

Lesson 9

Student Stewards³¹



The lesson opens with a writing exercise in which students respond to prompts about the role salmon play in our society, economy, and environment. During a class discussion, students describe what the word stewardship means to them and list some reasons why stewardship is important. In small groups, students analyze case studies about youth environmental heroes and how their work ultimately affects salmon.

Objectives

Students will:

- Write about the role salmon play in our society, economy, and environment.
- Define the word stewardship and its importance to salmon and watershed health.
- Analyze case studies about youth who are working to protect watersheds and endangered species.
- Present information about their assigned case study.
- Summarize information presented about other case studies.

Students will understand:

- People of all ages are responsible for creating a sustainable future.
- Youth can be powerful change agents.
- By being stewards of salmon, we are also protecting watersheds and everything that lives in them.

Time Required

Approximately 1 hour.

Preparation

□ Handout: *Case Study*

Print 4-5 copies of each case study.

□ Handout: *Student Stewards*

Print 1 copy per student.

Keywords

Environmental stewardship—Responsible use and protection of the natural environment through conservation and sustainable practices.

Conservation—The protection of animals, plants, and natural resources.

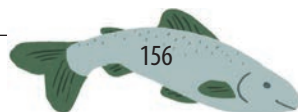


Background Information

Environmental stewardship empowers people of all ages to assume responsibility for creating a sustainable future. Teaching environmental stewardship involves fostering the development of several core values and beliefs. For students to become environmental stewards, they must understand that all people are part of the environment and that their actions can have affects both locally and globally. Stewards also understand that people have a responsibility to respect and care for Earth and all of its inhabitants.

Schools play an important role in preparing and empowering students to become stewards. Before students can take on this role, they must understand that youth can make a difference. In order to help students understand how they can make a difference, this lesson features case studies of students who are making change in their communities and beyond. The extensions following this lesson provide resources for students to learn more about stewardship and to become engaged on a deeper level.

Around the world, youth are working together to build stronger communities, create healthier environments, and raise awareness of endangered species. The case studies presented in this lesson highlight kids who are actively promoting water conservation, climate change solutions, salmon habitat restoration, and marine debris prevention. Each of these projects can ultimately contribute to watershed restoration and the recovery of salmon and inspire your students to take action in their own communities.





Lesson

Introduction

1. Write the following prompts on the board and give students a few minutes to complete each sentence on a piece of paper:
 - One of the most interesting things that I have learned about salmon is...
 - Salmon are a keystone species...
 - Salmon are important to culture...
 - Without salmon fishers...
 - Salmon are connected to people...
2. In think-pair-share format, have students share their answers.
3. Write the word **stewardship** on the board and ask students what the word means to them.
4. Explain that environmental stewardship refers to responsible use and protection of the environment.
5. In popcorn format or through a free write, have the students list reasons why people should be stewards of watersheds and salmon.
6. Ask students to share examples of how they, their family, their friends, or other community members have acted as environmental stewards.
7. Share the following excerpt with the class:

Since salmon live in streams, rivers, estuaries, and the open ocean, the health of salmon populations are a good indicator of how well we are taking care of our ecosystems.

By being stewards of salmon, we are also protecting watersheds and everything that lives in them—including people.

Activity

1. Share with the class that today they will be learning about young people around the world who are environmental stewards.
2. Divide the class into 6 evenly-sized groups.
3. Assign each group a different case study.
4. Give each student a copy of the assigned case study.
5. Instruct students how you would like them to read the case study (e.g., silently, together as a group, round robin, etc.).
6. Once groups are finished reading, give each student a copy of the handout **Student Stewards**. Have students complete Part I.

Option: Ask each group member to take on a different role such as reader, recorder, presenter, timekeeper, etc.

7. Tell the class that each group will have two minutes to present their case study. While groups are presenting, the audience will complete Part II of the handout **Student Stewards**.
8. Give each group about two minutes to present their answers from Part I.
9. Bring the class back together and lead a class discussion using the following prompts:
 - Do any of these project inspire you to take action?
 - How could our class or school create programs like these?
 - How would you like to get involved in environmental stewardship?



