents and Residents of the NPDES Phase II areas
- **Resources:** WSU Whatcom Extension, Whatcom County Public Works, Bellingham City Public Works, Fourth Corner Native Plant Nursery, Community Members

Outputs/Activities	Short-term Outcome	Mid-term Outcomes	Long-term Outcomes
Conduct 1 Class • Follow up • BMP Pledge • Payback projects • Continuing education activity • Organize landscape tours • On-site consultation • Hands-on activities & demonstrations • Develop curriculum materials Community Workshops: • Audubon Society • Master Gardener Training Conduct 2 short workshops for Whatcom Water Weeks Provide support for the HIP program Video of landscape make-over for WEB Provide information on mulches, choosing plants/natives, and Integrated Pest Management for the WEB site Follow-up assistance for community payback activities & landscape changes Develop educational displays on IPM and Healthy Soils Diorama-public display in at least 3 locations Evaluate program outcomes Prepare Technical Memorandum	1 -Participants will increase their knowledge about water quality & the link to gardening activities 2 - Participants will understand the components of a sustainable landscape & it's benefits to them and environmental protection 3 - Participants will understand strategies to manage storm water on their property 4-Participants will increase knowledge about water conservation and rainwater harvesting 5 –Participants will believe that their individual actions can have a positive impact on local environmental issues 6 - Participants will feel confident about their understanding watershed issues and the role of gardening to protect water quality 7 - Increase awareness, knowledge and interest in sustainable landscaping in the general public 8 – HIP participants will develop a planting plan using native plants 9 – General public will easily access information about mulches, choosing plants/natives and IPM on the website and through educational displays at community events. 10 – Complete program evaluations	1 - Participants will implement on-the- ground changes in their landscape to manage storm water, to reduce runoff, practice low impact maintenance, use native & well adapted plants 2 -Participants, as early adopters, demonstrate that this approach to landscaping can be attractive, functional & meet environmental goals to neighbors 3 -Participant interaction will encourage and foster commitment to complete their landscape changes and sustain new behaviors 4 - Participants will conduct community outreach with a goal of 150 contacts 5 – Lake Whatcom watershed residents will complete HIP landscape changes 6 – General public will utilize information presented about mulches, choosing plants/natives, and IPM in home landscapes 7 - The information gathered in this project will increase the effectiveness of outreach educational efforts 8 – BMP pledges will identify existing practices, intended new practices, and actual on-the-ground changes	Participants' actions will promote watershed stewardship activities in neighbors Participants outreach efforts will contribute to a change the current social norms about the 'ideal' landscape with large lawns to sustainable landscapes that require minimal inputs & protect the environment Lake Whatcom water quality will improve as phosphorus loading decreases Policy makers will support continued outreach education to enhance stewardship of the watershed

APPENDIX II: Program Evaluations

WSU Whatcom Extension – Whatcom County

GARDENING GREEN: Sustainable Landscaping September 2014

Please complete the program evaluation below to help us gage the effectiveness of the presenters, format, information, and experiences provided by this class. Your feedback assists the development and implementation of future classes. Thank you!

Where did you hear about this class?

Friend/Neighbor 3 Master Gardener Listserve 2 Looked into class few years ago – maybe Master Gardeners 1 Email announcement 1 WSU Whatcom Extension Website 1 Son 1

1) Class FORMAT: Mark the most appropriate response (# of participants selecting the response)

	1	2	3	4	5
Presentation materials (power points, demonstrations, handouts, hands-on activities)	Distracted from understanding				Enhanced Understanding 10
Class manual and CD			Haven't read yet	1	9
The presenters communicated concepts and ideas	Poorly				Very well 10
The pace of the class was	Too slow		Just Right 7	1	Too fast 2
The lectures, tours, and activities were well coordinated and enhance understanding	Strongly disagree		1		Strongly agree 9
I would recommend this class to others	Strongly disagree				Strongly agree 10

2) Rate your level of KNOWLEDGE change.

