Forest TEAM Program





## 1. Program or Unit Description

Students learn to actively manage Hawai'i's native forest ecosystems, grow native plants, establish agroforestry operations, use Global Positioning Systems (GPS), and Geographic Information Systems (GIS). Internships give students on-the-job training with potential employers.

What is the target student or service population? – High school graduates and non-traditional students looking for a second career.

### 2. Analysis of the Program/Unit

The 2020 Annual Report of Program Data Quantitative Indicators provided an overall cautionary status for the Forest TEAM Program Health. These indicators come from the following program characteristics: Demand, Efficiency, Effectiveness, Perkins and Performance.

The Demand Indicator was ranked as Healthy during the last three years, where the annual number of aligned state positions were between the low and high 50s. The related county positions also fell into a consistent range between 14 and 17. Over the last three years, the number of majors has been in the mid to low 20s, which is at a good level to meet the local demand for this market. Average enrollment for program classes was seven to eight students, which is low but reflects the size of the program and the positions available in the community.

Program Efficiency was categorized as Cautionary due primarily to low enrollment and fill rates. The ratio of FTE BOR appointed faculty to majors was between 1:24 and 1:20, which is a good balance to make sure the students have good instruction and advising; however, approximately half of the declared majors have not started taking program classes. The cost of student semester hours was high (\$519 in FY 16/17) but was offset by external federal funds brought into the program.

Effectiveness of the program was also listed as Cautionary, presumably due to low persistence from fall to fall semesters in FY 16/17 and 17/18, where only 46% and 35% of the students continued on to the next school year. Some of these losses were countered by the success of the graduates during this time. In FY 16/17, our data shows that there were six graduates instead of four. Of these, there were three transfers to four-year schools, (two to UHH, one to UHM) and one into the ASNS program at HawCC, while another graduate found full time employment with the USFS. One of the UHH transfers also found full time employment with OHA. In FY 17/18, of the four graduates, two transferred to four-year institutions; one to UHH, who is now employed by DLNR and another to California State Humboldt. The other two graduates are full time technicians, one with the USFS and the other with DLNR. In FY 18/19, one graduate transferred to UHM College of Natural Resource Management and another found full time employment with the National Park Service. A third student was hired as a full-time technician with the USFS and a fourth found employment with a plant breeding company in Colorado.

During this reporting period, the Perkins Indicators for Technical Skills Attainment (1P1) and Completion (2P1) were met. However, Student Retention or Transfer (3P1) missed the goal by approximately 15% and Student Placement (4P1) by approximately six percent. As for placement, this result seems misleading, as, from our data, 100% of the program graduates during this reporting time either transferred to a four-year or another two-year degree or found employment in their field. The program was also labelled as not meeting the Non-Traditional Indicators for participation and completion (5P1 and 5P2). This is the first time that our program has not met these indicators, and appears to be due to low female enrollment during this analysis period. According to our student rosters, we had ratios of female to total students at 6/24 (25%) in 2016/17, 3/20 (15%) in 2017/18 and 5/22 (22%) in 2018/19. Which according to our calculation equates to an average of 20.6% females in the program during this reporting period. This is still, nonetheless, below the goal of 23.5%. This value seems to cycle over the years.

An indication of Non-Traditional Participation not used in this analysis, are the number of Native Hawaiian students in the program. For the TEAM program, this percent averaged at 41.3% over the three-year period, which indicates that we are supporting Native Hawaiian Involvement with forest management. The program's attraction to native Hawaiians can also be seen from the Performance Indicators, which shows that all five of our awarded degrees and certificates in 2016/17 were for students of Hawaiian ancestry, as well as eight out of 10 in 2017/18 and two out of seven in 2018/19.

The Annual Review Program Data listed the Forest TEAM program as NOT STEM for all three years, which is in error. This is a BOR appointed Associate of SCIENCE degree program, which requires chemical, biological and ecological sciences as part of its core courses along with higher math, forestry, field surveying and computer mapping in its curriculum. This recurring error has been corrected several times in the past, but for some unknown reason, the system goes back to assigning the program to a non-STEM designation, presumably because it is connected with CTE programs.

