

4-H Eco-Stewardship

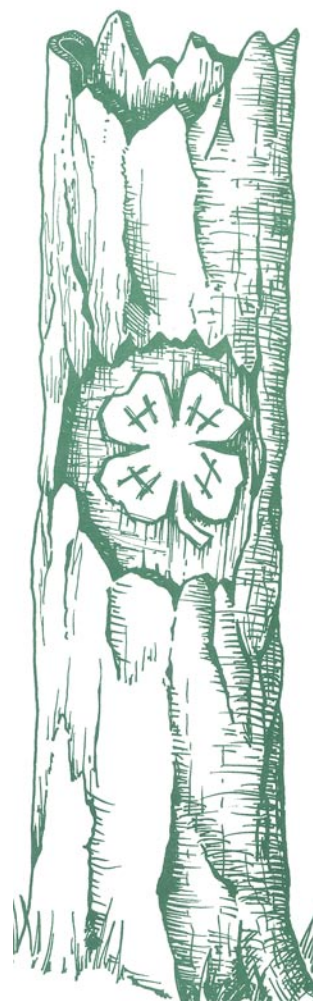
Resilient Youth – Sustainable Environment

This document was prepared by:

Farline, Nicholas A

Faini, Raymond J.

Powers, Kevin C.



2008



4-H ECO-STEWARDSHIP

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4-H Eco-Stewardship Program

Knowledge and Research Base



We believe that the most powerful method of learning is through the learning-by-doing approach, also known as experiential learning or adventure-based programming. In its simplest form, the model has three major components - Do, Reflect, Apply. Notice on the figure that “Reflect” and “Apply” are where the real learning occurs and is also where our staff brings the unique capabilities to the educational experience. (Source: WSU State 4-H web site, accessed 11/07/2008; <http://4h.wsu.edu/challenge/>)

Supporting research:

1. The methodology used as the foundation for the 4-H Eco-Stewardship Program is experiential education. According to the Association for Experiential Education (AEE) “Experiential education is a process through which a learner constructs knowledge, skill, and value from direct experiences.” Adventure-based programming is a philosophy of education that is framed around action, reflection, and application of experiences to life’s challenges. Experiential education is therefore a process through which learners are guided through carefully chosen activities or experiences that are supported by reflections and analyses, prompting the learner to make decisions, take initiative, and take responsibility for the outcomes (Itin, 1999). Throughout the experiential learning process, the learner is actively engaged in posing questions, investigating, experimenting, being curious, solving problems, assuming responsibility, being creative and constructing meaning. (AEE)
2. “4-H Challenge” is the WSU 4-H program that involves experiential activities, including ropes courses and portable applications. We follow this program as the foundation of our interaction with participants. The common focus of adventure-based programming and, therefore 4-H Challenge, centers on how participants communicate and cooperate with each other, solve problems, set goals, make decisions, and build healthy relationships (Zins, Bloodworth, Weissberg, & Walverg, 2004). Research suggests that outdoor adventure programs can reduce negative youth behavior by increasing feelings of positive self-perception, providing ways to gain knowledge, skills, and abilities, and increasing understanding of positive peer relationships (Garst, Schneider, & Baker, 2001). Insights into life’s challenges are gained through participation in activities that are designed using metaphors. The consequent discussion/debriefing draws out participant’s interactions, feelings and reactions with the intent of transferring the lessons

learned into increasingly pro-social behavioral responses (Alvarez & Stauffer, 2001). Many of the activities in 4-H Eco-Stewardship programming require individuals to work together in order to solve a problem or accomplish a task. Our participants describe their achievements as important because they are doing what they term “real work”, i.e. achieving outcomes that are durable and of consequence to their community. These outcomes can have tremendous benefits, such as preparing youth to be confident adults that are able to engage in their communities, make decisions and work well within a group.

Needs Assessment

The 4-H Eco-Stewardship program began in response to the recommendations of a regional advisory committee comprised of school administrators, educators and stakeholder representatives from local, state and federal natural resource management organizations and agencies. After examining data from school representatives, such as educational benchmarks and performance/participation indicators and demographic data from “Chelan Douglas Trends” web site (<http://www.chelandouglastrends.org/>) the committee agreed that many local youth, especially low income or minority youth, do not have opportunities to learn about forest ecosystems, effects of water quality degradation, aquifers, stream flow and other factors affecting forest and watershed health. Lack of understanding makes their use of forest resources for recreation very limited and when they do, the activity is often damaging to delicate forest ecosystems.

The committee identified the need for an alternative educational approach primarily focused on engaging the “At Risk” (as determined by school counselors, parents or probation officers) and low income youth in Chelan County which is more than 10 points higher than the state average (See Chart, Appendix A). Local educators, state and federal agencies, and other partners immediately recognized the value of developing life skills while connecting youth with their environment. They all realized that this effort would have far reaching benefits both economically and socially at the individual youth level, and in our communities and on our public lands.

