

TECHNICAL MEMORANDUM

**Project Title: NPDES Phase II Community Outreach -
Runoff/Phosphorus Reduction through Residential
Landscape Practices 2015 - 2016**

(GARDENING GREEN – Sustainable Landscaping)

May 31, 2016

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STORM WATER EDUCATION/OUTREACH

Residential Low Impact Development Program

BACKGROUND

Education and outreach are crucial to the success of storm water management programs. These activities help to ensure an informed and knowledgeable community. Greater understanding of the reasons why it is necessary to manage storm water 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 2015 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 one of the activities contributing to excess runoff and phosphorus/nitrogen loading to sensitive watersheds throughout Whatcom County including Lake Whatcom and the Puget Sound. This community outreach effort (*Gardening Green*) moves residents through a continuum from basic awareness to implementation of on-the-ground changes to becoming partners in outreach education.

There are many actions that individuals can take to reduce these impacts while saving time, money and protecting human and environmental health. *Gardening Green* educates participants on soil management, storm water management, appropriate plant selection and planting technique, native plants, maintenance techniques for low environmental impact, storm water management, water conservation/rainwater harvesting, and integrated pest management. Class participants plan the sustainable changes they intend to make to their property as a part of the curriculum. At the end of the class they have completed a written Best Management Practices (BMP's) Pledge for landscape design and low impact maintenance practices. They develop a scaled drawing of their property detailing landscape changes.

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 storm water discharges on local water bodies and the steps that can be taken to reduce storm water 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 requirements include:

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 storm water'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 storm water 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 goal of this project is to reduce water quality and quantity impacts to receiving water bodies associated with traditional residential landscaping.

The objectives of the project are:

- Increased community knowledge about negative impacts to receiving water bodies associated with traditional landscaping practices.
- Increased community knowledge of the benefits sustainable landscaping practices (best management practices) have on water quality and quantity issues.
- Increased participants' skills to implement on-the-ground changes in home landscapes.
- To foster sustained behavior change and long-term commitment to environmentally sustainable landscape practices.
- Gather information about the extent to which strategies are implemented and associated outcomes achieved (program evaluation).
- Determine possible program changes that may increase program success and cost effectiveness.
- Develop insight into the design of future outreach activities.

PROJECT DESIGN

Summary of Project's Critical Strategies

1. **Develop Awareness** of water quality and quantity issues associated with many traditional or common landscaping practices and that the same actions that address these problems offer benefits to the residential property owners including cost savings, time savings, other health and environmental benefits.
2. **Increase in Knowledge** – Each class session focuses on an essential element of sustainable landscaping. The classroom presentations and supporting written information (class manual) take participants through the steps of planning and the skills for implementing environmentally friendly changes in their landscape.
3. **Applied Learning** – Class tours of home landscapes utilizing the strategies discussed provide practical examples of how other homeowners have implemented BMP's. The landscapes selected for the tour are of different sizes and styles to reinforce the concept that BMP's can be applied to all types of residential sites. Tour hosts tell their story – why they put out the effort to make sustainable changes and the methods they used to achieve it.

4. **Facilitated Action** –Class participants make on-the-ground changes to their landscapes that protect water quality. They complete ‘homework’ assignments to incorporate the strategies discussed into their own Landscape Master Plan. By the end of the class, participants have developed a plan and have signed a Pledge indicating which BMP’s they intend to implement.
5. **Sustained Independent Action** – To expand community capacity, class participant “payback” for the education and assistance includes outreach efforts to friends, neighbors, and social groups about sustainable landscaping strategies.

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. Our community partner, Fourth Corner Native Plant Nursery, allows class participants to purchase plants at wholesale prices. Five nursery visits with the class instructors present are scheduled at the end of each class and two additional dates in the Fall and two in early Spring. Participant can also make appointments for nursery visits independently. The intent of these actions is to increase the likelihood that changes are implemented.

This project seeks to alter attitudes as well as practices to foster sustained behavior change. Sustainable landscape practices provide personal benefits to the gardener. Past participants report that they were galvanized by the positive energy of being part of a group endeavor to become more effective environmental stewards. To foster emotional engagement and commitment, participants interact with other community members who provide landscape tours. These community partners tell their stories of commitment to stewardship, positive feelings about being part of the solution, and show how they implemented BMP’s in their landscape.

- Gardening Green seeks to alter attitudes through encouragement and affirmation. Participants share their landscape plans to the rest of the class. It is an interactive activity and the presenter receives encouragement and support from fellow class members.
- Participants leave the class with a toolbox of strategies to increase their gardening success and reduce on-going maintenance.
- To break down the barriers to adopting new behaviors and strengthen confidence, participants receive training in skills necessary for planning and implementing on-the-ground changes to their landscape.

Evaluation Design

Evaluation is an essential component of the success of this educational outreach project. Participant input is used to improve project design, activities, and implementation.

- Post-class survey - Self-rated changes in knowledge, skills, and commitment before vs. after taking the class.
- Best Management Practice Pledge - Provides information commonly used BMP’s before and after this educational effort.
- On-the-Ground Changes - On-site visits and self-reporting through email, phone and other contacts.
- Community Knowledge Expansion - Survey questions about face to face community outreach activities.

PROJECT IMPLEMENTATION: Sustainable Landscape Class and Follow-up**Deliverables:**

1. One six-session landscaping class in Spring 2015. The thirty-hour Gardening Green class was conducted from September 22 – October 8. 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. Sixteen participants (including couples) began the class. One person experienced a medical problem and missed the last week of class.
2. Follow up consultations with participants and outreach to the general public.
3. Project coordination activities.
4. Sustainable landscape manual for class participants including a CD of additional information.
5. Final report compiling learning objectives, evaluations, and attendance.