Discussion Questions

1. What are some reasons people might want to become environmental stewards?
2. Do people have a responsibility to be environmental stewards?
3. What are important skills or characteristics of people who work to be environmental stewards?
4. How could getting involved in environmental stewardship projects improve your quality of life?
5. Do you need to complete big projects—like the ones in the case studies—to be a steward?

Action Project

Start a Stream Team or Salmon Savers program at your school. Stream Teams often monitor water quality, remove invasive species, pick up litter, and plant native species. In addition to these types of activities, Salmon Savers also educate the public about the health of local salmon runs and what people can do to help. The **National Wildlife Federation**, **Department of Conservation of New Zealand**, and **New South Wales Environment Protection Authority** provide step-by-step guides for designing and implementing school-wide programs. For additional support, contact wcr.education@noaa.gov.



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ADDITIONAL RESOURCES

Books

Mary Coley: *Environmentalism: How You Can Make a Difference* (32 pages, 690L)

This book describes what environmentalism is and what students can do to make a difference.

Megan Kopp: *Living in a Sustainable Way: Green Communities* (32 pages, 1020L)

Students will discover how people around the world are choosing to live more sustainably.

Rae Simmons: *Sustainable Lifestyles in a Changing Economy* (64 pages, 110L)

This book covers the effects of living unsustainably and small steps that kids can take, such as using less energy and shopping at second hand stores, to make a difference.

Guides

Shelburne Farms: *The Guide to Education for Sustainability*

Learn strategies for integrating sustainability into your school and curriculum.

Ontario EcoSchools: *Environmental Stewardship Guide*

This guide provides schools with tools for developing environmental stewardship campaigns for the whole school.

EPA: *Volunteer for Change*

Find examples of volunteer projects from around the country.

Video

Sylvia Earle: *My wish: Protect our oceans* (18:04)

Sylvia Earle shares astonishing images and stats about the ocean and encourages everyone to protect our planet.



The Grey Water Project - Fremont, California

"I started this project to be a part of the solution to the California drought."

- Shreya Ramachandran, Founder of The Grey Water Project

Around the world, drought affects millions of people. Because of droughts, some people might not have enough water to drink or to shower. Farmers may not have enough water for their crops or farm animals. Climate change is likely to make droughts become more regular and severe.

Soon after witnessing the effects of drought in California, Shreya travelled to India. In India, she noticed that the droughts were so severe that people had to abandon their farms or villages. She also noticed that many Indians had adapted to living through droughts.

"I learned about the many ways locals save water, including rainwater collection systems which are mandatory in every household," explained Shreya. "However, I was particularly interested in reuse of greywater (which is lightly-used water), especially from the laundry."

In India and other countries with frequent droughts, people often reuse water. Water from showers, bathtubs, kitchen sinks, and laundry is fairly clean. It can be saved to water gardens or flush toilets. This helps save water and money.

After returning to the US, Shreya's interest in reusing grey water continued to grow. Shreya was particularly interested in using grey water from laundry. After some research, she

Drought not only affects people, but it also affects aquatic plants and animals. If there is not enough water in rivers and streams, salmon cannot migrate to or from the ocean. Salmon also need enough water to lay their eggs. If there is not enough water in streams or rivers, the water can become too warm for salmon to survive.

Shreya Ramachandran, a middle schooler in California, has seen these effects of drought first hand.

"I talked to people whose wells have run dry, leaving them waterless, and farmers who have lost their years' crops," said Shreya. "I was touched, and I wanted to find a way to help conserve water."



COURTESY OF THE GREY WATER PROJECT



COURTESY OF THE GREY WATER PROJECT

The Grey Water Project, Page 2



found that some laundry detergents can be toxic to plants and aquatic life. If people are watering their gardens with grey water, they have to make sure it is safe for the environment.

After talking with her grandmother, Shreya found out about soap nuts. Soap nuts are a natural laundry detergent that comes from a berry. Shreya wanted to find out if this type of laundry detergent would harm plants and aquatic life too.

After a series of tests, Shreya found that soap nuts do not harm plants or wildlife. She was surprised to learn that grey water with soap nuts even helped the plants grow! This was a great finding since soap nuts cost less than most natural laundry detergents.

She presented her findings at local water districts. She also won several awards at regional, state, and national science fairs. Shreya's work has inspired so many people that she won the **President's Environmental Youth Award**. Way to go, Shreya!