Use a percentage rating between 0% (no knowledge of topic) and 100% (complete knowledge of topic). ***Prior to taking this Class is listed first - After taking this Class is listed last.***									
The link between gardening practices and human / environmental health issues.									
50-80%	70-90%	90-100%	20-80%	50-80%	60-80%	10-80%	85-90%	85-95%	
The benefits the gardener gains by adopting a naturally sustainable approach to gardening.									
40-80%	70-90%	90-100%	20-80%	50-80%	60-80%	5-100%	90-95%	85-95%	
The benefits to the environment from a sustainable approach to gardening.									
40-80%	70-90%	90-100%	20-80%	50-90%	40-90%	0-100%	100-100%	85-95%	
The environmentally informed landscape strategies for storm water management, climate change, etc.									
20-70%	50-100%	90-100%	20-80%	50-70%	20-90%	15-80%	90-95%	50-75%	

The function of healthy soil to water quality and plant health.									
50-80%	89-90%	90-100%	40-80%	50-70%	20-90%	10-90%	80-85%	85-95%	
The selection of plants that is appropriate to their location for plant health and less maintenance.									
50-80%	90-100%	90-100%	50-80%	50-80%	60-80%	70-95%	85-85%%	60-80%	
Use of regionally native plants in the home landscape.									
10-70%	70-100%	90-100%	70-80%	50-100%	60-90%	20-95%	100-100%	90-95%	
Use of low impact maintenance strategies: grouping plants by need, mulching, smart watering, etc.									
50-80%	90-100%	90-100%	40-80%	50-100%	60-90%	0-95%	100-100%	80-90%	
Strategies to reduce/eliminate lawns and landscaping options for lawn alternatives.									
40-100%	70-100%	80-100%	70-80%	50-100%	90-90%	0-90%	100-100%	80-90%	
Integrated pest management step-by-step methods to management pests using the least toxic means.									
20-60%	60-80%	80-88%	40-80%	50-70%	20-90%	5-80%	100-100%	80-90%	
Creating wildlife habitat and supporting biodiversity in plants, animals and beneficial insects.									
40-100%	80-100%	90-100%	40-80%	50-90%	60-90%	70-90%	80-95%	95-95%	
Water consumption, conservation, and quality: rainwater harvesting.									
10-70%	70-100%	90-100%	20-80%	NA	20-90%	0-80%	60-80%	85-95%	

3) Rate the change of your SKILLS as a result of the hands-on activities and landscape tours.

Use a percentage rating between 0% (no knowledge of topic) and 100% (complete knowledge of topic) ***Prior to taking this Class is listed first - After taking this Class is listed last.***									
The landscape tours stimulated ideas for how to renovate my landscape to be more sustainable.									
20-90%	50-90%	80-90%	NA	0-60%	50-70%	0-100%	70-90%	85-98%	
Drawing a basic site plan showing existing conditions.									
0-70%	50-90%	60-70%	30-80%	0-60%	0-100%	70-90%	70-90%	80-95%	
Performing a site analysis.									
30-90%	50-100%	60-70%	30-50%	0-60%	0-90%	70-90%	80-90%	80-95%	
Generating and evaluating conceptual plans of possible sustainable site design changes.									
0-100%	50-90%	75-80%	40-80%	0-60%	0-100%	70-90%	80-90%	80-95%	

Creating a scaled drawing and planting plan for individual landscape beds.

0-80%	50-90%	75-75%	40-80%	0-60%	0-100%	20-95%	40-90%	90-95%	

Designing and installing a rainwater collection system.

0-60%	50-90%	75-80%	40-80%	0-60%	0-90%	0-60%	70-90%	90-95%	

4) Rate your level of COMMITMENT: ***Total number of participants selecting the answer.***

Mark the most appropriate response	Strongly disagree **1**	Disagree **2**	Undecided **3**	Agree **4**	Strongly agree **5**
This class has influenced my resolve to take actions that will protect human and environmental health.					**10**
I intend to apply the strategies presented in this class to the design and management of my landscape.					**10**
I am confident that I can discuss sustainable landscape concepts to friends and neighbors.				**1**	**9**
I am convinced that I can positively impact environmental issues by my landscape choices and maintenance practices.				**1**	**9**
I intend to install a rainwater system at my home.			**2**	**1**	**7**

5) Please circle your preferences for communicating code/policy information to residents regarding landscaping and rainwater collection.