Table 1: Program Partners

AGENCY	LOCAL BUSINESS	COMMUNITY
Funding: Whatcom County Public Works	Fourth Corner Native Plant Nursery: Opens wholesale nursery to class participants to purchase native plants at reduced cost.	Komo-Kulshan Native Plant Society: Leads guided native plant identification walk.
Staff and Supplies: WSU Extension		North Cascades Audubon Society: Provides introduction to birding class.
Staff and Classroom Space: Bellingham Public Works		Past class participants and other community members: host landscape tours and demonstrate cistern and drip irrigation installation.

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.

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.

Administration/Technical Memorandum

Project Staff provided monthly progress reports and this Technical Memorandum describing actions taken associated with this project, the extent to which actions and outcomes were achieved, program successes, and recommendations for possible changes to improve project outcomes. Additional input from participants focused on preferred communication methods for receiving information about code/policy related to landscaping and rainwater collection.

PROJECT EVALUATION & OUTCOMES

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.

Increase In Knowledge Necessary To Design, Implement, and Maintain A Sustainable Landscape:

- All participants reported an increase in knowledge in the impacts of traditional landscaping practices and the benefits for both human and environmental health from adopting sustainable practices.
- One of the largest topics for growth in knowledge, was the use of an environmentally informed landscape strategies to address storm water. One half of the class participants reported knowing few little or nothing about this topic prior to this class.
- Participants reported an increase in knowledge about healthy soil management, selecting appropriate plants that are disease resistant and drought tolerant, native plants, creating wildlife habitat and options and methods for lawn reduction or elimination.
- Participants reported increased knowledge about utilizing Integrated Pest Management, a common sense process for managing the landscape. They learned about maintenance techniques that have low impact on the environment. Pesticide use is recommended only as a last resort after cultural, mechanical, and biological methods have failed. And only if the plant is highly valued by the homeowner.

Development Of Skills Needed To Design A Sustainable Landscape:

All participants reported an increase in the skills needed to plan and design a sustainable landscape. The class's, *Sustainable Landscape Workbook*, provided written step-by-step instructions to supplement class discussions, activities, and demonstrations.

Participants demonstrated that they had mastered the skills to draw a site plan, conduct a site analysis, generate several schematic plans, and create scaled drawings on the last class day when they shared their plans with the class.

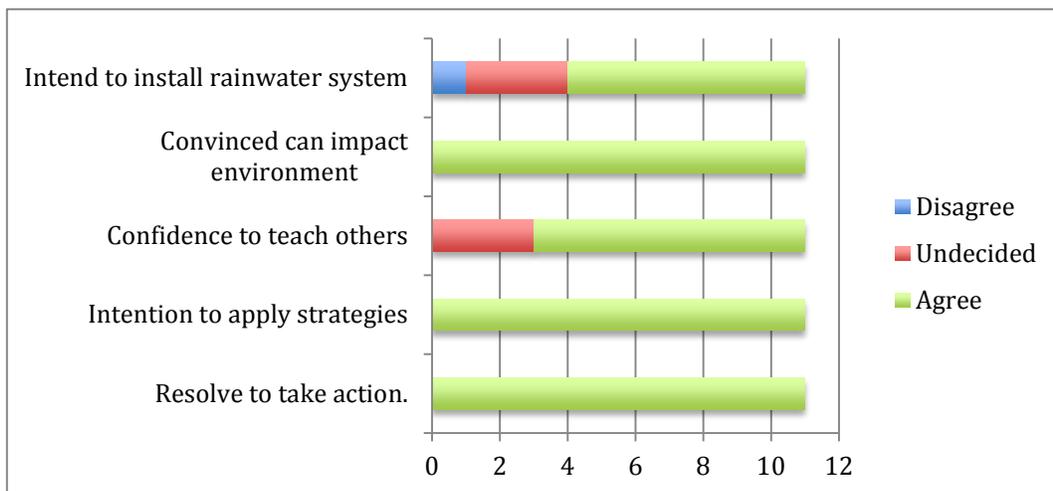
Most participants reported that they would be able to design and install a rainwater collection system.

Increases in Commitment And Resolve:

Many class activities are designed to increase commitment and the resolve to not only implement BMP's but to reinforce sustained independent actions to become partners in outreach about sustainable practices to protect water quality.

- *Program Staff* provide on-site consultations addressing any barriers, guidance in the selection of plants, and suggestions for mitigations that allow for family uses without impacting the goal of water quality protection.
- *Present and past participants* act as partners in community outreach by sharing their knowledge, skills, and commitment of sustainable concepts and strategies to family, friends, and neighbors.
- *Participants* leave the class with a master plan of sustainable changes to their existing landscape that they have invest a lot of time and thought in creating increasing the likelihood of it being implemented.
- *Participants* make a public statement about their commitment to change when they present their plan 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.
- *Participants* sign a pledge to implement specific Best Management Practices for the design and maintenance of their landscapes.
- *Past Participants* demonstrate long-term adoption of sustainable values by assisting with class presentations, hosting landscape tours for the current class, and sharing their reasons for and commitment to sustainable landscaping.

Table 2: Changes in levels of commitment to make sustainable changes



Participant’s Pledged Education Outreach Plans:

- Create a shared habitat and food garden.
- Host a garden party for neighbors to show landscape/share my changes
- Help 3 friends plan sustainable design changes to landscape
- Share my landscape with future classes
- Share information with friends and neighbors.
- My plan is to educate others by showing and teaching principles of the Gardening Green class.
- To use native plants and permaculture to protect soil structure while providing native fauna with habitat.
- To create multi layered canopies using IPM and other sustainable options that have an impact.
- Hands on help volunteering, showing and telling.
- Various practices related to sustainability: on-site events and workshops/ website with blog/organic farm with aquaponics.
- Still looking into local volunteer opportunities. Perhaps 'The Garden Project' or COB parks. Suggestions accepted.
- Eliminate lawn – little by little. And show my friends and neighbors how to do it.
- To be an example in my neighborhood by making my front yard more sustainable, and sharing it with future classes.
- To create a blog sharing our journey throughout the gardening green class but also through our personal journey of changing our landscape for the better.
- Assisting Ava with her blog and shooting short videos of any home owners who have take the program for the blog.
- To change my own yard to include native plants and sustainable practices they can implement not in place.
- Reduce grass, and follow sustainable landscape practices.
- Talk w/ neighbors and friends about this class.