The Forest TEAM Program ARPD sheets can be found by linking to the following webpages:

FY 2017 FY 2018 FY 2019 (note for the FY 2019 you will have to select Hawaii campus and connect to the Tropical Ecosystem and Agroforestry Management Program to see the data)

During this reporting period, the Forest TEAM Program was involved with three USDA grant proposals in collaboration with the AG and HLS Programs. All of these proposals were funded and materials and supplies needed for agriculture and forestry instruction purchased, including a 12-passenger van. The program coordinated 17 student internships who trained with eight different forest management agencies. A memorandum of agreement was established between the TEAM Program and the USFS to create two to three work-study positions during the academic year.

The Forest TEAM club was very active during this time, participating with several community plant-growing and conservation projects and school presentations and attended the International Arborists Convention in Honolulu. Two TEAM students also travelled with faculty to Juneau, Alaska to help teach a forest measurements class to High School Students. The program also hosted

an AG summit and three-day Big Island Tour for 20 students from UHM, LeeCC, WinCC, KauCC and UHH.

In 2017, a "Cultural Resources Management" Certificate of Competence was proposed to the Curriculum Committee that would have combined several of the most useful management classes in the HLS and TEAM programs. Unfortunately, the proposal was not approved by the CRC as they said it needed approval from the UH system beforehand. In 2018, a program modification was made to improve the options for students to transfer to four-year institutions in the UH system. These modifications included adding new math and chemistry courses and a special forestry topics course as program electives. In 2019, GEOG 180/L, GIS in Forest Ecosystems and lab, were modified to become GEOG 270/L as recommended by the UHH Geography department so that it would articulate with their courses. A proposal to designate GEOG 170 as a General Education DB course and its lab as a DY course was submitted to the GEC committee and was approved. In 2020, a new course was proposed in collaboration with EDvance titled, "Unmanned Aerial Systems Flight Basics" (SCI 107), which is a modification of a TEAM special topics course on the use of drones in forest mapping. The results of this latter proposal are not yet known.

The last TEAM Program Comprehensive Review was conducted in 2017, and a summary of its action plan is outlined below in **bold**.

The TEAM program action plan is to improve in three areas: first, to increase recruitment into the program, 2<sup>nd</sup> to improve program efficiency so that transfer to a four-year school and 3<sup>rd</sup> increase placement.

### AY 2018

**Recruitment: TEAM** faculty and staff will coordinate with area high schools to inform them about the program. A new student worker will be hired to specialize in outreach coordination.

The forest TEAM Program participated in six career fairs and environmental events on campus and visited nine high schools for their career activities. Forestry student workers and faculty staffed the information booths where new brochures were distributed. In 2018, a 3-month casual hire for recruitment was funded. However, due to a very slow hiring process, the recruiter was not hired until the end of the spring semester, which limited their contact ability with high schools. Nonetheless, some good contacts with HS counselors were established.

Program efficiency: Efficiency will be enhanced by making modifications that will allow TEAM courses to be available to other programs such as AG, HWST and Natural Science. It is hoped that it will enhance their learning experience and increase classroom fill rates. Courses in the TEAM program will be modified so that they will have better articulation with UH Hilo and Mānoa.

As noted above, the Program and several courses were modified to improve articulation with other campuses. The HLS and TEAM Certificate of Competence that was not approved would have helped with low enrollment, and needs to be proposed to the UH system for approval.

Placement: The TEAM program faculty will work with the advisory board to keep up to date with changes in the workforce and modify curriculum and internship opportunities as necessary. The program will also work with other agricultural and forestry related committees in the community and attend agriculture and conservation conferences to seek out new career pathways.

The TEAM Program has an Advisory Council of 14 members from Federal, State, Private and Educational Sectors. Meetings take place annually and the members are very helpful with curriculum advice and keeping the Program up to date with trends in industry, land management and research issues. They have also helped to establish internship opportunities and sometimes fulltime placement for graduates. In addition, the Program faculty have participated with many community-based workforce and training committees. Some of these include the Hamakua Workforce Committee, GIS Certificate Committee, Unmanned Aerial Vehicle Training Committee, HawCC Farm Relocation Committee and the Panaewa Keaukaha Farmers Association. The Program director attends annual Agricultural meetings with the USDA UH AG Education consortium to strengthen collaboration among programs and seek new funding opportunities.

