



2021 Report to the Hawai'i Invasive Species Council



An 'ōhi'a blossom, a key component of O'ahu Watersheds, and one of the many native plants protected through OISC incipient invasive species survey and control.

The O‘ahu Invasive Species Committee (OISC) protects O‘ahu’s watersheds, ecosystems and agriculture by preventing harm from invasive species before those species become uncontrollable. The OISC field crew conducts surveys and control for invasive species that have not yet become abundant enough to damage the island’s agriculture and ecosystems, but likely would cause harm if not controlled. By removing invasive species before the effects are felt, we can prevent labor-intensive and costly remediation measures later.

OISC operations are guided by the OISC steering committee, which is made up of representatives of conservation organizations and land managers island-wide. Many of the people who serve on OISC’s steering committee today were giving up their weekends to control invasive species as volunteers when OISC was first formed back in 2001. For 2021 operations, HISC awarded OISC \$748,339 for surveys and control of priority invasive species and outreach. OISC raised an additional \$519,532 from other sources. The deliverables and accomplishments described below include HISC-funded activities and leveraged funds.

In 2021, OISC continued steady progress towards stopping the spread of incipient invasive species, including: miconia (*Miconia calvescens*), devil weed (*Chromolaena odorata*), cane ti (*Tibouchina herbacea*) Himalayan blackberry (*Rubus armeniacus*), and Cape ivy (*Delairea odorata*). OISC served as the co-lead for the multi-agency effort across O‘ahu to detect the two fungal pathogens that cause Rapid ‘Ōhi‘a Death (ROD). In partnering with the Māmalu Poepoe program, OISC facilitated early detection trap checks for coconut rhinoceros beetle (*Oryctes rhinoceros*) and Africanized honey bee (*Apis mellifera scutellata*) at Honolulu’s Daniel K. Inouye International Airport. OISC continued to provide guidance to partners and community members to help manage the spread of naio thrips (*Klambothrips myoporii*) and assisted the Hawai‘i Ant Lab (HAL) and the Hawai‘i Department of Agriculture (HDOA) with little fire ant (*Wasmannia auropunctata*) surveys and outreach. OISC is the primary outreach agency for little fire ant on O‘ahu and coordinates outreach efforts with the Hawai‘i Department of Agriculture (HDOA), the Hawai‘i Ant Lab (HAL) and the Coordinating Group for Alien Pest Species (CGAPS) in order to stay ahead of the invasion front. In addition to little fire ant outreach, OISC continued providing vital invasive species information to students, teachers, the landscape industry, recreational groups and other stakeholders throughout the island and state regarding watershed health and OISC target species.

In order to combat the threats posed by these target species, OISC deploys teams of field biologists with expertise in off-trail hiking, survey and control methodologies, helicopter safety, and species identification. Areas with historic species locations and the areas adjacent to historic locations as informed by OISC’s buffering system, are surveyed regularly until regional eradication is achieved. The eradication timeline varies by species and is determined by a number of environmental and biological factors specific to each target species. Typically, field staff will systematically scour survey sites along transects, by ground or air, and will control species immediately upon discovery. This system allows



Above: Miconia destroys the understory and promotes erosion, this photo is from Tahiti where miconia has taken over vast amounts of forest.

OISC to adapt our strategy to any species that the committee deems necessary for our organization to control.

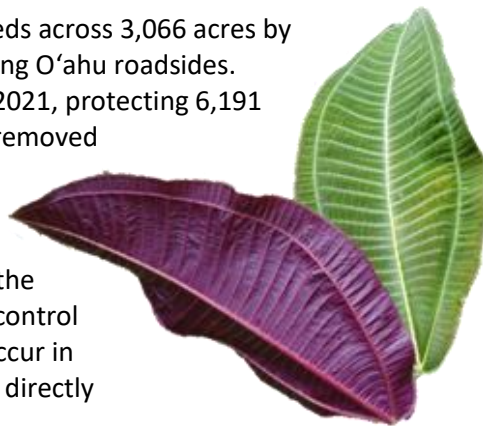
Miconia (*Miconia calvescens*)

Miconia is the highest-priority target for OISC because once established, it will severely degrade O'ahu's watersheds. Miconia's shallow root systems and leaf morphology promote excessive soil runoff during heavy rains by funnelling rainwater to the ground with tremendous force, thereby reducing soil retention. These characteristics indicate that a miconia-dominated forest is more prone to detrimental flooding impacts, including erosion and landslides, more so than a native-dominated forest. More landslides will mean more opportunities for weed invasion in our upper watersheds and the effects of increased landslides and flooding hazards will be felt throughout communities surrounding forests invaded by miconia.