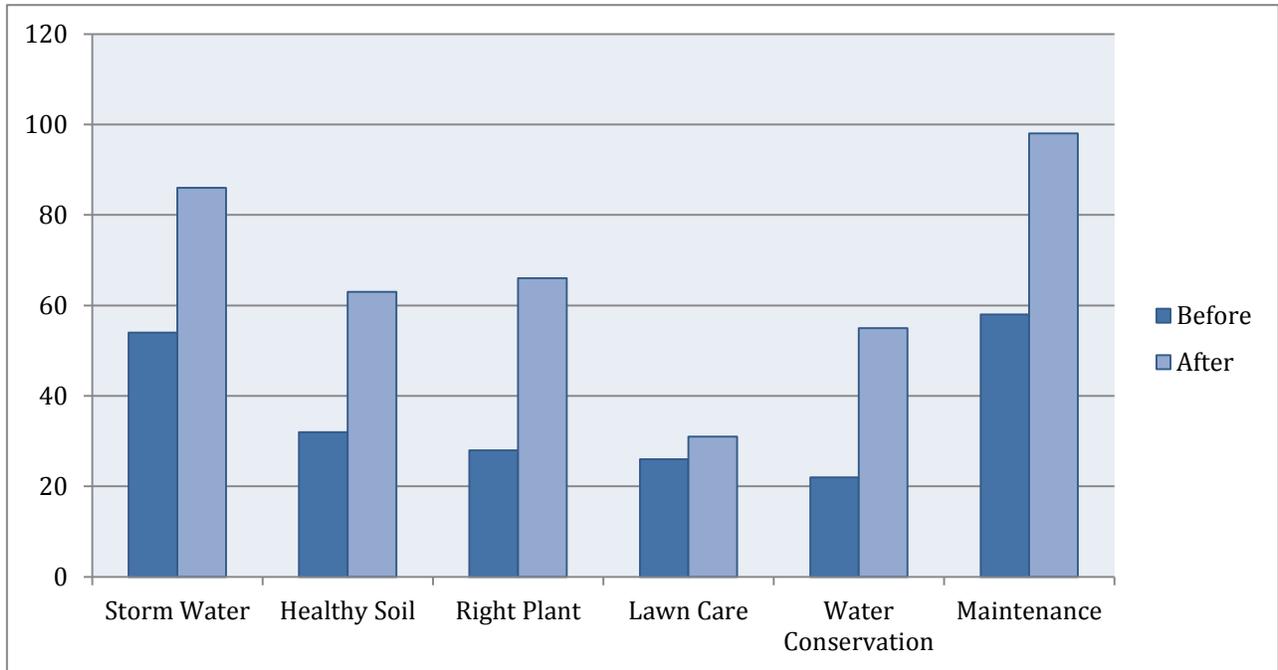
Best Management Practice Pledges

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. The complete toolbox of BMP's is listed in the Appendix.

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.

Table 4: Best Management Practices Pledge – Baseline of BMP Use Prior To This Class Compared To BMP's Pledged To Implement After The Class.



Participants written comments on the BMP pledge:

1. I don't water lawn.
2. Getting rid of all lawn!
3. No lawns.
4. We don't have a lawn.
5. I am going to take action to capture runoff – I just don't know what yet. Need to think about overall plan.
6. My plan is to eliminate lawn.
7. In the past I have hand watered and plan to do that in the future. If I need to do more the first couple of years, will install a drip system which I have used before!
8. Have not used (slug bait) in the past and may continue to not use in future.

Follow up Survey

A follow up survey six 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.

Table 5: Survey of Participants approximately eight months after the class ended – eight respondents.

Question	Response Percentage	Response Count
Do you remember the BMPs actions you pledged to take at the end of the Gardening Green class?		
• Yes	62.5%	5
• No	0.00%	0
• Somewhat	37.5%	3