### AY 2019

# Evaluate changes in program enrollment, efficiency and placement and emphasize areas that need more support.

In AY 2019, enrollment had increased by two students since 2018 and based on club participation, was gaining in popularity just before the Covid-19 pandemic hit in the spring 2020 semester. Transfer of students to UHH was going very smoothly and placement of graduates was successful as noted above.

### AY 2020

# If courses remain low enrolled, the program will consider expanding marketing strategies to students outside of Hawaii county and possibly combining forces with other small programs such as Natural Science and offering courses every other year to meet enrollment quotas.

At the end of the spring 2020 semester, it became apparent that the Program would have great difficulty effectively offering hands on field courses via distance education. So it was decided to take a one-year pandemic break and not offer TEAM courses until fall 2021. It was also decided to switch to a cohort system and teach courses every other year to increase enrollment.

### 3. Program Learning Outcomes or Unit/Service Outcomes

a) List of the Program Learning Outcomes or Unit/Service Outcomes

- 1. Apply basic ecosystem concepts to natural resource management
- 2. Use an understanding of general scientific concepts in design of forestry systems.
- 3. Use knowledge of applicable laws and regulations to make decisions about managing ecosystems
- 4. Apply effective interpersonal and communication skills
- 5. Recognize, collect, and interpret field data
- 6. Apply effective management practices to commercial or conservation efforts

b) List the Program Learning Outcomes or Unit/Service Outcomes that have been assessed in the period of this Comprehensive Review. \* indicates that the courses were assessed but the CLOs were not uploaded to Kuali.

| GEOG 170/L | Forest Ecosystem Surveying                  | Spring 2018 |
|------------|---|-------------|
| AG 245/L   | Silviculture and Tropical Plant Propagation | Spring 2018 |
| AG 190v    | Internship                                  | Fall 2019*  |
| AG 192     | Special Topics in Forest Ecosystem Mgt.     | Fall 2019*  |

c) Discuss the assessment results from the period of this Comprehensive Review.

For all course's artifacts assessed, meeting expectations were set at 70% for successfully answering questions or completing assignments that pertained to a specific CLO, exceeding expectations was set at 90% and partially meeting expectations set at 60%.

GEOG 170 and GEOG 170L – Forest Ecosystem Surveying and Lab - assessed in the spring 2018 semester using five student artifacts in lecture and five artifacts in lab.

CLO 1- Learn and understand about forest parameters such as area, basal area, structure, light penetration and species composition - aligned with PLO 5

CLO 2 - Be able to use basic field surveying equipment such as a hand held compass, transect tape, clinometer, densitometer, transit, theodolite and total station -aligned with PLO 1 and 6

CLO 3 - Understand how to set up transects and plots for forest surveys and monitoringaligned with PLO 1

CLO4 - Know the dominant plant species found in different forest communities and be able to recognize them at various age classes – aligned with PLO 5

 $CLO5-Be \ able \ to \ make \ vegetation \ maps-aligned \ with \ PLO \ 4$ 

Five student exam questions were used to assess the lecture portion of the course. The results indicated that CLOs 1, 2, 3, 4 and 6 either met nor exceeded expectations. For CLO 5, two of the students only partially met this expectation, two met the expectation and one student exceeded.

In the lab portion of this course, a field practicum was used to assess the CLOs with the results being similar to the lecture assessment. For CLOs 1, 2, 3, 4 and 6, assessment expectations were either met or exceeded. For CLO 5, one student partially met the assessment expectation, while four met the expectation and none exceeded.

To improve on teaching this course, more effort will be spent learning how to complete vegetation maps in both lecture and lab portions.

AG 245– Silviculture and Tropical Plant Propagation - assessed in the spring 2018 semester using the final exam was used as an artifact from the seven students in the class.

