

2019 Annual Report of Accomplishments and Results

AMERICAN SAMOA
AMERICAN SAMOA COMMUNITY COLLEGE (ASCC)
AGRICULTURE, COMMUNITY AND NATURAL RESOURCES (ACNR) DIVISION

**I. Report Overview**

The NIFA reviewer will refer to the executive summary submitted in your Plan of Work. Use this space to provide updates to your state or institutions as needed.

<p><b>1. Executive Summary (Optional)</b></p> <p>ASCC ACNR is reporting on its Planned Programs listed in the 2017 Plan of Work: 1. Families, Youth, &amp; Communities; 2. Food Security; 3. Human Health &amp; Wellness; and 4. Ecosystem. We have provided updates to some of the descriptions and also significant updates to other sections of the Plan in order to more directly respond to the information requested by NIFA. Please refer to our 2021 Plan of Work for all updates.</p> <p>In 2019, ACNR continued to serve the clientele through its research and extension programs in partnership with government agencies and non-governmental organizations at the local, regional, national, and international levels.</p> <p>Some of the successful projects in 2019 include:</p> <ol style="list-style-type: none"><li>1. Development of growing media for nursery and hydroponic crop production using locally-sourced coir-based media</li><li>2. Taro (<i>Colocasia esculenta</i>) breeding and selection program</li><li>3. Plant Clinic Service</li><li>4. Detection, mapping, and control of invasive little fire ant (<i>Wasmannia auropunctata</i>) incursion</li><li>5. Human disease vector operational research</li><li>6. Laboratory production of healthy host scale insects to support rearing of potential biological control agents</li><li>7. Forest Stewardship Program</li><li>8. Watershed Management</li><li>9. Basic Sewing Program</li><li>10. Youth Development</li></ol>
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Factors that affected program/project implementation include:

1. Shortage of academically and professionally qualified local personnel to fill ACNR scientists, specialists, research assistants, extension agents and technician positions.
2. Delays in the ASCC procurement process, especially when most of the needed materials, supplies, equipment, scientific apparatus, and related resources must be ordered from the United States
3. Limited air and sea transportation services delayed the delivery of ACNR's programs and services to the Manu'a islands
4. Delay in settling the ASCC Land Grant Experiment Station land boundary disputes resulted in limited access for research and extension personnel to clear land for demonstration and research plots given the encroachment of unauthorized people
5. Need for translators to conduct workshops and translate materials in Tongan, Filipino, Chinese, and other Asian and Pacific Island languages as the population of these ethnic groups increase
6. ASCC cost containment measures due to local funding shortfalls resulted in freeze on salary step annual increments increasing difficulty of recruiting and retaining qualified personnel.
7. 2018 tropical cyclone Gita damages to ASCC ACNR research and extension greenhouses and field plots

**Merit and Scientific Peer Review Processes**

The NIFA reviewer will refer to your Plan of Work. Use this space to provide updates as needed or activities that you would like to bring to NIFA’s attention.

Process	Updates
1. The <u>Merit Review Process</u>	No change in the merit review process. Please refer to the 2021 Plan of Work.
2. The <u>Scientific Peer Review Process</u>	No change in the scientific peer review process. Please refer to the 2021 Plan of Work.

**II. Stakeholder Input**

The NIFA reviewer will refer to your Plan of Work. Use this space to provide updates as needed or activities that you would like to bring to NIFA’s attention.