Program Goals and Objectives

The 4-H Eco-Stewardship program strives to:

1. Develop positive life skills among local youth, such as self-confidence, communication, teamwork, and problem solving skills.
2. Teach fundamentals of natural resource stewardship and management (including basics of fish and wildlife ecology) to youth participants.
3. Enhance the existing science curriculum at local school districts with hands-on science activities.
4. Support local, state and federal agencies in achieving maintenance, recreation and monitoring goals in regional forest lands and to similarly assist communities in Chelan County.
5. Provide youth information and access to career and educational opportunities within the natural resource field.

6. Connect youth with nature and their communities through experiential learning activities and involvement in community-service based projects.

Target Audience

Regional and community demographics drive the program's composition:

- Primarily "at risk," minority / low-income youth in grade 8-12 in 8 rural communities in Chelan County, Washington. (See Appendix G for student selection process)

Delivery Methods

1. School Based: During the school year, program is jointly delivered by classroom teachers and 4-H Eco-Stewardship staff consisting of ~40 hours per semester in the classroom and ~50 hours per semester in field-based experiences. Approximately 250 students in 8 school districts are involved throughout the school year; another 2,800 students are reached in a variety of special programs with our partners. Staff utilize established curricula (e.g. Project WET, Project WILD, Project Learning Tree, Healthy Water Healthy People) delivered with the 4-H Challenge experiential learning method. Project work is directly tied to classroom objectives and Essential Academic Learning Requirements (EALRS) and is integral to student expectations.
 1. Eco-Stewardship staff collaborates with outside partners, like US Forest Service, Chelan County Public Utility District, Chelan County Dept. of Natural Resources, and others to develop relevant, real life activities such as needs assessment for sites analysis, information processing and report writing.
 2. Teachers assist other educational staff to develop cross curricula applications such as in English, computer technology, and art.
2. Summer Program: Activities are structured around an 8 hour, 5 day workweek for 7 weeks. Students become Chelan County employees and are paid a \$700 dollar stipend by the county. Participants also receive 2 academic credits, one in science and the other as an elective resulting from their successful participation in the program. The 28 student participants are broken into 4 groups that are involved in various natural resource activities. Supervisors pick up students at their respective high schools at 8:00 am and return them by 5:00 pm, Monday through Friday.
 1. Summer supervisors go through one month of training and orientation covering all aspects of the projects the students will be participating in. In addition, the staff participates in one week of extensive training on a ropes course to learn how to implement the experiential learning model and the 4-H Challenge methods for working with students.
 2. As a basis for group formation participants start the program with two days on a low ropes course using 4-H Challenge to learn the skills that form the foundation of their daily routine of group interaction. The centerpiece of their future working relationships is the "Full Value Contract" (FVC) (see Appendix F) which they develop for themselves, defining the nature of their interactions.

3. The next 3 days are spent in a large group project where they put what they have learned on the course, and their FVC into practice.
4. Over the next 5 weeks, they are split into 4 equal groups to work on infrastructure projects and educational outreach in collaboration with project partners. Scientists, managers and professional staff explain what needs to be done, the rationale for doing it, how to use the technical equipment used by the scientists and staff (such as GPS, CAD computers, water quality monitoring equipment, etc). Group's begins each day with a briefing to set their goals, examine safety requirements, and determine individual roles within the group.
5. The 6th week involves a 4-day, 3 night wilderness experience. This time has proven to be a transformational period for many students who have never been outside of their home and community.
6. During the final week, students spend one day each on the campuses of Washington State University and Eastern Washington University. They meet with professors, scientists, researchers, admissions officers and others. They have the opportunity to experience life in a dorm and on a large campus – experiences most of them have never had and could not imagine. They also prepare PowerPoint presentations and a still life display, using their journals and group discussions to create the story of their summer experiences. The students present their PowerPoint presentation and still life display at a community awards and recognition ceremony for agency partners, parents and project staff to celebrate the participants' accomplishments. The PowerPoint presentation is used later for presentations to school boards, county commissioners, agency partners, and statewide conferences. The still life display is shown at county fairs, high school and middle school presentations, statewide conferences of agency partners and 4-H educators, and local events and festivals.

Curricula and/or Educational Materials

4-H Eco-Stewardship utilizes many different educational curricula, including:

- WSU 4-H Challenge Program (Leaders Manual and Risk Management Tools)
- Project Wet
- Project Wild
- Project Learning Tree
- Healthy Water Healthy People

Background: School Districts and other youth development programs throughout Chelan County have used "4-H Challenge" since 1989 as enrichment to classroom activity and various student leadership programs to deliver life skills. WSU 4-H Challenge participants consistently communicated a stronger sense of feeling connected to their local community, an increased awareness of socially appropriate behaviors, improved teamwork abilities and heightened self-confidence. The 4-H Eco-Stewardship Program, based on 4-H Challenge, realizes these same benefits.