After this discovery, Shreya formed The Grey Water Project. This program encourages Californians to conserve and reuse water. Through social media, Shreya shares information about conserving water and using grey water. She also gives presentations at local schools, water boards, libraries, and community events.

The Grey Water Project also hosts a water conservation challenge for kids. The challenge encourages kids to take shorter showers, turn off faucets when brushing their teeth, use grey water to water plants, and more.

To learn more about Shreya's project, visit:
www.thegreywaterproject.org.



Take Action!

Want to get your school or family involved in water conservation? Visit Water Use it Wisely for water saving tips, games, and contests.

www.wateruseitwisely.com/kids



Pigtails Art - Sioux Falls, South Dakota

“Endangered animals are important to the planet and to people. My hope is that my project will inspire people all over the world and show children they have the power to change the world and save animals too.”

- Bria Neff, Founder of Pigtails Art

Bria Neff has always had a passion for art. She first started drawing animals at age four. By second grade, she was entering and winning art competitions.



COURTESY OF AMITY NEFF

The Animal Action Education's 2015 Art and Essay Contest changed Bria's life. Her painting of an African lion was one winner of the contest. Bria was so inspired by winning this contest that she wanted to do more to protect endangered species. After the contest, she began asking her mom questions about why animals were endangered and what that meant.

“She wanted to know what endangered meant, how many animals were endangered and above all else—why? Why were they dying, why were they hunted, and what could she do to save them?” remembers Amity Neff, Bria's mom.

Bria's original goal was to raise \$10,000 by her 11th birthday. The first painting she sold was a depiction of two lions, titled “Brotherly Love.” This painting sold for \$125. In her first year alone, she raised more than \$5,000!

Bria's artistic process is thorough. Before painting an animal, Bria first finds pictures of the species and studies them. She even researches each animal at the library or by watching documentaries. To compliment her art, she writes a report about each species!

Bria likes to paint animals with detailed eyes and vivid expressions.

As Bria explained, “I wanted to give them a face so people would know how important they are.”

Through her research, Bria has learned a lot about endangered species. She has learned that it is important to protect both animals and their habitats. She has also found that every species has an important role to play in its ecosystem. Habitat loss, deforestation, and climate change



COURTESY OF AMITY NEFF

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COURTESY OF AMITY NEEF



are some of the major problems leading to extinction. By the time she was ten years old, Bria had painted over 200 species and donated \$10,560! She gives the money to her favorite charities, including International Fund for Animal Welfare, The Wolf Conservation Center, and The Jane Goodall Institute.

To further raise awareness about endangered species, Bria has hosted art shows, published coloring books, and created social media campaigns.

In celebration of Earth Day 2016, Bria started a campaign called Chalk the Walk Earth Day. On social media, she asked people to make sidewalk art representing love for Earth. She then asked people to take pictures of their sidewalk art and post the pictures on social media. Bria plans to continue this campaign every Earth Day.

One of her coloring books is titled "Endangered Faces of The Great Plains Zoo." The book features coloring pages of the zoo's 24 endangered species, and messages about protecting animals.

The coloring book is sold at the local zoo. The profits are donated to the zoo's conservation programs. Bria hopes that her coloring books inspire other kids to make a difference.

"I hope they can learn that they can help and save the animals, and they can change the world," she said.

Since Bria has inspired so many people with her art and generosity, she was awarded the **2017 International Youth Eco-Hero Award**. Way to go, Bria!

To learn more about Bria's work, visit:
www.pigtailsart.com.



COURTESY OF AMITY NEEF

Take Action!

Want to raise money for your favorite endangered species? Panda Nation provides fundraising tools for endangered species, such as salmon.

https://support.worldwildlife.org/site/SPageServer/?pagename=panda_nation_fundraising

PANDA NATION
Be the hero nature needs



The Solutionaries Project - Burlington, Vermont and Mzuzu, Malawi

“Ever feel like the world is all bad news? So did we. So we set out to find the people in our communities who are doing good things.”

- Miles Lamberson, The Solutionaries Project

Sometimes the news can make us feel overwhelmed. Hearing about big events like climate change can even make us feel powerless. When people hear bad news, they often shut down instead of taking action.

Together, they launched The Solutionaries Project. During their podcasts the students interview local people who are taking action. Most of the podcasts focus on climate change. Others focus on community issues like poverty, happiness, and agriculture.