Miconia incursion will not only harm our terrestrial ecosystems and surrounding communities, but this species will also damage our marine ecosystems. Increased stream sedimentation and stormwater runoff will deposit excessive nutrients and nonpoint source pollution into our nearshore waters, aiding the spread of invasive algae and decreasing prime habitat characteristics for native marine species. Characteristics like higher turbidity and lower dissolved oxygen from excess sedimentation and runoff will push native species out of these areas and invite non native species who thrive in these conditions to invade these areas.

Unfortunately, miconia seeds remain viable in the soil for at least 18 years, making this a project that requires long-term financial commitment. OISC's strategy is to survey the entire estimated seed bank of miconia every two to three years to find and remove trees before they mature. OISC utilizes a 1,600 meter buffering system around known plant locations. The inner 800 meter buffer is surveyed by ground, must be surveyed on a 3-year rotating schedule, and is the preferred method for detecting individual trees. Any areas deemed too steep to safely survey within the 800 meter ground buffer are surveyed by helicopter. The outer 800 meter buffer is surveyed once and then every 7 years when possible. This is the preferred method for detecting stands of miconia that have gone undetected in order to discover any outlier spread. These buffer distances have been informed by dispersal distance analysis and studies on biological vectors known to aid the spread of miconia.

In 2021, OISC conducted miconia surveys in 15 different watersheds across 3,066 acres by ground, 2,397 acres by air, and an additional 728 survey acres along O'ahu roadsides. Crews removed 1,640 immature and 14 mature miconia trees in 2021, protecting 6,191 acres of forest across the island. The mature miconia trees were removed from the Ka'ala'e'a, Kahalu'u, Kawainui, Mānoa, and Nu'uānu watersheds. Upon discovering a mature miconia tree on the outskirts of the miconia buffer in Maunawili, field crews detected and controlled a total of 8 mature miconia trees within the new 780-acre expansion of miconia survey area. The systematic control of miconia has prevented the type of single-species stands that occur in Tahiti where this species threatens two-thirds of the forest and is directly threatening 25% of native forest species with extinction.





Left: staff secure webbing to tall mature miconia to prepare for assisted fall during felling operation.



Right: staff climb through thick vegetation to access miconia patch.

The long-lived seedbank makes this species difficult to eradicate. Trees are sometimes missed because of thick vegetation and we have not been able to meet our goal of preventing maturation of trees in all watersheds. However, we have been able to prevent this species from establishing. When OISC first began surveys in 2002, we removed 40 mature and 3,347 immature trees from 2,042 acres. In 2021, OISC removed 14 mature trees over 6,191 acres, a drop in mature tree densities by over 80% since 2002.

Devil weed (*Chromolaena odorata*)

Chromolaena odorata is known as “devil weed” and for good reason. It is toxic to livestock and humans and a weed of conservation and agricultural concern throughout Africa and the Pacific. Populations of this species are currently known to occur at the Kahuku Training Area (KTA), ‘Ahupua‘a ‘O Kahana State Park, ‘Aiea Loop Trail, Camp Smith, and a multitude of locations between Malaekahana and Pūpūkea on O‘ahu’s north shore. Additionally, individual plants have been detected in Hau‘ula and Mākaha, but no reproducing populations have been discovered during follow-up surveys. A lone plant on the outskirts of Lanikai Beach was also detected several years ago, but subsequent surveys revealed no additional recruitment.