Our natural resource educational curriculum, therefore, includes a component to promote the development of positive life skills utilizing the WSU 4-H Challenge model.

Students engage in activities that assist in the development of clear and concise communication skills and effective decision-making and problem solving. In addition, opportunities are created for learning the value of cooperation with others in obtaining common goals through a shared experience and creating trusting relationships.

Teamwork and Collaborations

The 4-H Eco-Stewardship program has formed collaborative partnerships with local school districts, regional, state and federal agencies, and local community organizations. A list of partners can be found in Appendix B. We meet regularly with each of our agency, government and private organization partners to determine which projects will work best for them and for us, what the educational content will be for each activity and appropriateness of the activity for either summer or school-based program inclusion. School districts and classroom teachers are involved in the same process, insuring a good fit of the activity with the needs of the school and teacher regarding logistics, academic rigor, and curriculum sequencing.

The key element when working with non-school partners is to insure our students are not simply doing work the partner needs to have accomplished. This is a unique element of our approach with partners and is always central to our interactions with them. We insist that the partner provide professional staff to teach participants about the science that lies at the center of their activity and that they involve our students in scientific and technical aspects of the project. When first approached as a partner, this is the most difficult aspect for partners since it demands additional resources on their part. But without exception, every partner has indicated in evaluations that more work is accomplished by Eco-Stewardship crews than any other similar group they have dealt with in the past. The US Forest Service has had so much trouble with other youth work crews they have stopped doing that in our area. However, each year they contact 4-H Eco-Stewardship to be sure we will be working with them again.

Program Evaluation

Methods:

1. Pre-Post Survey: The 4-H Eco-Stewardship program has utilized a pre/post-program evaluation instrument for 6 years. Data from the evaluation is entered into an online system at WSU. The instrument examines progress in 7 critical life skills: decision-making; wise use of resources (personal and environmental); communication; accepting differences; leadership; useful/marketable skills (related to employment); self-responsibility. There are 21 specific behavioral indicators measuring progress in development of the Life Skills
2. Observations are collected on what students are doing with their lives as a result of their participation. Feedback from parents, teachers and counselors help determine behavior changes observed as a result of student's participation.
3. Parent surveys are sent out within 60 days of completion of each year's summer program.
4. Interviews are conducted with partners, including agencies, school counselors and administrators, within 45 days of conclusion of the summer program to ascertain what aspects of the program worked best or which need to be changed.

5. Phone Survey: To determine change over time, a phone survey covering the first 5 years' project participants was conducted by a WSU bachelor degree student intern who spoke Spanish. This was designed to insure participation by monolingual parents of Latino participants.
6. Gain in science knowledge is measured by student performance in field activities and classroom assessments, as reported by their teachers.

Process Evaluation:

1. Participant Input: after program completion, as part of our evaluation on Life Skills, participants are asked to help improve the program for the following year. They are asked what they liked or didn't like about the project and what they would change
2. Partner Debriefs: Process evaluation is included in detailed discussions, both during the program as well as upon completion. The focus is on the value of the collaboration in accomplishing their goals and meeting their needs. Any snags in interaction with our participants or supervisors are discussed. Suggested improvements are discussed for change in current strategies and for next year's program.

Outcome Evaluation

1. Evaluation results for each of the first 6 years of the project indicate that better than 95% of all participants report improvements in the measured life-skills (See Appendix C) that enable them to take control of their lives and develop positive life goals.
2. Each year, on average, 3-4 adjudicated youth participants finish the summer portion of the program, complete their court requirements and return to school. Research shows an annual savings of at least \$60K per juvenile not entering the juvenile justice system. On that basis, this program saves Chelan County Juvenile Justice \$180,000 - \$240,000 annually; over the past 6 years, that accounts for a savings of approximately \$1.2 million to the system.
3. Furthermore, community safety research from the Department of Juvenile Justice indicates that actions encouraging the social development of children, youth, and families reduce delinquent behavior resulting in returns as high as \$7.16 for every dollar spent (Sansfacon and Welch, 1999). This suggests a potential annual return to Chelan County as high as \$1.32 million in delinquency reduction benefits from the Eco-Stewardship program.
4. An added measure of success has been realized- that of recruitment and hiring of program participants by local agencies, especially the USFS, for their summer employment opportunities in the STEP program. USFS and other partners who hire our participants give these youth special consideration since they have proved they can perform duties similar to employees during the summer.
5. As a direct result of their involvement in the Eco-Stewardship program approximately 10 of our participants, who were not planning on going to college, have chosen to enroll in regional colleges and universities to pursue degrees in the natural resource field.

