Glossary words are in **bold** and are defined on page 22.

Flower Power:
Planting for the Past and the Future

Meet the Scientists!

Photo by Alex Kudryavtsev.

▼ Dr. Keith Tidball,
Senior Extension Associate

My favorite science experience was studying how ants affect sand dune erosion in the Kalahari Desert in Southern Africa.

▲ Dr. Marianne Krasny,
Forest Ecologist

My favorite science experience was working on the Tanana River floodplain in Alaska to collect data on seedlings and floods, while watching out for moose and bears. In this photo, I am in Shanghai, China. I was in China for the Shanghai World Expo. This Expo highlighted city life around the world. Notice the interesting tree near me. These trees are made to grow this way for decoration.

▶ Dr. Erika Svendsen, Research Social Scientist

My favorite science experience is speaking with people in cities who are caring for the environment. I like asking them a very simple question, "Why are you doing this work?" Over the years, I've found the answer to this question to be an **affirmation** of life, community, democracy, and the human spirit.

▼ Dr. Lindsay Campbell, Research Social Scientist

My favorite science experience is any time I get to conduct **semistructured interviews**. I enjoy having indepth conversations with individuals about their involvement with the urban environment. I've interviewed public officials, natural resource managers, nonprofit employees, private contractors, business owners, and volunteer **stewards**. I have asked people questions about a range of topics. These topics include living memorials, **stewardship** in New York City, urban forestry, and urban agriculture policies and practices. I learn a great deal from my **interviewees**. Much of my work involves analyzing, synthesizing, and translating what they share with me.

What Kind of Scientists Did This Research?

- **forest ecologist:** This scientist studies the relationship between things that live in forests with their living and nonliving environment.
- **research social scientist:** This scientist studies human societies and human behaviors.
- **senior extension associate:** This scientist develops and conducts natural resource or agricultural educational programs that address statewide or national issues.

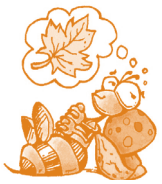
Thinking About Science

Science progresses in many ways. Sometimes, scientists use the written work of other scientists to help them think through a question. This process is called a literature review, and it is common in all scientific work. Scientists must know what other scientists have discovered so they can advance the discoveries further. When you do a research paper for school, you are often doing a literature review, just like scientists. Sometimes, they do the same experiment as other scientists to see if they get the same results.

Social scientists study the thoughts, feelings, beliefs, or actions of individuals or communities. In social sciences, scientists sometimes use case studies to better understand a question or idea. A case study is an examination of a single case as an example. Think about a student who wins a regional science fair. A social scientist might study this one student's experience as an example of other science fair winners' experiences.

In this study, the scientists were interested in ways that people remember past events and people who have died. The scientists wanted to explore why people plant trees and flowers to remember events and people. The scientists became familiar with what other scientists had written about why people plant trees and flowers. The scientists developed a possible explanation for why people plant trees and flowers to remember events and people. Then, the scientists conducted two case studies to investigate whether their ideas made sense in those real situations.

Thinking About the Environment



The natural environment means many things to people. Some of these meanings are revealed after a natural disturbance, such as a flood or a hurricane, or after a human-caused tragedy. Trees, flowers, and other plants are often planted so that events or people can be remembered. The scientists in this study were interested in how planting trees, flowers, and other plants helped people adjust after a human-caused tragedy or a natural disturbance. The people who designed the 9/11 Memorial in New York City, for example, described their design in this way:

> "Visitors will leave the everyday life of the city and enter into a sacred zone defined by a dense forest of 416 oak trees. Above the limbed-up trunks, a canopy of leaves will provide welcome shade in the heat of the summer and seasonal color in the fall. In the winter the sun will cast shadows through a light tracery of bare branches, and in spring, the trees will express the renewal of nature (figure 1). (From http://www.pwpla.com/national-911-memorial/landscape-design#/!/5132.)"

Figure 1.
In summer, trees offer beauty and shade at the 9/11 Memorial in New York City.
Photo by Mark Cordell.

Thinking About the Environment, continued.

In New York City, a planning committee asked citizens what kind of memorial they would like to see. The citizens made comments. Using these comments as a guide, the committee selected a team to design the 9/11 Memorial. A company was hired to plant the trees on the memorial site. Often, however, ordinary people get involved by planting trees and other plants to remember an event, a person, or even many people (figures 2a and 2b). Take a moment to think about your own life. Have you ever planted a tree, flower, or other plant to remember someone or something? If you have not, do you know anyone who has? What makes planting a tree or other plant for this reason special?