<p>If you answered yes or somewhat to the previous question, how many of these actions have you put into practice?</p> <ul style="list-style-type: none"> • None • Some • Most • All 	<p>0.00%</p> <p>87.5%</p> <p>12.5%</p>	<p>0</p> <p>7</p> <p>1</p>
<p>Have you used any of the strategies taught in the Gardening Green class for (choose as many as applicable)?</p> <ul style="list-style-type: none"> • Storm water management • Management or protection of healthy soil • Reduced energy consumption • Appropriate plant choices for the site • Conservation of water • Reduction in use of fertilizers and other chemicals • Reduction of lawn size • Improvement of wildlife habitat through the use of native plants • Other – Reduction in lawn size awaits further efforts; More trees, shrubs and canopy layers 	<p>28.57%</p> <p>71.43%</p> <p>71.43%</p> <p>71.43%</p> <p>85.71%</p> <p>100%</p> <p>28.57%</p> <p>85.71%</p>	<p>2</p> <p>5</p> <p>5</p> <p>5</p> <p>6</p> <p>8</p> <p>2</p> <p>6</p>
<p>Have you shared any of the information you gained in the class with others?</p> <ul style="list-style-type: none"> • Yes <ul style="list-style-type: none"> 1. Over 25 people, including neighbors, friends, and classmates. Also on Facebook. 2. 6 3. At least 10 4. 2-3 5. Over and dozen family and friends and soon the whole world! 6. A handful of friends and neighbors with intension to do more. 7. 15 8. Have a Green Garden party later in the summer with all my neighbors and WSU speaker • No 	<p>87.50%</p> <p>12.50%</p>	<p>7</p> <p>1</p>
<p>If you did not make any changes to your gardening practices after completing the Gardening Green class, please tell us why not.</p> <ol style="list-style-type: none"> 1. Family emergency occurred. I have had to spend the last six months approx.. in California dealing with these matters. 2. We're still building our house so may of the things we want to do can't be done yet. However, we do have some of the things listed in 3 above in place(eg. Heeling in native plants purchased for later landscaping. 3. Just bought a house with 1/3 acre 2 weeks ago! Have been cutting out blackberries and scheming. Will be "going native" for sure. Hope to minimize watering tool 4. Stormwater management is the only thing I feel helpless about. I live in Sudden Valley so I do not have the benefit of the watershed program to help with cost and design and our lack of infrastructure makes individual management of stormwater impossible. 5. NA 		
<p>If you initiated any of the gardening practices discussed in class, did you find that you needed additional information not taught in class or provided in your notebook or CD?</p> <p style="text-align: right;">7 Responses</p> <ol style="list-style-type: none"> 1. No 2. No 3. No 4. Not so far 5. I used the notebook for my only questions so far. 6. For native plant choices I checked out a lot of books from the library because of my site specific issues – so shady. 7. I am needing additional soil to fill in where I am terracing. Commercial topsoil has too much sand in it. I'm not 		

sure what to do.	
Do you have any suggestions as to how the GG class can be improved?	6 Responses
<ol style="list-style-type: none"> 1. It would be nice to have more than one allotted visit from instructors to discuss developments/changes being considered for home landscaping modifications – at least for me. It takes some thinking, talking, processing, getting feedback, planning – before taking action. Being able to have a second visit would be nice – to check in, ask questions, look at progress midway, and then adjust if needed – just provides more support when you get stuck. Finding out that one visit is typically allotted was a bit of a hindrance for me. Need to figure out how to break it down in increments. Not everyone needs this. 2. Offer more classes. Offer classes quarterly. 3. No, it was great! 4. I think the Gardening Green class could be improved with more visuals during presentations and interactive discussions since so many different people have so many different site issues. 5. Not really, it was such an informative and fun class. 6. It was such a great class and the instructors were great. It covered so much ground I can't think of anything else to improve it! Thank you! 	
Do you have any additional comments or reviews you would like to share with us?	5 Responses
<ol style="list-style-type: none"> 1. The site visits in class were great - to see the different stages and different income levels of projects being implemented by former grads. Resource info was great to have for wood chips, rolls of cardboard to put down to cover lawn, etc. Life intervened this past 6 months - so I did not get as much done as I had hoped. It would be really nice to have a "buddy" system - so when you get sidetracked, and have limited resources, having someone to touch base with, call or connect with to encourage getting started, no matter how small, on the overall plan - that would be a real boost to staying on track. Especially for us single types. The program is great. Thanks. 2. Really enjoyed the class, it was very informative. 3. We found the site visits very useful. All around, this course is well worth the time to attend. Hope funding for it continues! 4. I loved this class, it provided me with so much information and a connection with the community. I would love to work to expand and share this class with all sorts of different demographics throughout our city and beyond! 5. After cardboarding over part of lawn to create beds, I added compost and cedar wood chips. I would not recommend that in a lawn bed situation as the wood chips blew all over the lawn and made a difficult to mow mess. 	

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.

Gardening is America’s NUMBER 1 past time. Bird watching is NUMBER 2. Combining both past times in one’s backyard is a strong reason to garden sustainably using organic and low impact maintenance practices.

Komo Kulshan Native Plant Society led the class’s native plant walk at the Stimpson Family Reserve. North Cascades Audubon Society provided an introduction to birding class. Both of these community groups offer continuing education in areas that support the implementation of sustainable landscaping.

- Most participants have stated a desire for a landscape that takes less time to maintain. Native plants require less on-going maintenance and inputs of fertilizer and pesticides which pollute our area water bodies. They are adapted to our climate so require little to no supplemental watering once they are established so conserve water.
- Many class alumni 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.

- Birding reinforces the benefits the gardener gets from a natural approach to landscape maintenance. Birds and beneficial insects prey on plant pests. Their increased presence in the landscape reinforces feelings of the value of environmental stewardship and sustainability.

INFORMING FUTURE OUTREACH AND/OR PROGRAM CHANGES

Class participants were asked several questions (developed by Anitra Accetturo) to inform government staff about preferences related to outreach education.

Table 6: Preferences for receiving code/policy information.

Please indicate your preferences for communicating code/policy information to residents regarding landscaping and rainwater collection.	YES	NO
Flowchart	7	2
Video available on web and BTV10	7	2
Hand-out examples of other residents' projects and permitting requirements (if any)	10	1
Scheduled deadline for code compliance	5	3
Workshops	10	0
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)	10	1
Other: 1. Permit flowchart really helpful. 2. Scheduled deadline for code compliance creates unhealthy pressure. 3. Asking questions in person is really helpful. 4. It has to go in stages for most people or start with hands-on or data, and proceed from these, depending on person's water bill and social, environmental concerns. Logic or emotion is the place most people start 5. \$ considerations/benefits. 6. Field Trips! 7. Include resources and phone numbers! 8. A blog or website that is easy to navigate and access. Currently it's very difficult and time consuming trying to find information online. In lay terms and not 'wordy'.		