	YES	**NO**
Flowchart	**6**	**3**
Video available on web and BTV10	**6**	**1**
Hand-out examples of other residents' projects and permitting requirements (if any)	**8**	**1**
Scheduled deadline for code compliance	**4**	**4**
Workshops	**6**	**3**
Demonstration sites on a city block available for self-guided tour with interpretative signage (e.g. Sea Streets in Seattle, http://www2.cityofseattle.net/util/tours/seastreet/slide1.htm)	**8**	**1**
Other: You Tube chapters and sections FAQ – that gets updated and improved Handicapped requirements for outside users Does COB have a user (w/chairs, walker, canes, visually impaired, high heels) requirement committee for codes Just talking about what I'm doing at home-maybe a newletter format for neighbors		

6) Rate your opinion on the FEE for this class: ***Mark the most appropriate response***

	YES	**MAYBE**	**NO**
Should a fee be charged for this class?			**8**
If a fee is charged, how much would be appropriate	**$50 -$75 - $75**		
Do you think a fee for the class would prevent others you know from attending.	**8**	**1**	

APPENDIX III: 2014 Class Best Management Practices

SEPTEMBER 2014 GARDENING GREEN: Best Management Practices Pledges

ALREADY DID	NEW PLEDGES	
		STORM WATER MANAGEMENT
3	**9**	Maintain 3 or more layers of canopy cover in landscape beds.
7	**4**	Plant more trees including conifers.
3	**7**	Locate landscape beds or French drains to intercept runoff at the base of slopes.
1	**5**	Locate landscape beds to capture runoff from lawn areas.
0	**5**	Locate landscape beds (can be on mounded soil) around the property perimeter to create a final barrier to run-off.
2	**7**	Direct run-off from impervious surfaces to densely vegetated landscape beds with healthy soil that can infiltrate it.
1	**2**	Remove impervious surfaces & replace them with pervious ones.
2	**4**	Moderate steep slopes with terracing to slow down run-off & allow the soil to absorb it & prevent erosion.
0	**2**	Put French drains under your paths, especially in established landscapes or lawns to enhance infiltration.
1	**2**	Put curves in paths that go downhill to slow rainwater runoff so it can be absorbed into the soil.
5	**8**	Expand the size of densely vegetated landscape beds to reduce lawn area.
3	**7**	Create native plant buffers near all water resources.
6	**8**	Create a woodland area.
2	**6**	Infiltrate run-off from vegetable gardens, covered compost piles & dog kennels to capture nutrients in run-off.
2	**3**	Install a dry well, dispersion trench, French drain, seasonal pond or rain garden to infiltrate rooftop storm water.
5	**8**	Reduce or eliminate your lawn.
2	**7**	Install a rain barrel or cistern for storm water reuse in landscape.
45	**94**	Subtotal
		PROTECT HEALTHY SOIL FUNCTION
6	**5**	Compost yard wastes for reuse on landscape beds.
3	**9**	Mimic nature by leaving plant litter where it falls for self-sustaining soil health in permanent landscape beds.
4	**8**	Top-dress soil with compost covered by woody mulch to improve soil function.
2	**4**	Till in 2-3" compost (depth of 8") in areas of *severely damaged* soil from compaction
1	**2**	Inoculate native plant beds with mycorrhizae.
5	**9**	Maintain a woody mulch cover on all landscape beds to protect soil.
4	**8**	Create pervious paths that are separate from planting areas even through lawn areas to prevent soil compaction.

7	6	Feed the soil, not the plants. Reduce/eliminate fertilizer use.