CLO 1 - Learn about seed collection and propagation of native and non-native trees – aligned with PLO 2.

CLO 2 - Understand the ecology and stand dynamics of native and non-native forest communities – aligned with PLO 2.

CLO 3 - Apply silvicultural techniques to native ecosystem restoration – aligned with PLO 6.

CLO 4 - Be able to identify important tropical tree species – aligned with PLO 5.

CLO 5 - Understand the operations of industrial plantation forestry – aligned with PLO 6.

CLO 6 - Demonstrate competence with tree mensuration and forest health assessment – aligned with PLO 5.

For all CLOs, none of the students failed to meet expectations. However, for each CLO, one or more students partially met expectations by answering between 60 - 70 % of the questions correctly. In the cases of CLOs 2 and 6, two students partially met and for CLO 5, three students partially met course expectations. In all of the CLOs, one or more students exceeded expectations, except for that of CLO 5, to understand industrial plantation operations where four met expectations.

Based on these results, more effort will be placed on emphasizing industrial forestry operations (CLO 5) and forest ecology and dynamics (CLO 2) and the calculations of tree growth (CLO 6).

AG 245L – Silviculture and Tropical Plant Propagation Lab - assessed in the spring 2018 semester based on lab report artifacts from the seven students in the lab.

CLO 1 - Demonstrate the ability to identify and propagate important silvicultural trees – aligned with PLOs 2 and 5.

- CLO 2 Apply Silvicultural techniques towards native forest restoration and plantation forestry aligned with PLOs 1 and 6
- CLO 3 Be able to measure and assess growth in trees aligned with PLO 5.

The results of the assessment show that for CLOs 2 and 3 all of the students either met or exceeded the expectations. However, for CLO 1, two students did not meet and one partially met the expectations. The artifact used to evaluate this CLO was based on tree identification and plant propagation assignments. To make sure that students meet this CLO, more time will be spent working with students to make sure that they can identify the trees and successfully propagate from seeds and cuttings.

AG 190v – Internship - assessed in the fall of 2019 semester based on internship presentations given by seven students.

CLO 1 - Apply knowledge learned in the Forest TEAM program to real forest ecosystem management or agroforestry operations with potential employers – aligned with PLO 1. CLO 2 - Demonstrate abilities to keep track of hours worked, skills gained, and tasks completed – aligned with PLO 6.

CLO 3 - Be able to communicate effectively with the public about various aspects of the internship position – aligned with PLO 4.

The results of this assessment showed that students either met or exceeded expectations for all of the CLOs. The breakdown for each CLO is the following: 1) four students met and three exceeded, 2) five met and two exceeded and 3) three met and four exceeded. This indicates that students are applying what they learn in class towards their internships, keeping track of their hours and tasks completed and effectively communicating their results.

AG 192 – Special Topics in Forest Ecosystem Management - assessed in the fall of 2019 semester based on the final exam test scores and field practical. There were four students in the course and the selected topic was the use of unmanned aerial vehicles (drones) in forest ecosystem management.

CLO 1 - Interpret and apply technical information to forest ecosystem management – aligned with PLO 6.

CLO 2 - Identify and evaluate conditions in the forest ecosystem – aligned with PLO 5.

CLO 3 - Demonstrate ability to apply selected topics towards forest ecosystem management – aligned with PLO 2.

The results of this assessment showed that all of the students either met or exceeded the expectation for all CLOs. The portions assigned to each CLO are the following: 1) two met and two exceeded, 2) three met and one exceeded and 3) two met and two exceeded.

d) Discuss changes that have been made as a result of the assessment results.

Overall, the assessment results were a positive indication that course instruction is effective and the students are demonstrating that they have met or exceeded most of the learning objectives. For the cases where these objectives were partially met or not met, these subject areas will be strengthened as mentioned in the assessment results discussion above.