Table 7: FEE

Should a FEE be charged for this Class?	YES	NO
Should a fee be charged for this class?	3	8
Do you think a fee for the class would prevent others you know from attending.	10	1

If a fee is charged, how much would be appropriate? Responses below: 1. Knowledge is priceless 2. The emotional commitment – the promise to talk to neighbors – is the highest fee = your word to

- stay/be involved.
3. Not paying \$ is an equalizer – making a commitment is a bond, a promise, also an equalizer and incentive.
 4. \$95
 5. #35-50
 6. \$35
 7. Having the class as free eliminates the possibility of someone not taking it for financial reasons. Although the amount of information presented, presentations garden tours, and help with our own yards is definitely worth monetary compensation. Perhaps asking for an optional donation on completion of the class.
 8. \$30

Table 8:

Rate Your opinion on the SCHEDULE for this class.	YES	NO
Should the schedule continue to be during the weekdays for this class?	10	1
If the class were offered two evenings a week with a tour on Saturday mornings, would you attend?	7	4
Do you think the current schedule prevented others you know from attending?	8	3

*It is so hard to say if the current schedule prevented others from attending – timing is everything. Being able to work and attend this class opens it up to a wider audience.

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
<p>Conduct 1 Class</p> <ul style="list-style-type: none"> • Follow up • BMP Pledge • Payback projects • Continuing education activity • Organize landscape tours • On-site consultation • Hands-on activities & demonstrations • Develop curriculum materials <p>Community Workshops:</p> <ul style="list-style-type: none"> • Audubon Society • Master Gardener Training <p>Conduct 2 short workshops for Whatcom Water Weeks</p> <p>Provide support for the HIP program</p> <p>Video of landscape make-over for WEB</p> <p>Provide information on mulches, choosing plants/natives, and Integrated Pest Management for the WEB site</p> <p>Follow-up assistance for community payback activities & landscape changes</p> <p>Develop educational displays on IPM and Healthy Soils</p> <p>Diorama-public display in at least 3 locations</p> <p>Evaluate program outcomes</p> <p>Prepare Technical Memorandum</p>	<p>1 -Participants will increase their knowledge about water quality & the link to gardening activities</p> <p>2 - Participants will understand the components of a sustainable landscape & it's benefits to them and environmental protection</p> <p>3 - Participants will understand strategies to manage storm water on their property</p> <p>4-Participants will increase knowledge about water conservation and rainwater harvesting</p> <p>5 –Participants will believe that their individual actions can have a positive impact on local environmental issues</p> <p>6 - Participants will feel confident about their understanding watershed issues and the role of gardening to protect water quality</p> <p>7 - Increase awareness, knowledge and interest in sustainable landscaping in the general public</p> <p>8 – HIP participants will develop a planting plan using native plants</p> <p>9 – General public will easily access information about mulches, choosing plants/natives and IPM on the website and through educational displays at community events.</p> <p>10 – Complete program evaluations</p>	<p>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</p> <p>2-Participants, as early adopters, demonstrate that this approach to landscaping can be attractive, functional & meet environmental goals to neighbors</p> <p>3 -Participant interaction will encourage and foster commitment to complete their landscape changes and sustain new behaviors</p> <p>4 - Participants will conduct community outreach with a goal of 150 contacts</p> <p>5 – Lake Whatcom watershed residents will complete HIP landscape changes</p> <p>6 – General public will utilize information presented about mulches, choosing plants/natives, and IPM in home landscapes</p> <p>7 - The information gathered in this project will increase the effectiveness of outreach educational efforts</p> <p>8 – BMP pledges will identify existing practices, intended new practices, and actual on-the-ground changes</p>	<p>Participants' actions will promote watershed stewardship activities in neighbors</p> <p>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</p> <p>Lake Whatcom water quality will improve as phosphorus loading decreases</p> <p>Policy makers will support continued outreach education to enhance stewardship of the watershed</p>

APPENDIX II: Program Evaluations

**WSU Whatcom Extension – Whatcom County
GARDENING GREEN: Sustainable Landscaping September 2015**

Please complete the program evaluation below to help us gauge 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?

1 Cascadia Weekly 1 Friend 3 Master Gardeners 4 WSU Extension *3 Other

* *Michael, during the "Image This" home and garden tour last July.*

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
			1	1	9
Class manual and CD	Distracted from understanding				
		1			10
The presenters communicated concepts and ideas	Poorly				Very well
			1	2	8
The pace of the class was	Too slow		Just Right		Too fast
		1	7	3	
The lectures, tours, and activities were well coordinated and enhance understanding	Strongly disagree				Strongly agree
				1	9
I would recommend this class to others	Strongly disagree				Strongly agree
					11

2) Rate your level of KNOWLEDGE change

Use a percentage rating between 0% (no knowledge of topic) and 100% (complete knowledge) Prior to Class / After Class										
The link between gardening practices and human / environmental health issues.										
70/90	80/90	20/40	25/70	30/80	80/90	50/85	100/150	80/95	90/100	90/95
The benefits the gardener gains by adopting a naturally sustainable approach to gardening.										
70/100	20/90	20/80	25/75	30/80	70/90	40/90	100/150	85/100	75/100	75/100
The benefits to the environment from a sustainable approach to gardening.										
90/100	50/90	10/80	25/75	10/90	100/100	40/90	100/150	85/100	80/100	90/95