Figure 2a. Ken Cordell and Beth Kelley Zorbanos plant a tree in memory of Zorbanos' brother, Bill Kelley. Photo by Babs McDonald.

Figure 2b. A daughter planted and tends this rose garden in memory of her mother.

Photo by Lorraine Musselman.

Introduction

The scientists in this study were interested in what communities do after a natural disturbance or human-caused tragedy. In particular, they were curious about planting trees, flowers, and other plants as a way to remember the event or the people who were injured or lost. The scientists noticed that people surviving a human-caused tragedy or natural disturbance often planted trees, flowers, or other plants as a way to remember.

First, the scientists read what other scientists had written about this kind of tree and flower planting. Then, the scientists developed their own ideas about why people plant trees and flowers in memory of events and people. The scientists also developed ideas about what benefits tree planting and other similar actions have for the community.

The scientists thought that tree and flower planting might be a way for people to remember an event as a community of people. The scientists thought that trees, flowers, and other plants symbolized life and growth for the planters. Using trees and flowers as symbols might be a way for people to express hope and strength for the future. Tree and flower planting, therefore, may help communities be strong following a loss. The scientists thought that tree and flower planting was one way communities adapt to loss so that they can move forward while remembering the past (figure 3).

Figure 3. A steel beam from the World Trade Center was incorporated into this 9/11 Memorial at the International Peace Garden. The garden is located in North Dakota and Manitoba, Canada.

The scientists also thought that other things happen when people plant trees and flowers after a natural disturbance or human tragedy. The scientists thought that, without realizing it, people and communities learn new things by coming together. Some of the things they learn might be from people sharing the knowledge they have with others. Some of the things they learn might be learned as a group, without anyone teaching. When someone teaches or a group learns together, existing knowledge is shared with others or new knowledge is created by the community.

The scientists wanted to find out if their ideas might be correct. They conducted two case studies of communities that had survived a loss and had planted trees or flowers in memory of their loss.

Methods

Recall that the scientists started their research with a literature review. (Read "Thinking About Science" on page 12 if you have not already done so.) This review helped the scientists to develop ideas about why people plant trees or flowers in memory of a person or an event. These ideas, in turn, helped them focus their efforts to answer their research questions.

For their case studies, the scientists selected tree and flower planting after two events. The first event was in New York City. New York City lost 2,819 lives in the terrorist bombing of the World Trade Center on September 11, 2001. The second event occurred in New Orleans, Louisiana. In New Orleans, 1,836 people died and more than 850,000 homes were destroyed during, and in the aftermath of, Hurricane Katrina. The hurricane made landfall on August 29, 2005. The scientists studied tree and flower planting efforts by individuals and communities after these two events (figure 4).

The first effort the scientists studied was a national program. The Forest Service started this program. The program was called the *Living Memorials Project*. The scientists found information on 687 communities across the United States that planted gardens to remember those lost on September 11. The scientists asked

questions of people in 113 of these projects. The scientists wanted to understand why and how people planted trees, flowers, and other plants to remember the events of September 11, 2001 (figure 5).

Figure 4. What is the shape of this garden plan? Do you think this is a memorial garden for 9/11 or Hurricane Katrina? How do you know?
Courtesy of Dr. Keith Tidball.