Stakeholder Input Aspects	Updates
1. Actions taken to seek stakeholder input that encouraged their participation with a brief explanation	Please refer to the 2021 Plan of Work.
2. Methods to identify individuals and groups and brief explanation.	Please refer to the 2021 Plan of Work.
3. Methods for collecting stakeholder input and brief explanation.	Please refer to the 2021 Plan of Work.
4. A Statement of how the input will be considered and brief explanation of what you learned from your stakeholders.	<p>Please refer to the 2021 Plan of Work for updates on how the inputs will be considered.</p> <p>In FY 2019, ACNR collected stakeholders’ inputs from 641 clients visited by Agriculture Extension Agents and participants of 10 farm safety and pesticides workshops, 390 visitors to ACNR, 335 aquaculture clients, 466 participants of five outreach workshops, 909 youth in 12 4-H workshops, 6,200 participants in 29 nutrition workshops and 16 basic sewing classes, 1,780 participants in 49 Forestry workshops, and 655 participants of 10 Wellness Center workshops.</p> <p>Some of the priority areas/issues learned from stakeholders include: need to extend and deliver research and extension programs and services to the outer islands (Aunu’u &amp; Manu’a islands); need to offer more youth programs in the STEAM (Science, Technology, Engineering, Art, &amp; Mathematics) areas; need to establish a community garden project at ACNR to provide access to clients who have limited access to land to start vegetable gardens; need for new fruit tree varieties; need to control invasive species (little fire ant (<i>Wasmannia auropunctata</i>), myna birds (<i>Acridotheres tristis</i> and <i>A. fuscus</i>), Mexican rubber tree (<i>Castilla elastica</i>); need to continue basic and advanced sewing</p>

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	<p>programs for homemakers and youth; need to develop more nutritious recipes using local produce; need to revive the 4-H Foundation; need to secure grants to assist clients with food and agriculture, environment, natural resources, health and wellness, youth development, and related issues/areas; and need to develop programs to assist clients prepare before, during, and after a disaster (natural or man-made). Overall, stakeholders are asking for more and new programs, services, and resources (human &amp; capital) to meet clients' needs. ACNR research and extension programs are addressing many of the aforementioned needs and issues given the available human, financial, and physical resources.</p>
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III. Planned Program Table of Contents

No.	Program Name in order of appearance
1.	Families, Youth and Communities
2.	Food Security
3.	Health and Wellness
4.	Ecosystem

**V. Planned Program Activities and Accomplishments**

Please provide information for activities that represent the best work of your institution(s). See Section V of the Guidance for information on what to include in the qualitative outcomes or impact statements. Add additional rows to convey additional accomplishments. You may expand each row as needed.

No.	Title or Activity Description	Outcome/Impact Statement	Planned Program Name/No.
1.	4-H Youth Workshops	<p><b>Issue (Who cares and why):</b>                      Resource management (poverty), parenting, culture, and youth at risk issues continued to be major areas of concern in American Samoa. According to the Statistical yearbook by the American Samoa Department of Commerce (ASDOC), 54.5% (2010) of American Samoa families fall below the US poverty level. The American Samoa Department of Education (DOE) Standard Base Assessment indicates that more than 50% of public-school students fall below the basic level of reading and math (SY 2015-16 AS Report Card). According to the 2011 U.S. Centers for Disease Control and Prevention American Samoa YRBBS, 15.2% of high school students smoked marijuana one or more times during their life. In 2011, 28.8% were offered, sold, or given an illegal drug on school property compared to 14.3% in 1993. School enrollment dropped in SY2015 from 17,337 in SY14 to 16,648.</p> <p><b>What has been done?</b>                      In 2019, 909 youth participated in 12 4-H workshops in arts &amp; crafts, traditional/cultural arts (elei printing), and STEAM (Science, Technology, Engineering, Art, Mathematics) areas. Moreover, the 4-H program hosted three summer camps attended by 190 students; conducted four after school programs to 543 students; and hosted five tours for 176 students, 15 teachers and seven parents.</p> <p><b>Results:</b>                      About 85% or 998 of 4-H members and participants acquired knowledge in the STEAM areas and developed positive self-development, and life skills concepts and practices such as decision making and problem-solving,</p>	1. Families, Youth and Communities