The environmentally informed landscape strategies for stormwater management, climate change, etc											
50/80	0/80	40/90	15/70	0/75	50/90	20/85	50/100	80/95	60/95	50/75	
The function of healthy soil to water quality and plant health.											
30/50	30/90	30/50	50/85	50/90	100/100	30/80	50/90	75/95	75/100	50/75	
Selection of plants: match plant needs to site characteristics, purchase healthy plants, use good planting technique.											
10/70	15/90	50/75	45/80	10/75	90/100	25/85	0/50	75/95	75/100	25/90	
Use of regionally native plants in the home landscape.											
0/80	15/90	10/80	45/75	60/90	50/90	25/85	10/100	85/100	80/100	25/90	
Use of low impact maintenance strategies: grouping plants by need, mulching, smart watering, etc.											
10/80	40/90	30/80	65/85	20/70	90/100	35/85	35/85	10/80	95/100	75/100	10/90
Strategies to reduce/eliminate lawns and landscaping options for lawn alternatives.											
0/100	10/100	0/60	70/85	10/80	70/90	40/90	50/100	90/100	50/95	25/95	
Integrated pest management step-by-step methods to management pests using the least toxic means.											
10/90	80/90	50/60	30/65	NA	80/90	30/85	60/95	75/90	50/100	50/75	
Creating wildlife habitat and supporting biodiversity in plants, animals and beneficial insects.											
10/80	60/90	50/50	55/75	10/80	100/100	30/85	80/100	90/95	60/95	75/90	
Water consumption, conservation, and quality: rainwater harvesting.											
40/80	40/90	50/50	50/65	10/60	100/100	60/90	30/90	95/95	75/100	75/90	
Water quality challenges.											
10/60	40/90	50/60	30/60	10/70	80/90	60/90	25/75	90/95	80/100	25/90	

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) Prior to Class / After Class										
The landscape tours stimulated ideas for how to renovate my landscape to be more sustainable.										
10/80	30/100	25/50	80/100	10/80	50/100	35/85	50/100	80/95	75/85	0/100
Drawing a basic site plan showing existing conditions.										
5/70	30/100	0/50	80/90	30/70	100/100	55/90	50/100	95/100	45/80	75/100
Performing a site analysis.										

5/60	20/90	0/60	80/90	20/60	80/90	30/85	5/100	50/90	85/90	50/75
Generating and evaluating conceptual plans of possible sustainable site design changes.										
5/80	15/90	10/80	20/60	NA	50/60	30/85	50/100	75/90	50/75	NA
Creating a scaled drawing and planting plan for individual landscape beds.										
5/70	40/90	40/70	80/90	0/60	100/100	30/85	5/100	80/95	50/85	25/75
Designing and installing a rainwater collection system.										
5/70	0/90	10/25	20/80	0/20	25/50	10/85	50/75	50/75	20/75	75/95
Rainwater Harvesting										
5/70	10/90	70/75	25/65	10/70	25/50	10/85	40/80	50/75	40/85	85/95
Home Composting										
5/70	90/90	50/50	70/75	70/80	100/100	30/80	40/80	85/95	80/85	90/90

4) Rate your level of COMMITMENT: 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.				2	9
I intend to apply the strategies presented in this class to the design and management of my landscape.					11
I am confident that I can discuss sustainable landscape concepts to friends and neighbors.			2	3	6
I am convinced that I can positively impact environmental issues by my landscape choices and maintenance practices.				2	9
I intend to install a rainwater system at my home.		1	3	2	5

5) COMMUNICATION ABOUT CODE AND POLICY

<i>Please circle your preferences for communicating code/policy information to residents regarding landscaping and rainwater collection.</i>	YES	NO
Flowchart	7	2
Video available on web and BTV10	7	2
Hand-out examples of other residents' projects and permitting requirements (if any)	10	1
Scheduled deadline for code compliance	5	3
Workshops	10	

Demonstration sites on a city block available for self-guided tour with interpretative signage (e.g. SeaStreets in Seattle, http://www2.cityofseattle.net/util/tours/seastreet/slide1.htm)	10	1
Other: 9. Permit flowchart really helpful. 10. Scheduled deadline for code compliance creates unhealthy pressure. 11. Asking questions in person is really helpful. 12. It has to go in stages for most people or start with hands-on or data, and proceed from these, depending on person's water bill and social, environmental concerns. Logic or emotion is the place most people start 13. \$ considerations/benefits. 14. Field Trips! 15. Include resources and phone numbers! 16. In lay terms and not 'wordy'. 17. A blog or website that is easy to navigate and access. Currently it's very difficult and time consuming trying to find information online.		

6) CLASS FEE Mark the most appropriate response

Rate your opinion on the FEE for this class:	YES	NO
Should a fee be charged for this class?	3	8
Do you think a fee for the class would prevent others you know from attending.	10	1

If a fee is charged, how much would be appropriate? Responses below:

- 9. Knowledge is priceless
- 10. The emotional commitment – the promise to talk to neighbors – is the highest fee = your word to stay/be involved.
- 11. Not paying \$ is an equalizer – making a commitment is a bond, a promise, also an equalizer and incentive.
- 12. \$95
- 13. #35-50
- 14. \$35
- 15. Having the class as free eliminates the possibility of someone not taking it for financial reasons. Although the amount of information presented, presentations garden tours, and help with our own yards is definitely worth monetary compensation. Perhaps asking for an optional donation on completion of the class.
- 16. \$30

7) CLASS SCHEDULE

Rate Your opinion on the SCHEDULE for this class.	YES	NO
Should the schedule continue to be during the weekdays for this class?	10	1
If the class were offered two evenings a week with a tour on Saturday mornings, would you attend?	7	4
Do you think the current schedule prevented others you know from attending?	*8	3

*It is so hard to say if the current schedule prevented others from attending – timing is everything. Being able to work and attend this class opens it up to a wider audience.

8) Your comments are always appreciated. Please make suggestions for improving the class.