What does climate change have to do with salmon? Climate change can increase the temperature of water. If water is too warm, salmon eggs will not hatch. Another effect of climate change is ocean acidification. Ocean acidification makes it harder for salmon to detect predators and prey. Climate change can also cause more severe droughts. Without enough water, salmon can not migrate.

In one climate change-focused podcast, students interviewed Duane Peterson. Duane is a cofounder of a solar panel installation company called SunCommon. This company works to make solar panels cheap and easy to install. By making solar panels cheaper, more people can buy them. Instead of burning fossil fuels, solar panels use energy from the sun to create electricity. This reduces carbon dioxide emissions, a major cause of climate change.

Students from Vermont Commons School were feeling overwhelmed after hearing about climate change disasters in their classes. Instead of ignoring climate change, the students made a plan.

“It’s about seeing what is wrong with the world, and taking the steps to make it better—no matter how small those steps are.” - Maggie Homer, The Solutionaries Project

The students set out to use the news to empower people, rather than paralyzing them with fear. Students from Vermont Commons School worked with students from Mzuzu Academy in Malawi, a small country in southeastern Africa, to create a podcast series. A podcast is like radio show on the internet.



COURTESY OF THE SOLUTIONARIES PROJECT

COURTESY OF THE SOLUTIONARIES PROJECT

The Solutionaries Project, Page 2



While The Solutionaries are working on their podcasts, they are gaining valuable skills. Students learn about different career opportunities. They work on their writing and editing skills. Maybe most importantly, they get to know members of their community.

To learn more about The Solutionaries Project, visit:
<http://solutionariespodcastproject.blogspot.com/>.



In another episode, students interviewed locals about deforestation in Malawi's Chikangawa Forest. So many trees have been cut from the forest that the region has more droughts and floods than normal. Students interviewed workers from Raiply, a factory near the forest. This factory is working to plant trees and protect the biodiversity of the forest. They also interviewed local villagers whose livelihood is being affected by deforestation.

"It is our duty to preserve the environment and its resources for future generations, rather than using them all up." - Spencer Reed, The Solutionaries Project

The Solutionaries also write essays about their vision for a positive future. In these essays, students think about how their own choices affect the environment. They give advice for staying optimistic when there is too much negativity on the news. Students discuss what a positive future looks like and how we can achieve this future.

"I want my children to live in a better world, but one that values the environment as an equal to technological advancement." - Peter Larsen, The Solutionaries Project

Take Action!

Want to share stories that are important to our planet or your community? Submit a story to Voices of Youth.

www.voicesofyouth.org



Students Saving Salmon Club - Edmonds, Washington

"I think everyone in the project is a hero for just being part of something that's making an effort to make the Edmonds streams better for the salmon. Everyone who's taking any sort of action is a hero."

- Ava Wilson, member of Students Saving Salmon Club

Willow Creek, Shellabarger Creek, and Shell Creek are small creeks in Western Washington State. These creeks empty into Puget Sound, which leads to the Pacific Ocean. The creeks are home to insects, amphibians, and fish.



COURTESY OF JOE SCORDINO

Members of the Students Saving Salmon Club (SSSC), want to learn more about the health of these creeks and how the water quality is impacting salmon. Students conduct hands-on research at these creeks to test the oxygen levels, water temperature, bacteria levels, pH, and nitrates. After they collect, analyze, and graph their data, students meet with the city council and other community groups. They tell community members about the condition of local creeks, and offer different solutions to improve habitat for salmon.

Salmon currently spawn in only one of the three creeks—Shell Creek. SSSC members volunteer with the Edmonds Stream Team to find out about water quality in all three creeks to determine if that might affect salmon. Club members compare the data from local creeks to data from healthy salmon creeks.

The other two creeks, Willow and Shellabarger, drain into the Edmonds Marsh, which currently drains to Puget Sound through a 1,600-foot pipe. This long stretch of pipe likely prevents salmon from returning. The City of Edmonds is undertaking a feasibility study to replace the pipe with a tidal channel to allow salmon to enter the Marsh and streams.

The group has been able to make a big affect because of their enthusiastic members and mentors.