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		creative thinking and critical thinking, communication and interpersonal, intellectual curiosity, flexibility, and decision-making using data. The STEAM partnership workshop supported school curriculums in the schools and will enable students to become STEAM literate, STEAM college, STEAM Career and STEAM Trades Ready.	
2.	Basic Sewing Workshop	<p><b>Issue (Who cares and why):</b> Resource management (poverty), parenting, culture, and youth at risk issues continued to be major areas of concern in American Samoa. According to the Statistical yearbook by the ASDOC, 54.5% (2010) of American Samoa families are considered poor and below the US poverty level.</p> <p><b>What has been done?</b> In 2019, FCS conducted 16 sewing workshops attended by 222 participants. All workshop participants received certificates of completion at the end of the basic sewing program.</p> <p><b>Results:</b> In 2019, 222 participants received certificates of completion in the sewing program. All participants in the sewing programs acquired knowledge and developed skills in sewing and resource management. All participants were able to tailor and sew their children, spouses, and own clothes. Five participants (2%) of the workshops' participants reported that they started their own sewing business and 20 participants (10%) who are homemakers purchased their own sewing machines. More than 50% of homemakers reported that they are saving money and 3% are making money from their small business selling outfits and elei (cultural pattern) printing fabrics.</p>	1. Families, Youth and Communities
3.	Farm Safety and Pesticide Training	<p><b>Issue (Who cares and why):</b> In FY2019, entry of illegal pesticides continues to be a challenge for local regulatory agencies as farmers continued to use illegal pesticides. Also, improper handling of pesticides before, during, and after usage continues to be an issue for the safety of applicators. The impacts of farm accidents on children is another issue.</p> <p><b>What has been done?</b></p>	2. Food Security

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		<p>The Agriculture Extension program conducted five pesticides safety workshops for 70 farmers. Moreover, Agriculture Extension program conducted five farm safety workshops that were attended by more than 500 students and farmers. The primary objective of farm safety workshops is to educate children about safety issues in and around farms and homes.</p> <p><b>Results:</b>          About 97% of farmers and applicators who attended the Pesticides safety workshops and trainings received certifications and acquired knowledge in pesticides laws, uses, safety, and also develop skills in applying pesticides safely. Also, 90% of students who attended the Farm Safety workshops acquired knowledge on farm safety concepts, procedures, and practices. The Agriculture Extension program assisted farmers and local government agencies with issues concerning farm safety and produce quality.</p>	
4.	<p>Development of growing media for nursery and hydroponic crop production using local materials to replace expensive imported peat-based media</p>	<p><b>Issue (Who cares and why):</b>          Hydroponic and nursery farmers are interested in locally-sourced coir-based media to reduce high production costs from use of imported peat-based media.</p> <p><b>What has been done:</b>          A trial on the use of locally produced coconut coir for use in seedling production has been completed. In addition, one farmer is evaluating use of local coir in his non-circulating hydroponic system for lettuce production. Another farmer has successfully used local coir in a bag drip hydroponic system to grow cucumbers and tomatoes.</p> <p><b>Results:</b> In nutrient-film technique (NFT) and non-circulating hydroponic systems, media is used only for seedling production and the amount needed is small compared to drip systems. For farmers using NFT and non-circulating systems, though the cost for using local coir is less, the ease of access and reduced labor associated with using packaged peat-based medium keeps them from totally switching from imported peat to local coir. For farmers using drip systems, the savings of switching from imported media to locally produced coir are large. On-farm trials demonstrating results and savings may persuade these farmers to switch.</p>	2. Food Security

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5.	Taro improvement through conventional breeding and selection	<p><b>Issue (Who cares and why):</b> Taro has great cultural and nutritional importance as the main traditional staple crop in American Samoa. Development of superior varieties through plant breeding can improve resilience of subsistence farms and profitability of commercial production while providing a higher quality product for local consumers.</p> <p><b>What has been done:</b> Micro-propagation in the tissue culture lab of newly developed varieties and those selected for field trials continues. Field propagation is also in progress. Randomized complete block trials will be conducted once planting material becomes sufficient. Taste tests are ongoing to identify acceptable varieties. To date, ten taste tests of over 56 varieties have been conducted. Eighteen ACNR varieties have been chosen for field trials.</p> <p><b>Results:</b> No varieties have been released to farmers thus far. Propagation of new varieties is ongoing. Trials on selected advanced lines will begin this year. Addition of new taro varieties superior to those currently available to farmers can improve all aspects of production, and the advent on the local market of varieties with superior eating quality will help maintain this nutritional traditional staple as a valued part of the daily diet of American Samoans.</p>	2. Food Security
6.	Vegetable Gardening	<p><b>Issue (Who cares and Why):</b> American Samoans rank among the highest in the world in rates of overweight and obesity. Hence, there is a great need in American Samoa to increase consumption of fruits and vegetables to help address the issue of obesity and non-communicable disease. Farmers continued to grow vegetable varieties that are beneficial for their health, providing food, and generating an income for the family.</p> <p><b>What has been done?</b> The Agriculture Extension outreach programs continued to provide seeds/seedlings to the community, schools and 4-H clubs for vegetable gardening. The agents also conducted follow-up visits to farmers, schools, and producers. The Extension office continues to sell seeds of improved vegetable varieties at an affordable price to the public to encourage</p>	2. Food Security