- 1. Add more real photos, not just from the internet

2. I just never wanted it (the class) to end!
3. This is such a learning curve, that it is taking me a while to fully absorb the information. I am still in process... and will be for a while. The handouts are great but I am hands-on, the tours help but so will 4 seasons. A good beginning – seeing which plants on which to focus. The tours were invaluable as was the soil/jar test. I have so pretty hard core neighbors – but this class has renewed my energy level and given me some new tactics to try. The religious skit was a real turnoff. Not all of us are Christians and this is a government sponsored class so a real surprise. The tours were invaluable – different people, different sites, different issues and stations in life, made the work ahead seem possible. The instructors' open accepting approach to life circumstances was also great – the realistic and trusting attitude that it may take time to develop and accomplish our goals but it will happen – confidence that in our own individual ways, we all will succeed. It would be nice to have a monthly (biannually, quarterly) opportunity to get together with our class and others in this process for updates/feedback/support would be nice – a way to stay connected and motivated. A booster shot if needed!! If structure is needed, maybe a short presentation on seasonal/native plants or a specific topic, followed by an opportunity to share progress/ask questions/get a booster shot... Validation of the time it takes and the progress made. Thank you!! Great job...
4. More tours
5. Really appreciated presenters sharing their experience and wisdom. Field trips were inspiring and educational. Liked the combination of classroom learning and field trips. Great course! Thank you!
6. I think you can see the interest in a free class with 100% attendance. Having it in the evening would allow others who are working to attend. We are now all stewards of the earth. By attending this class I feel I can spread my knowledge with more confidence – not by hearsay or passing on poor practices. I would recommend that at the start of each class the speaker refer to the chapter in the book you will be covering. And include the slides in the binders. For the adult learner best to have a small activity or exercise every 15 minutes. Three hours of lectures with one break is a lot of information and hard to integrate it. I realize if this were done the class would need to be longer. All the info given was totally appropriate. I LOVE LOVE LOVED the diversity of topics in the class. Including Stimpson and the Bird ID was awesome My biggest and greatest learning has been regarding how to transplant with greater success and the differences between all the mulches. I've been a gardener for years but I'm still having to relearn old tricks. Finally, the home tours were so important because it not only showed a variety but the enthusiasm of the gardeners of sustainable landscaping.

Appendix III

BEST MANAGEMENT PRACTICES PLEDGE

"I am committed to using the knowledge and skills I have learned during this class to create a sustainable landscape.
I intend to implement the Best Management Practices checked below." _____

Prior to Class	After Class	
STORM WATER MANAGEMENT		
5	8	Maintain 3 or more layers of canopy cover in landscape beds.
5	6	Plant more trees including conifers.
6	4	Locate landscape beds or French drains to intercept runoff at the base of slopes.
2	4	Locate landscape beds to capture runoff from lawn areas.
4	5	Locate landscape beds (can be on mounded soil) around the property perimeter to create a final barrier to run-off.
3	6	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.
3	6	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.
4	7	Put curves in paths that go downhill to slow rainwater runoff so it can be absorbed into the soil.
2	10	Expand the size of densely vegetated landscape beds to reduce lawn area.
1	4	Create native plant buffers near all water resources.
5	5	Create a woodland area.
1	4	Infiltrate run-off from vegetable gardens, fruit trees, covered compost piles & dog kennels to capture nutrients in run-off.
2	1	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.
5	4	Install a rain barrel or cistern for storm water reuse in landscape.
54	86	SUBTOTALS

PROTECT HEALTHY SOIL FUNCTION

10	7	Compost yard wastes for reuse on landscape beds.
8	9	Mimic nature by leaving plant litter where it falls for self-sustaining soil health in permanent landscape beds.
2	11	Top-dress soil with compost covered by woody mulch to improve soil function.
1	2	Till in 2-3" compost (depth of 8") in areas of <i>severely damaged</i> soil from compaction
1	7	Inoculate native plant beds with mycorrhizae.
3	9	Maintain a woody mulch cover on all landscape beds to protect soil.
3	9	Create pervious paths that are separate from planting areas even through lawn areas to prevent soil compaction.
4	9	Feed the soil, not the plants. Reduce/eliminate fertilizer use.
32	63	SUBTOTALS

RIGHT PLANT / RIGHT PLACE / RIGHT PLANTING TECHNIQUES

6	11	Group plants by sun exposure and watering needs to reduce plant stress & maintenance.
4	13	Use native plants as the backbone of the landscape.

5	11	Inspect plants for diseases, pests, & root problems before purchase.
2	12	Use the right planting techniques.
6	9	Select plants adapted to your climatic zone for hardiness.
5	10	Plan for mature size of plants to reduce pruning.
28	66	SUBTOTALS

LOW IMPACT LAWN CARE

2	6	Establish pathways through lawn areas to reduce soil compaction.
8	6	Allow lawns to go dormant in the dry season.
0	3	Use eco-lawn as turf alternative.
2	5	Use only phosphorus-free fertilizer.
7	5	Hand weed lawn or tolerate a few weeds (no weed & feed).
0	2	Aerate compacted lawns & add a little compost.
7	4	Limit lawn watering to 1" per week including rainwater or less
26	31	SUBTOTALS

WATER CONSERVATION

1	4	Separate lawn irrigation system from irrigation for trees and shrubs, which need much less frequent watering.
8	9	Use smart watering techniques – water in the mornings, water deeply and infrequently to encourage root growth.
2	9	Use drip irrigation to water only landscape plants not weeds.
4	6	Use soaker hoses instead of overhead sprinklers.
3	13	Plant drought tolerant plants.
2	3	Inspect automatic irrigation systems for leaks and adjust sprinkler head direction each monthly. Use a moisture sensor rather than a timer to operate the system.
2	10	Reduce need for irrigation by using 3" of mulch and planting 3 or more layers of canopy cover in all landscape beds.
22	55	SUBTOTALS