Communication to Stakeholders:

1. 4-H Eco-Stewardship communicates through several media outlets including newspaper and radio interviews. (See Appendices D, E)
2. Program participants give presentations to school boards, partner agency management teams, county commissioners, and their own schools.
3. Still life display boards are set up at conferences throughout the state (State 4-H Conferences, E3 Summit, Washington State Association of Counties), county fairs, and local events and festivals.
4. Annual project summaries are given to county commissioners.
5. Participants were invited to discuss the merits of this project at the National Association of County's (NACo) in 2004 where they also met with State's Congressional delegation in Washington D.C.

Evidence of Sustainability

1. Local entrepreneurs who are strong advocates for natural resource education have seen our successes and are expressing a desire to put their financial resources into funding this program for the long term. Examples include: the Icicle Fund, and the Harriett Bullitt Foundation.
2. Several corporations and local businesses are stepping up to integrate our project with their environmental goals and mandates. Examples include: Waste Management of Greater Wenatchee; Alcoa foundation; Subaru of North America; Sleeping Lady Retreat Center.
3. The Associate V.P and Director of WSU Extension, Dr. Linda Fox, has made continued funding of 4-H Eco Stewardship Program a priority, which has brought the WSU Foundation and the Washington 4-H Foundation into the role of helping to develop strategies for long term funding.
4. We continue to seek grants from state and federal agencies and private foundations that have goals and objectives similar to ours. An example of this effort is the \$45,000 "No Child Left Inside" grant that we recently received from Washington State Parks Department. Our proposal ranked third out of over 250 applications.

Replicability

1. Similarities of 4-H and 4-H Challenge programs across the country make it highly feasible for other Extension offices to duplicate this effort.
2. United States Forest Service is organized similarly throughout the country and local administration views the 4-H Eco-Stewardship Program as a potential national model for natural resource education.
3. The Leavenworth National Fish Hatchery is the only fish hatchery in the country that has an alternative high school housed on their grounds, and they are looking to model their educational delivery based on 4-H Eco-Stewardship Program. They are encouraging similar partnership in other states.
4. Schools throughout the country are under similar mandates to provide natural resource education, and have similar shortcomings in their ability to deliver curricula on their

own. Partnerships with Extension could work similarly in other states following the model we have developed.

Rationale and Importance of Program

The 4-H Eco-Stewardship Program is a unique educational program reaching approximately 3,000 students in North Central Washington,. The primary purpose is to develop life skills and engage local youth in “Outdoor Classrooms” where they are presented with learning opportunities related to the environment and natural resources surrounding their communities. Through this program, students develop a deeper understanding of the relationship between healthy forests and healthy communities.

Our program has demonstrated the power of combining university youth development research and curriculum with local schools’ needs to deliver relevant high quality natural resource education. Schools award academic credits to our participants for participation in 4-H Eco-Stewardship – something not done with any other non-school science program. This is evidence of the importance, and relevance they place on the value and merit of this program.

The 4-H Eco-Stewardship program has had an estimated economic impact in Chelan County of more than \$2.5 million over 7 years. It is important because of the impact it has on students’ lives as evidenced by: students who were members of gangs before but not after completing the program; adjudicated participants who did not become repeat offenders as a result of their 4-H Eco-Stewardship participation; parents who tell us of the change this program has made in their son or daughter’s attitude and behaviors as a result of participating in our program; by teachers who call to ask us, “What did you do to Mary this summer? I can’t believe the change.”

Teachers have clearly indicated their inability to provide quality environmental or natural resource education curricula because of either their own lack of understanding of this field of study or limited knowledge of the resources available in the area. 4-H Eco-Stewardship provides a vital link to the broader community of educators, scientists and professionals in the immediate area who simply needed the coordination and structure we provide to allow them to efficiently and effectively partner with classroom teachers.

The national awards garnered by the program include:

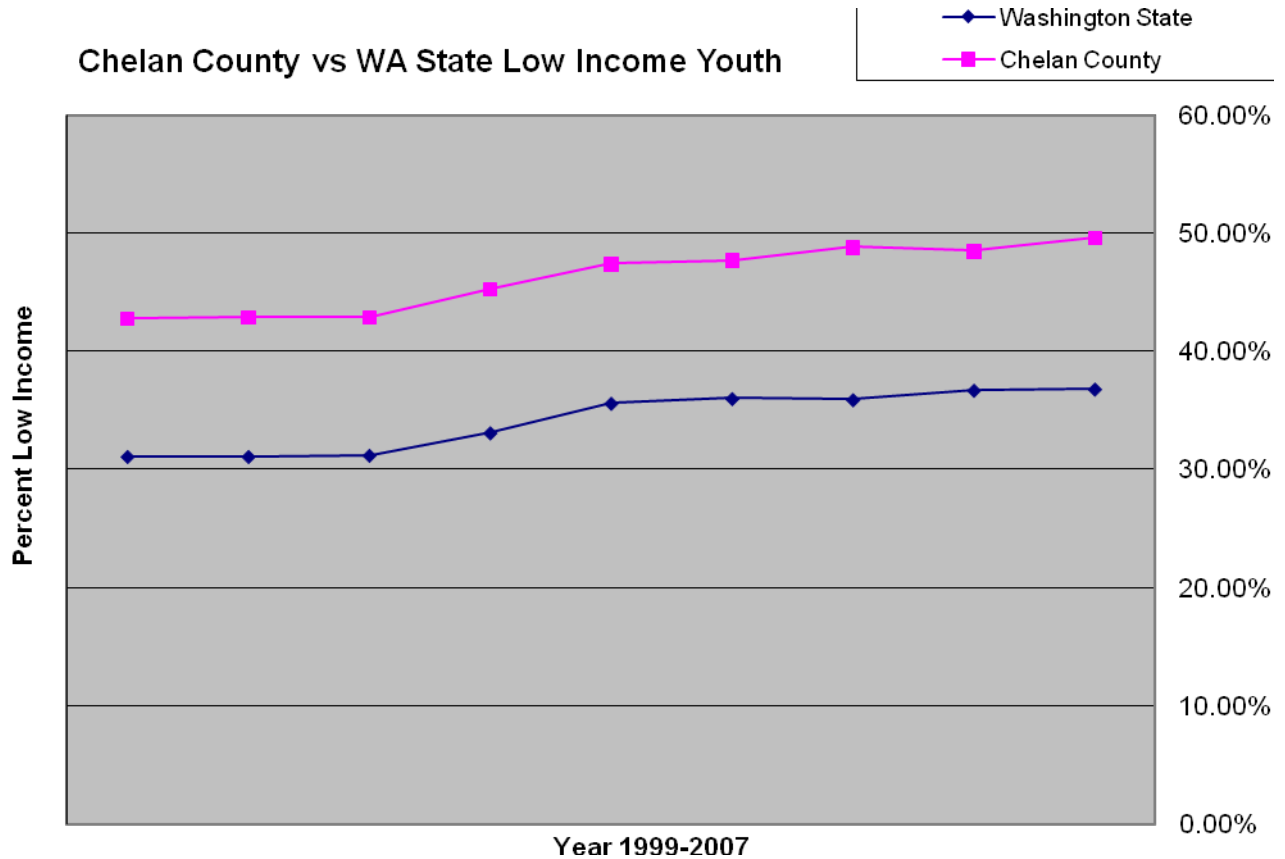
- 2008 Recipient of the National 4-H “Program of Distinction” Award
- US Forest Service “Caring for the Land” award for outstanding environmental education programming in Region 6.
- National Association of Counties (NACo) achievement award for educational excellence, involving youth in local government and service to community.

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APPENDICES

Appendix A: Chart



Appendix B: Program Partners

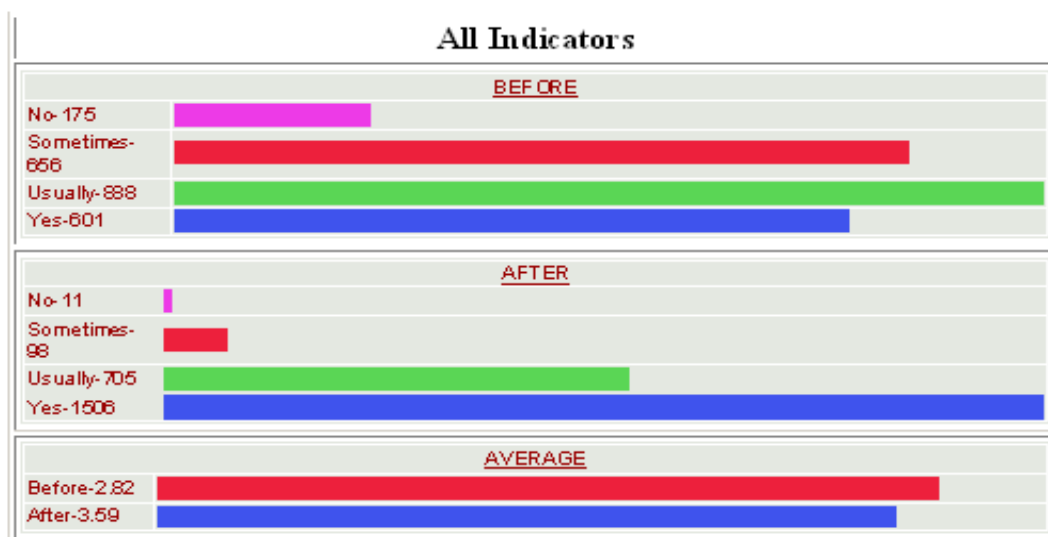
- **Barn Beach Reserve:** Environmental education programs related to environment, arts, culture and history, Leavenworth Birdfest, Audubon programs
- **Chelan County Conservation District:** Watershed projects, water quality and in-stream flow monitoring, riparian restoration projects, interpretive education sites
- **Chelan County Natural Resources Department Watershed:** Monitoring and research, riparian re-vegetation projects, 12anadromous fish studies, regional watershed planning efforts
- **Chelan County Noxious Weed Board:** Noxious weed educational programs and weed eradication projects
- **Chelan County Public Utility District:** Fish & wildlife ecology, fish bypass project, public land use, salmon & mule deer studies, habitat enhancement, hydroelectric energy education, diversion projects for 12anadromous fish, conservation issues
- **Columbia Fire Breaks Interpretive Center:** Wildfire ecology and educational projects, interpretive center development, and wildfire prevention & restoration projects