As Taylor Blevins said, "Everyone is hardworking and has a determined attitude. Everyone who is volunteering wants to be there and truly make a difference for the salmon and to help out streams."

The group's enthusiasm and efforts are paying off. Students have broadened their efforts and have begun working with homeowners. Students go door-to-door and talk with homeowners about landscaping and how it affects salmon. Even though this process can be challenging, club members find it rewarding.



COURTESY OF JOE SCORDINO

Students Saving Salmon Club, Page 2



“It took longer than we expected to go from door-to-door and not everybody was willing to talk to us,” said Taylor Blevins. “Nevertheless, we were able to reach all the houses we wanted to and came back at a later date to talk to the people we had missed.”

After students survey the homeowners, they work with them to plant salmon-friendly plants along the creek. These plants help keep the water cool, prevent erosion, and provide cover for salmon to hide from predators. Jared Yu, club secretary, found that working with homeowners really stretched his skills.

“It was hard to have to talk to strangers at first but it helped build my confidence and communications skills,” Jared said. “It was encouraging that a lot of the residents were already taking measures to be safe, and we can help by spreading knowledge of what homeowners can do to prevent contamination and improve stream habitat.”

It's not only the salmon who are benefiting from SSSC. By working with scientists, students learn how to properly sample and record data. Through data analysis and graphing, students improve their math skills. When students present data to the city council, they learn about local politics. By

reaching out to homeowners, students learn important communication and outreach skills. The SSSC has become a great way for students to learn new skills, explore future career paths, and work alongside experts.

To learn more about the Students Saving Salmon Club, visit:
<https://twitter.com/ewhssavesalmon>.



Take Action!

Want to bring a salmon club to your school? Contact your local Adopt-a-Stream program, Adopt-a-River program, or Students for Salmon club.



TreePeople Youth Leadership Program - Los Angeles, California

“As the summer season swings into action and temperatures start to rise, it’s the perfect time to remember that as Angelenos, we all have the responsibility to act as stewards for our water and urban trees.”

- Edith de Guzman, member of TreePeople

Los Angeles has been experiencing more frequent droughts. These droughts have greatly affected the city’s trees. Drought can cause burned leaves, slow growth, and a loss of roots. Trees that have experienced long-term droughts are more vulnerable to pests and diseases.



COURTESY OF TREE PEOPLE

What does climate change have to do with salmon? Climate change can increase the temperature of water. If water is too warm, salmon eggs will not hatch. Another effect of climate change is ocean acidification. Ocean acidification makes it harder for salmon to detect predators and prey. Climate change can also cause more severe droughts. Without enough water, salmon can not migrate.

In order to get kids involved, TreePeople created the Youth Leadership Program. This program teaches young people how to care for trees in their communities. The program was started in 2014, and in three years volunteers have cared for more than 600 trees!

TreePeople’s programs are unique because volunteers continue to care for trees five years after they were planted. This helps ensure the trees survive long into the future.

Throughout the summer, students will make sure that the trees are taken care of properly. In addition to watering the

TreePeople, a nonprofit organization in Los Angeles recognizes that the city’s trees need help.

“After five years of historic drought and extreme heat, many of LA’s trees are thirsty and vulnerable,” said Caitlin Dunham from TreePeople. “And without healthy trees shading campuses and communities, students suffer.”

Why do trees matter so much? Trees provide many environmental benefits, including cleaning our air. Trees remove carbon dioxide from the air and store large amounts of carbon in their wood. Carbon dioxide is a major cause of climate change.



COURTESY OF TREE PEOPLE

TreePeople Youth Leadership Program , Page 2



trees, students mulch and re-stake trees when needed. They also learn how to remove suckers from trees. Suckers are plants that grow near the trunk of the tree or small branches that grow from major branches. They are called suckers because they “suck” nutrients from the trees. Students also look for ants. Lots of ants traveling on the trunk or on branches can indicate there is something wrong with the tree.

Trees are not only important for the environment, but they are also important for people. Living near trees can reduce neighborhood crime. Trees can increase the value of your home. They also keep temperatures cooler in summer, which reduces cooling costs. Research has shown that people who have access to trees and nature have higher academic achievement and less stress.

While some neighborhoods in Los Angeles have plenty of trees, others have almost none. TreePeople works to ensure that low-income neighborhoods have trees too.