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		<p>vegetable farming. Vegetable seedlings are given to interested farmers and clients free of charge.</p> <p><b>Results:</b> The Agriculture Extension program distributed 9,025 seedlings to 641 farmers at no cost. As a result, 56 (9%) farmers started new vegetable gardens; and more than 400 (62%) farmers reported that they harvested vegetables; prepared nutritious meals; saved money; and sold excess vegetables to generate revenue.</p>	
8.	Animal Management	<p><b>Issue (Who cares and Why):</b> Inbreeding of swine continues to be a major issue with swine farmers in 2019. Inbreeding is a serious cause of concern, since it results in low productivity when no new blood is introduced. Hence, there is a need to introduce diversity in the local pig gene pool to prevent inbreeding. Also, there is still a need to address the pig waste management problem in American Samoa.</p> <p><b>What has been done?</b> The Agriculture Extension program distributed piglets from swine artificial insemination (AI) to 120 pig farmers to address the inbreeding problem. ACNR continues to use the ASEPA funded piggery to demonstrate the four recommended waste management systems to farmers, students and the general public. The program assisted farmers with issues concerning piggery management and inbreeding.</p> <p><b>Results:</b> Agriculture Extension Agents conducted 30 farm visitations and distributed piglets from AI to more than 120 pig farmers. As a result, 120 pig farmers improved their stocks by the introduction of AI piglets to address the inbreeding problem. Livestock Agents also encouraged farmers who received AI piglets to share and exchange the AI boars with other farmers to improve their stocks.</p>	2. Food Security
9.	Plant Clinic Service	<p><b>Issue (Who cares and why):</b> When plants on a farm, in a forest, or in a home garden have symptoms of pest or disease attack, it sometimes requires special expertise to determine the cause and recommend the most appropriate solution. ASCC</p>	2. Food Security

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		<p>ACNR makes that expertise available to island stakeholders through its Plant Clinic service.</p> <p><b>What has been done:</b> Through the ASCC ACNR Plant Clinic, ACNR scientists provide plant pest and disease diagnostic assistance to extension agents, other agencies, farmers, and the general public. The Clinic also provides a mechanism to detect and verify new pest introductions. As a member of the National Plant Diagnostic Network, ASCC ACNR can access regional and national diagnostics expertise if required. All records are entered into the NPDN national database.</p> <p><b>Results:</b> Correct diagnosis is the critical first step in plant pest and disease management. The Plant Clinic services rendered during the fiscal year helped ensure that clients got the information needed to address plant problems in effective and safe, environmentally-sound, ways. In addition to the helpful control recommendations, the ACNR diagnosticians identified three pests which appear to be new records for American Samoa. These are awaiting confirmation from taxon specialists. Sixteen records were uploaded to the national database.</p>	
10.	Pest surveillance	<p><b>Issue (Who cares and why):</b> American Samoa’s island ecosystems and agricultural production are highly vulnerable to accidental introduction, establishment, and spread of exotic invasive plant pests and diseases. It is therefore important to establish and maintain exotic pest surveillance programs so new invaders can be contained and controlled or managed effectively before they become established and widespread.</p> <p><b>What has been done:</b> In previous years, the USDA APHIS Cooperative Agricultural Pest Survey program has supported the American Samoa Department of Agriculture, working together with ASCC ACNR to conduct ongoing surveillance for exotic fruit flies, citrus greening disease, and imported fire ants. Unfortunately, funding was not received in 2019. However less formal surveillance efforts resulted in the first ever detection of little fire ants</p>	2. Food Security