32 51 Subtotal

RIGHT PLANT / RIGHT PLACE / RIGHT TECHIQUES

5	8	Group plants by sun exposure and watering needs to reduce plant stress & maintenance.
4	8	Use native plants as the backbone of the landscape.
5	6	Inspect plants for diseases, pests, & root problems before purchase.
6	9	Use the right planting techniques.
8	8	Select plants adapted to your climatic zone for hardiness.
5	7	Plan for mature size of plants to reduce pruning.

33 46 Subtotal

LOW IMPACT LAWN CARE

1	2	Establish pathways through lawn areas to reduce soil compaction.
10	6	Allow lawns to go dormant in the dry season.
0	2	Use eco-lawn as turf alternative.
3	2	Use only phosphorus-free fertilizer.
8	6	Hand weed lawn or tolerate a few weeds (no weed & feed).
2	3	Aerate compacted lawns & add a little compost.
6	4	Limit lawn watering to 1" per week including rainwater or less

30 25 Subtotal

WATER CONSERVATION

4	2	Separate lawn irrigation system from irrigation for trees and shrubs, which need much less frequent watering.
7	6	Use smart watering techniques – water in the mornings, water deeply and infrequently to encourage root growth.
3	6	Use drip irrigation to water only landscape plants not weeds.
4	1	Use soaker hoses instead of overhead sprinklers.
5	6	Plant drought tolerant plants.
2	0	Inspect automatic irrigation systems for leaks and adjust sprinkler head direction each monthly. Use a moisture
0	0	sensor rather than a timer to operate the system.
3	9	Reduce need for irrigation by using 3" of mulch and planting 3 or more layers of canopy cover in all landscape beds.

28 30 Subtotal

LOW IMPACT MAINTENANCE & INTEGRATED PEST MANAGEMENT

8	5	Eliminate the use of cosmetic pesticides such as herbicides used for appearance not plant needs.
8	5	Reduce the use of all pesticides. Select pest and disease resistant native or plants that are well adapted to region.
6	4	Do not fertilize woody plants unless they have been diagnosed as deficient. Use phosphorus-free fertilizer.
5	5	Regularly monitor landscape for pests. Hand pick while infestations are small.
6	4	Have pests & diseases correctly identified by Master Gardeners at WSU Extension.

6	5	Only use slug bait that is safe for pets & wildlife.
7	4	Practice tolerance for minor infestations that cover less than 30% of the plant.
5	5	Manage not control of pests and diseases. Practice I.P.M.
5	4	Remove diseased plants (Clean Green) rather than using pesticides.
4	4	Pay attention to "signal words" on pesticides. Use and dispose of according to manufacturer's directions.
7	5	Hand weed and mulch to reduce weed seed germination.

67 **50** Subtotal

SUPPORT BIODIVERSITY

3	9	Create a wildlife habitat sanctuary to address the decline in bird, amphibian, and beneficial insect species.
5	7	Grow a species rich landscape of regional native plants to address the loss of local flora.
6	7	Do not grow noxious weeds or aggressive exotic plants that can escape and crowd out native species.

14 **23** Subtotal

REDUCE ENERGY CONSUMPTION

7	4	Use hand tools or electric power tools whenever possible and reduce use of gas powered equipment.
3	2	Use motion detectors to activate outdoor lights rather than timers.
3	6	Plant buffers to block northeast winds in the winter to lower heating needs.
2	4	Plant deciduous shade trees on the south & west sides to cool the house & impervious surfaces.