- **Dr. Don Rolfs:** Lepidopterist, experiential educator, Chumstick Mountain butterfly project, wilderness moth studies and honeybee research project
- **Eastern Washington University:** Faculty lecture and field experiences related to Outdoor Recreation, Therapeutic Recreation and Outdoor Recreation Management degree programs, university campus orientation
- **Mark Oswood:** Entomologist, macro-invertebrate studies, water quality, watershed educational programs
- **Mule Deer Foundation:** Mule Deer research project in collaboration with Washington State University, Washington State Department of Fish & Wildlife, University of Washington, Inland Game Council studying nutritional and reproductive health of regional herds
- **Roots & Shoots:** Icicle River Middle School habitat project and Vanne-Goodall Bluebird Trail project in support of local Jane Goodall environmental programs
- **Seattle Seahawks:** Youth life skill development, motivational events with Coach Mike Holmgren and Seattle Seahawk players
- **Trout Unlimited:** Habitat restoration, educational programs, youth angling education, senior citizen programs
- **Turnbull Wildlife Refuge:** Wildlife observation and monitoring, history of the Lake Missoula –Spokane Flood, related environmental education programs
- **U.S. Bureau of Reclamation:** Hydroelectric energy, water quality, salmon and fish habitat
- **U.S. Forest Service:** Fish & wildlife education, GPS/GIS technology, wildlife monitoring, stream surveys, riparian area restoration, wilderness education, fire ecology, invasive & noxious weeds management, forest and timber management, interpretive trail projects, campgrounds and forest multi-use education
- **U.S. Fish & Wildlife Service:** Anadromous fish education, salmon research projects, “Salmon Festival”, wildlife observations, interpretive trails, Bat project, hatchery operations
- **Washington State Department of Fish & Wildlife:** Project Mule Deer monitoring project, management of deer foraging habitat, off stream migration and spawning bed habitat development, dry land water resource development and habitat enhancement for upland birds, GPS documentation of monitored sites, youth angler education program, Nature Mapping