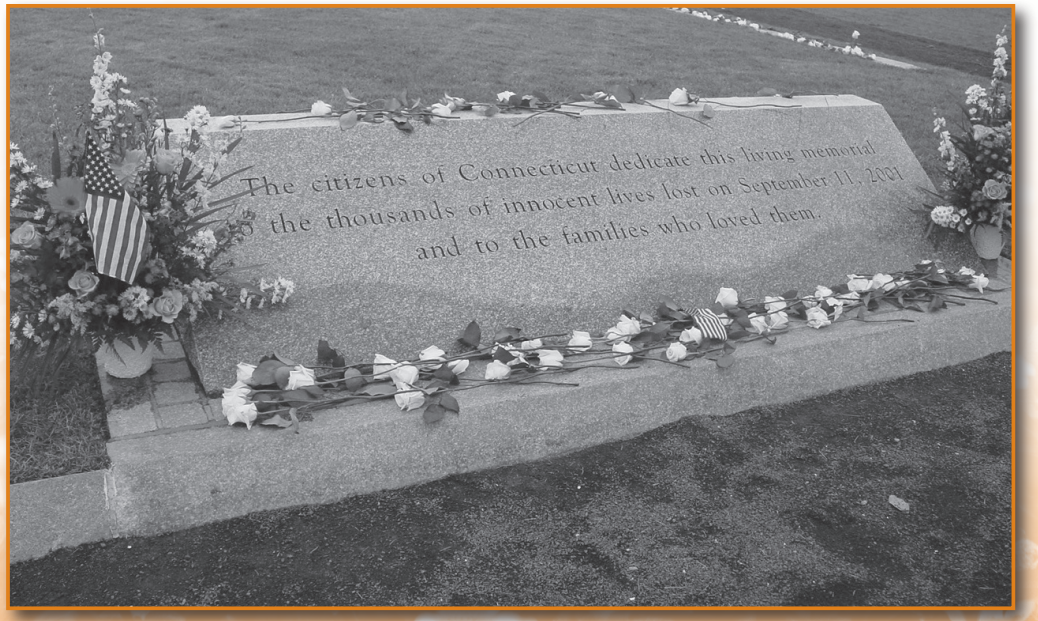


Figure 5. The citizens of Connecticut created this 9/11 memorial.

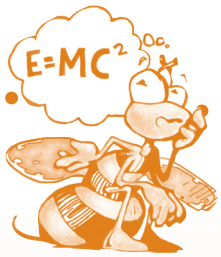
The second effort the scientists studied was actually that of a number of community groups that worked together. People in these groups planted more than 6,000 trees in New Orleans' hardest hit areas (figure 6). These groups formed after Hurricane Katrina. The groups' goal was to help New Orleans recover from the destruction and loss caused by the hurricane. The scientists asked questions of group members and citizens who planted trees as part of this effort.

The scientists audiotaped all questions and answers. The scientists kept the identity of each person who answered questions confidential (secret). The scientists listened to the tapes and typed the questions and answers into a computer. They then sorted the answers into categories so that they could understand better what they had been told. The scientists observed people planting and tending the gardens. The scientists also took photos while people worked in the gardens. Using observation and photos, and by asking questions, the scientists collected information about why people plant memorial gardens.

Figure 6. Community groups planted trees to remember the impact of Hurricane Katrina and the people lost because of the storm. The black and white buildings are **mausoleum** vaults containing the remains of unidentified or unclaimed victims of Hurricane Katrina. See figure 4 and find the locations of the mausoleums in the memorial garden plan. Courtesy of Dr. Keith Tidball.

Number Crunch

The scientists asked questions of people in 113 of 687 memorial garden projects. What percentage of the 687 projects did they address with their questions?



Reflection Section

Which of the two cities suffered from a natural disturbance? Which suffered from a human-caused tragedy?

Many scientists analyze numbers to answer their questions. For the two case studies, what did these social scientists analyze to answer their questions?

Findings

The scientists discovered that people felt planting trees, flowers, and other plants helped them heal from their loss. In New York City, some people planted sunflowers and daffodils (figure 7). One of these people said—

> "There is a power and healing that comes from digging in the dirt, planting new life, and nurturing its growth....Sunflowers make sense as one tall way to remember life and make it a bit better."

In New Orleans, people found tree planting was a way to remember what they had lost. One person said—

> "These trees we are planting might be a reminder of what we lost, so that we don't ever forget it and don't let that happen to us again."

The scientists discovered that people living in these communities learned how to plant and take care of the trees and flowers from **professionals** who work with plants and trees. This activity made people feel like they were rebuilding the community. These people created **communities of practice**. These communities of practice shared what they learned with others. This action served to strengthen the sense of community. The scientists believe that, after a loss, people feel an **innate** desire to plant trees, plants, and flowers.

Figure 7. People planted daffodils in public parks across New York City. Every spring, the daffodils help people remember the events of and the people who died on September 11, 2001. Photo by Babs McDonald.

Based on what some people told the scientists, do you think the scientists' beliefs about tree planting, loss, and community were correct? Why?

How do you think the scientists concluded that people learned new things from their tree and flower planting efforts?