15 **16** Subtotal

265 Total BMP's used before taking class

335 Total NEW BMP's pledged due to information learned in class

APPENDIX IV: Class List

GARDENING GREEN: Sustainable Landscaping

SEPTEMBER 2014

NAME	ADDRESS	PHONE	EMAIL
Macarena Uribe	3075 Ferry Ave D303	360-298 4468.	macauribe@gmail.com
Paula Reed	2924 Birchwood Ave	206-227-1308	paula7reed@gmail.com
Karen Gantenbein	3135 Tanglewood Lane	650-2475	grovegant7@gmail.com
Shelley Halle	951 Queen St., Bellingham	360-778-3755	Shelley_Halle@comcast.net
Michele Kammerer	5461 Noon Rd, Bellingham	360-393-2121	michele@gendersanity.com
Suneeta Eisenberg	129 S 42nd St., Bellingham	3607398703	sunilara02@hotmail.com
Charly Moore	POB 5011-PMB248	360-510-2996	CharlyMoore@live.com
Ayesha Brookshier	2810 Kulshan St, Bellingham	971-404-6326	em_lekker@hotmail.com
Barbara Davidson	806 17th St., Bellingham	734-8782	b_davidson33@hotmail.com
Derrick Montieth	8607 Silver Lake Rd., Maple Falls	599-9875	c.d.monteith@att.net
Marian Volpe	1408 Victor Street	360-715-1337	merriumvolpe@gmail.com
Sue Blake	sgblake@wsu.edu	360-676-6736	WSU Whatcom Extension
Anitra Accetturo	Aaccetturo@cob.org	360-778-7732	City of Bellingham
Sue Taylor	sl-taylor@comcast.net	360-671-3891	Project Coordinator
Jill Cotton	jillcotton@wsu.edu	360-676-6736	Project Staff

APPENDIX V: Class Schedule GARDENING GREEN September 2014: 2221 Pacific Street 9:00-2:00

BRING TO CLASS	Presentations and Tours	HOMEWORK
Tuesday-Sept 16	Class orientation	**Design Development Activities:**
Food & Drinks	**Gardening Green-Sue Taylor**	1. Basic Site - Map Your Yard
Camera	**Link Gardening/Water Quality - Sue Blake**	2. Evaluate You Yard
Walking Shoes	Landscape Design Process: Step 1 Basic Site Plan	3. Take a Photo Inventory
	Google Sketch-up - Steve Tuckerman	
	TOURS	
	Stimpson Family Reserve - Guided Walk	
	Geneva Neighborhood Walk - Stormwaterr Management	
Thursday-Sept18	**Environmentally Informed Design - Sue T**	**Continue with Design**
Food & Drinks	**Soil - Chris Benedict**	**Development**
Camera	TOURS	
Soil Sample-quart bag	Ruby- no lawn, mostly natives, storm water infiltration	
Quart Jar	Michael/Mary-cistern, pervious deck, small lawn	
Tuesday-Sept 23	**Right Plant/Right Place/Right Technique - Jill Cotton**	Do a Site Analysis of Conditions
Food & Drinks	**Rainwater Harvesting & Water Conservation - Anitra Accenturo**	
Camera	TOURS	Select Best Management Practices
	Jenny & Bill - Hydrology Activity; Cisterns, rain garden, no lawn	you intend to adopt
	Dan's-hand drawn plans, cisterns, 60% native plants, small lawn	
Thursday-Sept25	**Low Impact Maintenance Techniques - Jill**	Develop 3 Schematic Plans
Food & Drinks	**Lawn Alternatives - Sue T**	
Camera	Schematic Plan Activity	
	TOURS	
	Benita & Dorcie - Food not Lawns	
	Sue K - Garden rooms, fitting trees in the landscape	
Tuesday-Sept30	**Composting - Beth Chisholm**	Create your Master Plan for changes
Food & Drinks	**Landscaping with Native Plants - Sue T**	
Camera	Developing a Planting Plan	Work on the Planting Plan for one area
	TOURS	
Bring a copy of your	Barbie- Small lot, pervious walks, cisterns, food, family uses	
BMP list & pay-back	Kim R - Backyard habitat, rain garden	
plan	Sue T-Native plants, wildlife habitat, dispersion trenches	
Thursday-Oct 2	**Integrated Pest Management - Jill**	Enjoy your outdoor oasis!
Bring your master plan	**Creating Wildlife Habitat - Sue T**	
to share	Students Share their plans for sustainable landscape changes	