Appendix C: Life Skills Evaluation Report

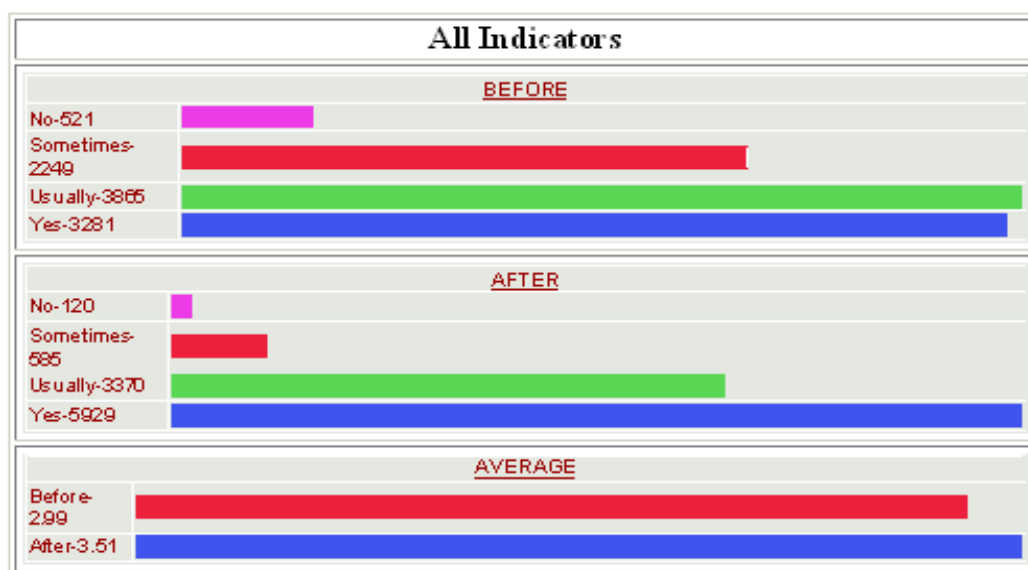
4-H Eco Stewardship Program 2003-2007

Percent of participants who made gains from pre-program to post-program: 95.53%



Washington State Results 2003-2007

Percent of participants who made gains from pre-program to post-program: 81.10%



Appendix D: News Paper Article on Summer program

SPECIAL NOTE: 4-H Eco-Stewardship was known as "4-H Forestry Education" until 2008

A 'girly-girl' reformed: Working the wild land crew

[By Rachel Schleif, World staff writer](#)

Posted October 25, 2007



Irma Farias, former Manson Apple Blossom queen who worked on a U.S. Forest Service fire crew this summer, watches a prescribed burn she helped start in Derby Canyon near Peshastin on Wednesday. (World photo/Don Seabrook)

LEAVENWORTH — Former pageant queen Irma Farias lugged a dripping diesel torch up the forest ridge Wednesday, ready to burn it all. Her ensemble: an oversized, school-bus-yellow shirt, dark-green work pants and thick boots. No makeup.

Irma Farias helps set a prescribed burn with a drip torch up Derby Canyon near Peshastin on Wednesday. "You get really focused on knowing who you are instead of just thinking of yourself as a girl," Farias said. "You're doing the same work as everyone else every day." At 19, Farias is a self-described "girly girl" reformed. Her crew burned a test acre near Derby Canyon on Wednesday, about 12 miles from Leavenworth, and called it quits. The 100-acre prescribed burn was canceled due to forecasted high winds.

"You see how the burn area shifted," Farias said, pointing to a pile of burning debris. The flames crept away from the center, charring the hillside three feet away. Irma Farias, former Manson Apple Blossom queen who worked on a U.S. Forest Service fire crew this summer, changed from a self-described "girly-girl" to a Forest Service firefighter. She helped set a prescribed burn up Derby Canyon near Peshastin on Wednesday. Farias joined the U.S. Forest Service last April through a Forest Service program for college students called Student Temporary Employment Program. Through STEP, Farias toured each department: botany, timber, wildlife, trails and fire crew, which she chose. Her parents thought she was joking, Farias said. "They thought I would be doing office work or answering phones," she said. "In a Hispanic family, you're taught to work hard and be like a doctor or nurse or something indoors."

Her father is a mechanic and her mother cleans Chelan hotel rooms. Farias is the middle of five children. Two years ago, she coasted with a C in Susi Bennett's biology class at Manson High School. She gabbed with friends and daydreamed about her next shopping excursion, she said. "She told me a lot of students didn't like it (biology) because all it was sitting down and textbooks. I was one of those students," Farias said. Bennett recommended her to the 4-H

Forestry Education summer program for high school credits and a small stipend from Washington State University Extension. The seven-week program transformed her, Farias said.

The former Manson Apple Blossom Festival queen learned to catch salmon with her bare hands, dig trails and work without showering for days. Eventually she ditched the makeup and fingernail polish. Farias tried to skip the three-day wilderness trip during the 4-H forestry program, said program director Kevin Powers. "She couldn't bring her mirror, and there were no electrical outlets for her hair dryer; that came as a bit of a rude shock to her," Powers said. "Once she got out there and pushed her boundaries, we all sort of watched her blossom. To me, I look at her as one of those success stories." Powers took Farias and other students to Washington, D.C., last fall to speak with senators and high-ranking officials about outdoor education. She was poised and articulate, Powers said. But in a group of her peers, she's shy. She wouldn't talk among her 20 crewmen and ate lunch alone for the first few weeks, said fire crew member Thomas Goble, also in the STEP program. "Eventually she came out of her shell," Goble said. "This is like a second family. We look out for each other." "At first I shrunk down because I felt they were better than I was," Farias said. "But going out there and doing it changed my mind." Farias carried her 45-pound pack next to her crewmates at the Domke Fire this summer and later scraped fire lines at a brush fire near Chelan. "You get really focused on knowing who you are instead of just thinking of yourself as a girl," Farias said. "You're doing the same work as everyone else every day. You have to earn your respect, and that's the same for everyone." The last day of her fire season is Friday.

In January, she will attend Wenatchee Valley College and plans to transfer to Washington State University for a natural resources degree.