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		<p>(<i>Wasmannia auropunctata</i>) in the archipelago. Three other first detections of less concerning hemipteran insect pests also were made which await authoritative confirmation.</p> <p><b>Results:</b> The outcome of the battle against little fire ants' establishment in American Samoa remains uncertain, but it appears likely that early detection has provided a reasonable chance for controlling the ants before they establish and spread further.</p>	
11.	Aquaculture Feed Facility	<p><b>Issue (Who cares and why):</b> The high cost and limited availability of commercial feeds for Tilapia fish farms continue to be the main issue for fish farmers in 2019.</p> <p><b>What has been done?</b> The Center for Sustainable Integrated Agriculture and Aquaculture (CSIAA) continues to maintain equipment and sustain the production of fish feeds to meet the demand by fish farmers. The feed production services are available to local fish farmers at no cost.</p> <p><b>Results:</b> Farmers continued to make use of the feed facilities at ACNR to produce feed for tilapia fish farms. In 2019, the CSIAA produced 777 pounds of tilapia feeds. Fish farmers saved money and increased fish production for ACNR is helping with the feed supply. Moreover, fish farmers continued to assist their families by providing fish for family functions as well as generating revenues from sales of excess fish.</p>	2. Food Security
12.	Healthy Living Education	<p><b>Issue: (Who cares and why):</b> Obesity, overweight, poor nutrition, non-communicable disease, and food safety continue to be major issues for both adults and youth in American Samoa. There is a continued need for more workshops on nutrition, vegetable gardening, and wellness and healthy living to educate the community about healthier lifestyles.</p> <p><b>What has been done?</b> The FCS and EFNEP programs conducted 41 workshops in nutrition and healthy living to 5, 918 participants in the schools and the community. Given the prevalence of obesity and nutrition related problems in</p>	3. Health and Wellness

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		<p>American Samoa, nutrition education is clearly "key" and definitely a top priority in changing cultural attitudes, norms and practices related to food and nutrition.</p> <p><b>Results:</b>                  About 75% of 5,918 participants in the workshops acquired knowledge and developed skills in preparing nutritious, balanced, and safe meals; vegetable gardening; food safety; physical activity and exercise; and wellness. Participants also reported consumption of more than one serving of fruits and vegetables a day.</p>	
13.	Human disease vector operational research	<p><b>Issue (Who cares and why):</b>                  Mosquito-borne illnesses are an ongoing threat to the people of American Samoa. Recent outbreaks of chikungunya, dengue, and Zika virus have sickened thousands of residents. Filariasis remains endemic in the islands. Development of improved rapid diagnostic tests and drug combinations which provide long-term suppression of transmission led the World Health Organization to initiate a worldwide effort to eradicate lymphatic filariasis. American Samoa is a participant in this effort, and the first rounds of mass drug treatment succeeded reducing infection prevalence to 1-2% of the population. Subsequent recrudescence, however, has stimulated a second mass drug program, this time using a three-drug combination, more effective than the two-drug combination used previously. Ongoing assessments of parasite prevalence in both human and mosquito populations are a critical part of the eradication program. In addition, research to increase efficiency of these assessments by targeting alternative mosquito species or employing different traps is critical to improve program sustainability. The major disease vectors in American Samoa are container-breeding species of <i>Aedes</i>. In other places, these species have also been found breeding in septic tanks. The majority of homes in American Samoa utilize septic tanks, so it is important to investigate this habitat as a potential source of disease carrying mosquitoes in the territory.</p> <p><b>What has been done:</b></p>	3. Health and Wellness