LOW IMPACT MAINTENANCE & INTEGRATED PEST MANAGEMENT

8	5	Eliminate the use of cosmetic pesticides such as herbicides used for appearance not plant needs.
8	7	Reduce the use of all pesticides. Select pest and disease resistant native or plants that are well adapted to region.
4	10	Do not fertilize woody plants unless they have been diagnosed as deficient. Use phosphorus-free fertilizer.
4	9	Regularly monitor landscape for pests. Hand pick while infestations are small.
0	10	Have pests & diseases correctly identified by Master Gardeners at WSU Extension.
6	8	Only use slug bait that is safe for pets & wildlife.
7	11	Practice tolerance for minor infestations that cover less than 30% of the plant.
5	8	Manage not control of pests and diseases. Practice I.P.M.
5	9	Remove diseased plants (Clean Green) rather than using pesticides.
1	10	Pay attention to "signal words" on pesticides. Use and dispose of according to manufacturer's directions.
10	11	Hand weed and mulch to reduce weed seed germination.
58	98	SUBTOTALS

SUPPORT BIODIVERSITY

5	11	Create a wildlife habitat sanctuary to address the decline in bird, amphibian, and beneficial insect species.
4	13	Grow a species rich landscape of regional native plants to address the loss of local flora.
7	11	Do not grow noxious weeds or aggressive exotic plants that can escape and crowd out native species.
16	35	SUBTOTALS

REDUCE ENERGY CONSUMPTION

7	7	Use hand tools or electric power tools whenever possible and reduce use of gas powered equipment.
4	6	Use motion detectors to activate outdoor lights rather than timers.
1	7	Plant buffers to block northeast winds in the winter to lower heating needs.
2	10	Plant deciduous shade trees on the south & west sides to cool the house & impervious surfaces.
14	30	SUBTOTALS

250 464 Total BMP's

APPENDIX IV: Class List SEPTEMBER 2015

Carol Wilcox	ncbanjoista@gmail.com	4817 Whitney St., Bham	919-469-2596
Deborah DeGolyer Michael DeGolyer	degolyer@icloud.com	9298 Stein Rd, Custer	360-543-9094
Leah Wang Sherman Wang	wang136@sbcglobal.net	3315 Sweet Road, Blaine	323-422-5951
Priscilla Gillette	priscillagillette@gmail.com	1829 E Viewmont Dr	360-202-6480
Pat Watkins	pnw123@comcast.net	6150 Snowden Ave., Ferndale 98248	360-312-8208
Susan Messer	humeniks@comcast.net	3124 Tanglewood Ln	393-0004
Ava Carey Jason Darling	avacareyphotography@gmail.com	4256 Ridgewood Ave, Bellingham WA	360-220-3060
Carol Bultsma	carolbultsma@hotmail.com	2514 Elmont Court	360-920-9418
Noelle Holland	nchollanddesigns@yahoo.com	34 Little Strawberry Lane, Sudden Valley	360-319-3401
Teresa Morris	treeana2003@yahoo.com	114 Poplar Drive	360-966-2984
Christopher Summers	christophersummers-10@sandiego.edu	2929 Madrona Street, Bham	949-291-3828
Chris Craven	cfcraven@gmail.com	605 12th Street Bham	360-306-1473
Jim Kent	Earlene.Kent@wwu.edu	3310 18th Street, Bellingham	360-305-6938

APPENDIX V: Class Schedule GARDENING GREEN Sept/Oct 2015

BRING TO CLASS		WEEKLY HOMEWORK
Tuesday-Sept 22 Food & Drinks Camera Walking Shoes	Class orientation Gardening Green-Sue Taylor Link Gardening/Environ Sue Blake TOURS Stimpson Family Reserve - Guided Native Plant Walk Geneva Neighborhood Walk - Forest/Landscape Comparison	Design Development Activities: 1. Basic Site Plan - Map Your Yard 2. Evaluate You Yard 3. Take a Photo Inventory 4. Do a soil analysis
Thursday-Sept 24 Food & Drinks Camera Soil Sample-quart bag Quart Jar Gloves	Healthy Soil - Sue T HOME WORK: Design Development Activities - Sue Rainwater Harvesting - Anitra Accenturo TOURS Jenny & Bill - no lawn, cisterns, food, rain garden, natives Michael - reduced lawn, added natives, stormwater, cisterns	5. List the uses for your family's outdoor living space and estimate the size of each space.
Tuesday-Sept 29 Food & Drinks Camera	Environmentally Informed Design-Sue T Right Plant/Right Place/Right Technique - Jill Cotton TOURS Bonnie - 2 acres, woods, terracing, food, swale Michael & Mary - small lawn, pervious patio, cistern, solar	Continue with Design Development: 1. Finish the analysis of site conditions 2. List 3 goals for landscape FUNCTION 3. Review BMP's form.
Thursday-Oct 1 Food & Drinks Camera	Low Impact Maintenance Techniques - Jill Lawn Alternatives - Sue T TOURS Ron - Replacd front lawn, drip irrigation Sue K- garden rooms, layered plantings, natural lawn care	Planning Activities: 1. Imagine your dream garden 2. Develop a few Schematic Plans 3. Select BMP's for your landscape 4. Finalize plan & create a master plan
Tuesday-Oct 6 Food & Drinks Camera Bring a copy of your BMP list	Integrated Pest Management - Jill Landscaping with Native Plants - Sue T TOURS Barbie - no lawn, food, cisterns, small lot, pervious walks George - cisterns, hydroponics food production	4. Finalize plan & create a master plan to document ideas and changes 5. Measure and draw up first project area 6. Research plants 7. Design plant placement for first project
Thursday-Oct 8 Your Master Plan Binoculars Bird Field Book Class Evaluation & Pay Back Plan	TOURS Bird Identification Walk - Paul Woodcock Sue T - stormwater management, habitat, natives, woodland Share plans for sustainable landscape changes & pay-back	Continue Planting Plan, Construction, & Low-impact Maintenance Practices Call or email to schedule your on-site consultation Enjoy your outdoor oasis!