“In urban areas, extreme heat is a social justice issue,” said Jessica Jewell of TreePeople. “Low-income communities and people of color are at highest risk, as they tend to live in neighborhoods with less trees, more heat-retaining surfaces, poorly-insulated housing and limited access to air conditioning.”

By working with people of all ages from neighborhoods around the city, TreePeople hopes to create a healthy urban

environment for all everyone.

To learn more, visit:
www.treepeople.org.



Take Action!

Want to plant trees in your schoolyard or community? Contact the Charitree Foundation to get free trees for your school!

www.charitree-foundation.org/request-trees-for-kids/free-trees-for-schools/



Youth Media for Trash Free Waters - New York, New York

There are 5,250,000,000,000 (trillion) pieces of plastic debris in the ocean.³² And this number is growing every day! What can kids do about such a huge problem? Members of Youth Media for Trash Free Waters are setting an example for students around the world. In this program, kids produce creative videos that tackle issues like waste and litter.

But what does litter have to do with salmon? When litter reaches the ocean, it is broken into smaller and smaller pieces. Salmon, and other animals, can mistake this trash for food. When animals eat too much trash, they can get sick or die. About 25% of fish sold at markets have trash in their guts.³³



Students in the Youth Media for Trash Free Waters program first learn about litter and how it affects animals in the ocean. They then work with professionals to learn how to tell interesting stories. Some of their stories include animations, dances, songs, or interviews with scientists. After students conduct interviews, collect data, create story ideas, and decide on a video style, they work with professionals to develop short videos.

In addition to making videos, students collect and analyze data. While students and local community members clean up beaches, they count the amount and types of trash they find. This information is shared with neighbors, community groups, and local governments. They also share this data with elected officials so that they can better understand litter issues.

The kids want to make sure that their neighbors understand that litter on their streets winds up in the ocean. To



demonstrate this, students compare the litter they find on their local streets with the litter they find on beaches. They then share this information with their neighbors.

To help spread the word about these litter and marine debris issues, the videos include a take action message and a social media campaign. Some students have even given talks at press conferences. Others have met with elected officials to share their knowledge.

Some students have even started campaigns to reduce waste. They work with local restaurants and grocery stores



Youth Media for Trash Free Waters, Page 2



To learn more, visit:
www.cafeteriaculture.org/trash-free-waters.html.



to reduce single-use plastics. Single-use plastics are things like straws, candy wrappers, and plastic bags that are thrown away after being used just one time. Single use plastics are a big source of litter and marine debris.

Other students have chosen to get involved with microbeads. Microbeads are tiny pieces of plastic that are in products like face wash or toothpaste. Microbeads get washed down the sink, and eventually into the ocean. Students in one video show people how to make their own skincare products without microbeads.

Not only are students helping minimize waste and stop litter, but they are gaining valuable skills. Throughout this program, students learn creative storytelling through visual and performing arts. They also learn how to produce professional-looking videos. Through data collection and outreach to the public, students learn about citizen science and civic engagement.

This program was funded by a grant from the US Environmental Protection Agency (EPA) Region 2. Local partners—such as NYC Department of Environmental Protection, Brooklyn College, local community centers, and libraries—were key to the success of this program! If you have an idea for a program in your community, you can work with your teachers or parents to apply for a grant from NOAA's Marine Debris Program or your Regional EPA.

Take Action!

Want to help scientists track marine debris? You can report litter and marine debris using the Litterati or Marine Debris Tracker apps.

www.litterati.org
www.marinedebris.engr.uga.edu



Student Stewards

Part I. Case Study Analysis

Directions: Read the questions below and discuss the answers with your group. Answer the questions using complete sentences. Your group will present their answers during a classroom presentation.

1. Summarize this project in 1-2 sentences.

2. What is the goal of this project?

3. How is this project an example of environmental stewardship?

4. List at least two ways this project could help salmon.

5. Do you think you could start a project like this? Why or why not?



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Part II. Group Presentations

Directions: Complete the table below while other groups present their case studies.

Case Study	What is the goal of this program/ project?	How could this program/project help salmon?	How could you get involved?
The Grey Water Project			
Pigtails Art			
The Solutionaries Project			
Students Saving Salmon Club			
Youth Leadership Program			
Youth Media for Trash Free Waters			