		<p>ASCC ACNR conducted mosquito trapping at random households throughout the main island of Tutuila to assess prevalence of the filarial parasite in the mosquito vector population prior to initiation of the mass drug administration program. At the same time, comparisons were made between two trap types and two vector species as alternative targets for use in the assessments. The over 24,000 female mosquitoes collected in the traps were identified, sorted, pooled, and sent to partners at Smith College in Massachusetts USA to assay for the presence of the filarial parasite. The mosquitoes are also being tested for presence of selected arboviruses. To assess vector production from septic tanks, a total of 34 septic tanks were inspected and emergence cages placed on those with openings to the outside to monitor daily production of mosquitoes.</p> <p><b>Results:</b></p> <p>Data analysis is ongoing, but preliminary results indicate a parasite prevalence in the major vector of approximately 1%, substantially higher than that found in 2011. Comparison of the two traps and two mosquito species used indicated that the loss of sensitivity due to lower overall prevalence in the non-vector <i>Culex quinquefasciatus</i> probably outweighs the benefit of the ability of the gravid traps to efficiently capture large numbers of this species thus achieving narrower confidence intervals around the prevalence point estimate. The increasing parasite prevalence in mosquito vectors shows that a renewed filariasis eradication effort is clearly warranted. Comparison of prevalence found in future collections with this one will be used to document the efficacy and progress of the ongoing filariasis eradication program. Unfortunately, the method remains laborious due to the relative inefficiency of the trap that is most effective for the target mosquito vector. Testing of the same mosquito pools for presence of arboviruses is ongoing. Results from the septic tank study indicated that septics are not likely a significant source of the species of mosquitoes known to vector disease locally, however a few substandard tanks produced very large numbers of <i>Culex quinquefasciatus</i>, a species which can be a major nuisance, but which is not known to be an important vector in American Samoa. The information was shared with the local</p>	
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		waste water authority which has an ongoing program of assistance for low-income families to replace substandard tanks with modern, well-sealed ones.	
14.	Sustained, uniform production of healthy host scale insects to support rearing of potential biological control agents	<p><b>Issue (Who cares and why):</b>            American Samoa’s Rose Atoll National Wildlife Refuge serves as an important breeding site for 12 species of seabirds. In recent decades the island’s vegetation has been severely disrupted by heavy infestations of a sap-sucking scale insect on the native trees. Experiences on other isolated islands, and the apparent absence of any other related non-target insects on the island suggest the scale may be a suitable target for classical biological control. Two species of natural enemy of the scale insect which have been used as biological control agents against it elsewhere have been found to occur on American Samoa’s Tutuila island. The next steps are to complete a detailed risk-benefit analysis for review by local and federal stakeholder agencies and the local community and to develop locally adapted procedures for mass rearing healthy natural enemies suitable for introduction to the atoll.</p> <p><b>What has been done:</b>            Several varieties of bell pepper were evaluated for suitability for seedling production in the greenhouse and subsequent ability to thrive sufficiently to support scale insect development in laboratory growth chambers. <i>Pulvinaria urbicola</i> scale insects were collected from the field and their identity confirmed. Scales were established on the bell peppers in the growth chambers and maintained continuously through multiple generations. The rearing is ongoing.</p> <p><b>Results:</b>            Most bell pepper varieties tested exhibited extensive formation of intumescence on the young leaves shortly after transfer to the growth chamber from the greenhouse. The cause is unclear, but perhaps related to the lighting used in the growth chambers. One variety, however, performed well despite some intumescence formation. This variety also proved suitable for sustained maintenance of the colony of scale insects. The next steps will be to utilize this bell-pepper/scale insect rearing</p>	4. Ecosystems