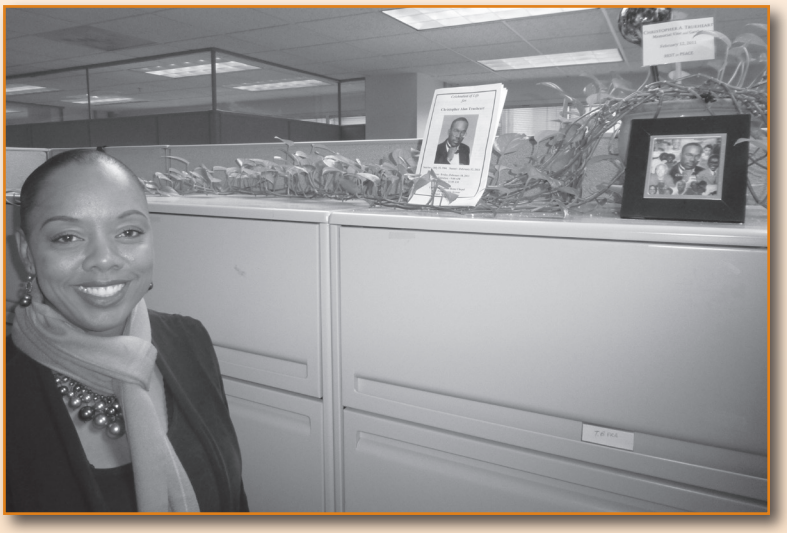
Discussion

In this research, the scientists thought that communities use tree and flower planting to help adapt to a loss. After people plant trees or flowers, they share their gardens with others. Working together creates communities of practice. Communities of practice enable people to continue working together.

Reflection Section

How do you think tree planting and flower planting helped people to adapt to their loss?

Describe one community of practice that exists in your school or learning environment.



Memorial gardens can be indoor gardens as well as outdoor gardens. Dr. Sharon Parker (pictured) and Dr. Kerry Britton tend this houseplant in memory of Christopher Trueheart.

Adapted from Tidball, K.G.; Krasny, M.E.; Svendsen, E.; Campbell, L.; and Helphand, K. (2010). Stewardship, learning, and memory in disaster resilience. Environmental Education Research. 16(5-6): 591–609. http://www.nrs.fs.fed.us/pubs/jrnl/2010/nrs_2010_tidball_001.pdf. (Accessed 9 February 2012).

Glossary

affirmation (a fər **mā** shən): A positive statement or a statement that gives assurance that something is true.

communities of practice: (kə **myü** nə tēs əv **prak** təs): Groups of people who share a concern or a passion for something they do and learn how to do it better as they work together.

innate (in **āt**): Existing in an individual from birth.

interviewee (**in** tər vyü **ē**): One who is interviewed; one who is asked questions.

mausoleum (**mȯ** sə **lē** əm): A stone building with places for entombment of the dead above ground.

professional (prə **fe** shə nəl): One that engages in a pursuit or activity as a line of work.

semistructured interview (**sə** mē **struk** chərd **in** tər vyü): An interview is a formal process of asking questions. A semistructured interview allows the interviewer to ask new questions based on previous answers.

steward (**stü** ərd): One who directs affairs. When referring to the environment, being a steward usually means that one is taking good care of the land.

stewardship (**stü** ərd ship): The careful and responsible management of something entrusted to one's care.

tribute (**tri** byüt): A gift or service showing respect, gratitude, or affection.

Accented syllables are in **bold.**
Marks and definitions are from http://www.merriam-webster.com.

Flower power

is a slogan that was used in America during the late 1960s and early 1970s as a symbol of nonviolence. Hippies, young people involved in the youth movement during that time, used the expression to transform Vietnam War protests into examples of peaceful events. Hippies embraced flower power by dressing in clothing with embroidered flowers and vibrant colors, wearing flowers in their hair, and distributing flowers to the public. These hippies became known as flower children. (From http://en.wikipedia.org/wiki/Flower_power)

If you are a Project Learning Tree-trained educator, you may also use the following activities as an added resource: Activity #5: Poet-Tree; or Activity #31: Plant a Tree.

Web Resources

Forest Service Living Memorials Project
http://www.livingmemorialsproject.net

Planting a Memorial Garden
http://pss.uvm.edu/ppp/articles/memorial.html

Green Is Good For You
http://www.apa.org/monitor/apr01/greengood.aspx

Kids F.A.C.E.®
http://www.kidsface.org