## 4. Action Plan

During the next three academic years of 20/21, 21/22 and 22/23, the Forest TEAM Program will focus on addressing the issues of increasing program class size and improving student retention and successful completion of the program. As mentioned in the Program Analysis section, just before the pandemic hit our state, outreach activities over the last two years had started to take effect and a renewed interest in the Program was being realized. The Forest TEAM club had a membership of over 30 students and former graduates of the program were actively reviving the former Forest TEAM Juniors Club, which helps to generate new program recruits.

Due to lost momentum and with the difficulty of teaching field courses, it was decided that the Forestry Program would suspend offering courses until the fall 2021 semester. Those second-year students who need one or two courses to graduate will be allowed to take these courses as directed studies. In the meantime, efforts to recruit students will continue at virtual career fairs and new outreach materials will be developed. When it is safe for club activities to resume, the greenhouse will be made available for plant propagation and fundraisers.

The TEAM Program has secured USDA NIFA funding for AG education through August 2022 that has allocations to hire a student recruiter, which will be filled in the spring 2021 semester. A new USDA proposal will be submitted in early 2021 for continued USDA support until 2024.

In the fall of 2021, if field courses are possible, the TEAM Program will begin with offering the following semester courses in a two-year cycle:  $1^{st}$  - AG 175/L,  $2^{nd}$  GEOG 170/L,  $3^{rd}$  – GEOG 270/L, AG 190v, AG 192,  $4^{th}$  – AG 245/L, AG 275/L and AG 291. In addition, courses such as AG 175, 245 and 291 and GEOG 270 will be GE designated, so that Liberal Arts students can take them as electives. By employing these methods, it is hoped that classes will have at least 10 students each.

The TEAM Program plans to continue keeping track of graduate transfer and placement, to gage how well they are prepared for high education and career success. The Program also plans to continue working with the Program Advisory Council to help with program and curriculum modifications and with internship and graduate placement. In addition, the Program will continue to assess courses to improve their effectiveness.

In order to improve the Perkins CTE indicators, the Program will continue to recruit as many nontraditional participants as possible. The Program will also work to increase student retention by providing sound academic advice and maintaining quality and engaging instruction. Transfer will be improved by continuing to strengthen articulation with other campuses and making program modifications to aid in this process.

# Specify how the action plan aligns with the College's Mission and Strategic Plan: <u>HawCC Strategic Directions 2015-2021</u>.

The TEAM Program is aligned with the HawCC mission as we teach students about our natural environment and how best to manage resources. The Program also requires internship experience with potential employers to enhance workforce readiness. In addition, the program coordinates the USDA Alaska Native- Native Hawaiian Agricultural grant that brought in approximately \$330,000 to support agricultural projects for the TEAM, AG and HWST programs during this three-year period. Of those funds, approximately \$75,000 was paid to the College as indirect costs.

As for HawCC strategic plan, the TEAM program provides lifelong learning skills such as how to grow food in agroforestry systems, how to process and market these products and how to sustainably manage forest ecosystems

## Discuss how these recommendations for improvement or actions will guide your program or unit until the next Comprehensive Review.

The TEAM program action plan is primarily to increase recruitment into the program and to improve program efficiency so that there will be increased placement and transfer to other campuses.

AY 2021 Recruitment: TEAM faculty and staff will coordinate with area high schools to inform them about the program. A new student worker will be hired to specialize in outreach coordinating. New recruitment videos and presentations will be prepared in coordination with other AG programs in the UH system.

Program efficiency will be enhanced by making modifications that will allow TEAM courses to be available to other programs such as AG, HWST and Natural Science. It is hoped that by adopting the cohort model, course fill rates will improve.

\*The action plan may be amended based on new initiatives, updated data, or unforeseen external factors.

## 5. Resource Implications

*Detail any resource requests, including reallocation of existing resources (physical, human, financial)* 

The TEAM Program would like to request that the 16 student computers in room 104 in building 3393 be upgraded. In particular, the monitors need to be replaced as soon as possible.

Improved security is also requested, as during the last three years, two vehicles have been badly vandalized, the greenhouse has been broken into many times and equipment stolen. Simple security cameras in the area would help and possibly an alarm system.

□ I am NOT requesting additional resources for my program/unit.