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		<p>system to mass produce the natural enemies that are being assessed for possible introduction to Rose Atoll to control the scale insects causing so much damage to the native trees there.</p>	
<p>15.</p>	<p>Detection, mapping, and control of invasive little fire ant incursion</p>	<p><b>Issue (Who cares and why):</b>                  The little fire ant (<i>Wasmannia auropunctata</i>) is acknowledged as one of the most troublesome of the world’s invasive insect species due to its painful and itchy stings disrupting daily life, recreation, and agricultural production for people in rural areas. It also harms native fauna and flora through competition, predation, and mutualisms with sap-sucking hemipteran insect herbivores. The ant was detected in American Samoa for the first time in late 2018. The infestations are few and limited in extent, and effective control methods developed at the University of Hawai’i Ant Lab have proven effective in Hawai’i, so eradication of these populations may be possible. The great economic and environmental cost to American Samoa should little fire ant establish and spread provided ample justification and motivation to launch a substantial effort to control the ant in the territory.</p> <p><b>What has been done:</b>                  Television, radio and newspaper, along with videos, flyers, and in-person presentations to schools, agencies, and other organizations have raised public awareness and motivated people to help watch out for and report any occurrences of little fire ants on the island. As a result, detection surveys were conducted at a total of 80 sites, and further delimitation surveys completed at six sites found to have little fire ant infestations. With support from the U.S. Forest Service and the U.S. Fish and Wildlife Service, as well as NIFA, control programs have been initiated at all six sites using methods developed by the University of Hawaii’s Hawai’i Ant Lab. ACNR also took advantage of the situation to document indirect impacts of little fire ants on local crops via the ants’ mutualistic relationships with sap-sucking insects.</p> <p><b>Results:</b>                  Detailed knowledge of the extent of the little fire ant infestations has facilitated planning, budgeting, and initiation of control efforts on all the</p>	<p>4. Ecosystems</p>

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		<p>known infestations. Control of little fire ants is a long-term process, and the effort is ongoing. Efficacy assessments are also continuing, but initial results are promising with for example, a 94% reduction in little fire ant prevalence already observed following commencement of treatments on the largest infestation. Challenges remain, however, and much more work lies ahead. Efforts to inform the public must be continued, along with detection surveys to spot any additional infestations. Control via multiple applications of gel and granular baits must also continue at all the sites for a period of at least one year based on experiences with little fire ants elsewhere. The study on indirect effects of little fire ants on crops found higher levels of taro planthopper on taro within little fire ant infested areas than outside those areas. More work is required to explain the differences observed. In addition, a short-term exclusion experiment documented higher rates of melon aphid population increase on cucumbers exposed to little fire ants than on those protected from the ants. That difference appeared to result at least in part from much lower parasitism rates on aphids tended by the little fire ants than on those from which little fire ants were excluded. This further evidence of adverse impacts from little fire ants further supports the investment of substantial resources to keep the ant from establishing permanently in the territory.</p>	
16.	Watershed Management	<p><b>Issue (Who cares and why):</b> Stream pollution from pig wastes, trash, sedimentation, invasive species, soil erosion, and human activities are major threats to fresh water quality in American Samoa. These threats also affect both freshwater and saltwater marine habitats such as mangroves and coral reefs. American Samoa's wetlands, including coastal mangroves and freshwater marshes, are threatened by forest conversion and land filling for development. Heavy sedimentation and nutrient overload from agriculture and concrete infrastructure also affect the islands' marine habitats and water quality.</p> <p><b>What has been done?</b> Forestry staff conducted 38 workshops on conservation, climate change, land management planning, and how to be good stewards. A total of 10.29 tons of solid wastes in these watersheds' main streams were</p>	4. Ecosystems

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		<p>removed. A total of 19 native trees were planted in riparian zones and 25 vetiver grasses planted on the stream banks. More than 700 youth members, volunteers, partnered agencies, and ASCC-ACNR staff members participated in this project. At the end of each activity, an outreach presentation stressing the importance of protecting and maintaining our forests and watershed was conducted.</p> <p><b>Results:</b> Improved watersheds and coastal areas in 3 villages. Continued partnership and collaboration with local and federal environmental agencies to provide outreach services for the community.</p>	
17.	Forest Stewardship Program	<p><b>Issue (Who cares and why):</b> Landowners are in need of assistance in maintaining their forests and property from the effects of sea level rise, invasive species, and more. Floods from heavy rainfall have caused landslides and fallen trees in residential areas, especially those located on the mountains. Heavy rainfall and storms have also caused streams to overflow which causes soil erosion on the stream corridors and high turbidity in coastal waters. Landowners need trees and grasses for shade, beautification, preventing erosion, and more.</p> <p><b>What has been done</b> The Forestry program provided technical assistance to 11 landowners by providing trees, vetiver grass, and best management practices for their lands. A total of 261 native trees and 84 vetiver grass slips were distributed to 11 landowners and 37 clients. The Forestry Program conducted 38 outreach presentations to 21 schools, 9 churches, and 8 businesses. A total of 1,197 attendees participated in these outreach activities. The Forestry Program also planted 31 trees in various areas such as schools, churches, and private lands. A total of 464 students, 40 teachers, and 24 parents visited the Forestry Greenhouse to learn about the importance of trees.</p> <p><b>Results</b></p>	4. Ecosystems