Student Temporary Employment Program (byline)

The predominately white-male U.S. Forest Service is trying to reach out to minority workers through STEP and the 4-H Forestry program. The agency's temporary work force is 10 percent minority, said spokeswoman Maureen Hanson. Its permanent work force is 14 percent minority. "We've got an awful long way to go before we have a work force that represents society at large," Hanson said. "We've made great progress. Locally, we continue to identify outreach sources and become more active with students. Our goal is to make sure they apply." Rachel Schleif: 664-7139

Appendix E: News Paper Article on School-based Program

SPECIAL NOTE: 4-H Eco-Stewardship was known as "4-H Forestry Education" until 2008

Article published May 10, 2007

Bringing out the Bats Students build houses for nocturnal flyers

By [Rachel Schleif](#), World staff writer



Ramon Ramirez, 17, a Cascade High School student, makes bat houses at Leavenworth National Fish Hatchery on Wednesday. (World photo/Don Seabrook)

LEAVENWORTH -- One brown bat can eat 1,000 mosquitoes an hour. Pesticides can kill just as many, but with more damage and costs.

Six science students at Cascade High School are building three bat hotels, big enough for 50 bats each, near the Leavenworth Fish Hatchery. The project is an experiment in natural pest control. If it works, the project will curb pesticide use, improve fish habitat and provide relief from biting skeeters and the threat of West Nile virus. "We'll just see how well things go," said 18-year-old Blaine Dawson. "We don't want to make too many until we see if the bats like our designs." They plan to finish the wooden boxes and hang them along the Icicle Creek Nature Trail by June. The students spend their advanced biology period once a week working on the project for class.

"It's hands-on experience," said Pedro Barrera, 19. "I'm going to remember that I was a part of this project. I learn by doing it, instead of learning it out of a book."

The project started with a partnership between the school, Washington State University Extension and the U.S. Department of Fish and Wildlife. The advanced science students could choose between four field projects: water quality, tree surveying, river bank vegetation work and fish and wildlife habitat. The six students did not know what they were signing up for when they chose to work on fish and wildlife habitat. Barrera said he associated bats with rabies. Dawson knew bats were pests that liked to nest in chimneys and houses. The boys said they warmed up to bats as they researched more, especially when they read the mosquito statistic. After research, the team staked out three spots in the first quarter-mile along the Icicle Creek Nature Trail behind the hatchery. They looked for tall trees and snags at least 25 feet above ground for protection against predators, such as raccoons, Dawson said. The students also chose open fields near slow-moving waters where mosquitoes frequent.

Ramon Ramirez and Hugo Vasquez, both 17, worked on the first bat hotel in the fish hatchery wood shop Wednesday afternoon. The students attached wire mesh to the box's ceiling for the bats to hang from and sleep. The bottom is open, like a Japanese lantern. Inside the box, the bats will squeeze in one-inch chambers separated by the wood planks.

"This is the first baby step," said Cody Stitt, a program assistant for the WSU Extension 4-H

Forestry Education Program. He is the students' main advisor for the project.

The project also includes community education, including radio interviews, interpretive trail signs and presentations to school and fish hatchery administrators, Stitt said.

"Eventually we want to gather tracking data -- find out what kind of bat species we attract, and what type of habitat they like," Stitt said. The project will continue for years. Each class will build on the work. "A big part of this project is looking at the sustainability piece, what can we do to carry on year after year," said Kevin Powers, forestry program director.

The 4-H Forestry Education Program offers class projects in Cashmere and Leavenworth.

Powers said he plans to expand the projects into the Entiat and Manson school districts in the next few years.

Appendix F: FULL VALUE CONTRACT ⁽¹⁾

**This full value contract asks you to agree to these five commitments as
guidelines for group participation.**

Because I care about myself and my group, I agree:

To Work Together: with my group in order to achieve both my own goals and the goals of the group. I will support the group in achieving our goals.

To Be Safe, Emotionally and Physically: To take care of myself and my group's physical and emotional safety. This includes having a positive attitude, respecting each other, avoiding putdowns, and following directions.

To Give & Receive Honest Feedback/ To Listen: To tell others what I am thinking and feeling and to listen to what others have to say to me.

To Grow: To try new things and to step out of my comfort circle and take appropriate risks which I can learn from.

To Have FUN!: To play and have fun in a safe manner and with a positive attitude.

(1) NOTE: *The facilitator normally develops this agreement with the students, allowing them to express their ideas and priorities for interaction in their own words. The above verbiage expresses the minimum of what the facilitator is looking for when working with her/his group.*

Appendix G: STUDENT SELECTION PROCESS

Students are both self-nominated and referred to the program by teachers, counselors, probation officers and administrators. An application is submitted by the student which is reviewed by a selection committee for recommendation. As part of their review process input is received from school administrators and staff as well as from other references provided by the applicant. The selection team seeks input to two questions; A. Is this student good for the program? B. Is this program good for the student?