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		<p>Landowners and farmers are working cooperatively with the Forestry program on managing their forestland and related issues. The Forestry Program has helped develop 11 management plans and maps for each landowner. This includes technical assistance from the program for using vetiver grass in their agro-forestry projects in their sloped agro-forest lands for soil stabilization. The program staff continues to work closely with the GIS specialist in documenting client land uses and plans.</p>	
<p>18.</p>	<p>Invasive Species Management Program</p>	<p><b>Issue (Who cares and Why)</b>                  In 2012, a State-wide Assessment and Resource Strategy for Forest Resources (SWARS) pointed out the rapid growth and spread of exotic invasive plants in American Samoa rainforest. Invasive species are displacing native plants and wildlife habitats across the island. Invasive species are becoming more common due to abandoned agriculture, poor environmental stewardship, frequent storms, natural disasters, and lack of awareness.</p> <p><b>What has been done</b>                  The Cooperative Forest Health Protection and Invasive Plants Management Program focused on the Mexican rubber tree (<i>Castilla elastica</i>) for the fiscal year. Staff collected data, applied herbicide, and mechanically removed trees found in the villages of Maloata and Tafuna. A total of 49 trees were controlled at both villages. Forest health assessments have been conducted in other villages and the Manu’a Islands to determine the extent of infested areas and plan control programs.</p> <p><b>Results</b>                  Forestry program staff and the GIS Specialist surveyed the four sites which totaled 22 acres. With the 22 acres surveyed, 11 acres were treated. As part of this process, Forestry staff conducted follow-up visits with management activities such as removing invasive plants; reforestation with native and traditional/cultural plants, including <i>Intsia bijuga</i> (ifilele), <i>Terminalia cattappa</i> (tropical almond), and <i>Flueggea flexuosa</i> (poumuli); and providing follow-up management recommendations.</p>	<p>4. Ecosystems</p>

<p>19.</p>	<p>Tree Planting Activities</p>	<p><b>Issue (Who cares and Why):</b>                  Native trees are central to our unique ecosystems in American Samoa, including the cloud forests of Manu'a, the mangrove forests, Pala Lagoon, wetlands and coastal forests of Tutuila and the lowland forest. Trees provide refuge to wildlife, as well as protecting our water resources and soil by slowing soil erosion. It is imperative to the work of the Forestry Program to conduct educational workshops and seminars in the community through church youth groups, public and private schools, and villages to share the knowledge of how important trees are to our daily lives. It is important to remind the community that trees can help mitigate the effects of climate change, providing coolness, shade and erosion prevention.</p> <p><b>What has been done?</b>                  All three Forestry programs (Forest Stewardship, Forest Health and Invasive Plants, and Urban and Community Forestry) combined to conduct a summer camp with eight local environmental agencies and provided 11 school tours to the Forestry Plots. As stated in the Forest Stewardship Program section, a total of 31 trees were planted in various areas across American Samoa. Prior to the tree planting activity, awareness presentations pertaining to environmental and natural resources, the importance of being good stewards and landowners, forest health issues related to invasive species, and others were discussed amongst the community.</p> <p><b>Results</b>                  The Forestry program and eight local environmental agencies successfully hosted a summer camp serving 40 participants. The Forestry program continued to provide information, demonstrations, and outreach to the community. About 1,700 participants increased their knowledge through educational workshops and activities. The Forestry Program will work with the villages and agencies in implementing more tree projects that will address stormwater issues, sea level rise, and serve the human needs.</p>	<p>4. Ecosystems</p>
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