OISC field staff surveyed 98 acres of Mākaha valley trails and an additional 16.8 acres around historic devil weed locations during our initial camping operation, totaling 114 ground survey acres in 2021. Staff from partner agencies who work in this location more frequently have opportunistically found individual plants in the area, which has helped to direct OISC’s efforts to focus on trails in addition to historic locations within the valley. Although our surveys have not revealed large patches of devil weed in Mākaha valley, this plant’s ability to hitchhike on clothing and disperse itself has resulted in multiple detections by OISC partners. In 2021, OISC staff did not detect a single devil weed plant across the 114 acres of ground survey in this particular watershed.

In addition to devil weed survey and control operations in Mākaha, OISC conducts annual surveillance and control efforts in Kahana and at KTA. Field teams survey areas known to have recurring historic devil weed populations twice per year. Staff remove flowers and seed heads of any mature plants they encounter and any seedlings too small for adequate field disposal. All vegetative material that cannot be disposed of in the field is hiked out in sealed containers and incinerated at waste facilities to ensure this species is not spreading through the transportation of green waste. Locations with high population densities in these two areas are chemically treated using a truck mounted power-sprayer or precision helicopter spray with low concentrations of non-toxic herbicides. All other plants are hand-pulled and hung securely to dry out roots leading to plant death. Within KTA, OISC marks densely populated locations for follow-up treatment by the Army Natural Resources Program (ANRP), and within Kahana, OISC staff aerially treat high-density areas.



Some devil weed infestations on O‘ahu are now too large for OISC to be able to eradicate this species island-wide. Therefore, OISC has partnered with the Army Natural Resources Program (ANRP), the Department of Forestry and Wildlife (DOFAW), the Big Island Invasive Species Committee (BIISC) and the Hawai‘i Department of Agriculture (HDOA) to test a biocontrol agent for future release. This gall-forming fly, *Cecidochares connexa*, has been released within several other Pacific countries as a means to help control devil weed and has shown promising results. Currently, this biocontrol agent is undergoing host-specificity testing at the Pacific Basic Agricultural Research Center’s (PBARC) biocontrol facility in Hilo.

In combatting the spread of this tenacious species, OISC will continue to focus efforts on the edges of the infestation zones and move forward with supporting the biocontrol process. In total across O‘ahu, OISC controlled 154 mature plants and 10,518 immature across 1,536 survey acres in 2021.

Rapid ‘Ōhi‘a Death (*Ceratocystis huliohia* and *Ceratocystis lukuohia*):

Rapid ‘Ōhi‘a Death (ROD) is a forest disease caused by two species of fungal pathogen within the genus *Ceratocystis*. The pathogens have killed ‘Ōhi‘a trees across thousands of acres on Hawai‘i Island. So far,



only the less virulent of the two species (*C. huliohia*) has been detected on O‘ahu. Utilizing high-resolution aerial imagery and data collected during biannual reconnaissance helicopter flights, OISC and its partners collect wildland samples of the most symptomatic and safely accessible trees. A total of 8 trees since 2019 have tested positive for *C. huliohia*, and of the three positive detections in 2021, two came from the Nu‘uanu Trail near the Pauoa Flats junction and one

from a residence in a Kāneʻohe neighborhood. The Kāneʻohe detection was reported when a member of the public called OISC to report dead or dying ʻōhiʻa, highlighting the successful outreach efforts and the effect of the Department of Land and Natural Resources (DLNR) press releases.

In order to maintain a robust early detection and rapid response effort for ROD, OISC co-leads the Oʻahu ROD working group with staff from DOFAW, CGAPS, and ANRP. This working group implements strategies determined at the statewide level and addresses any island-specific considerations for response. Distributing sampling efforts between multiple partner agencies allows for a more complete effort across multiple land-ownerships to ensure that all safely accessible symptomatic trees are sampled. In 2021, OISC facilitated bimonthly meetings and will continue to co-lead this multi-agency partnership.

In 2021, OISC performed early detection surveys over 223,115 acres of Oʻahuʻs ʻōhiʻa forest by ground and air. Forest health surveys using the United States Forest Service Digital Mobile Sketch Mapping (DMSM) software allowed for two full island-wide surveys across 223,085 acres of ʻōhiʻa forest throughout the Koʻolau and Waiʻanae Ranges. Additionally, staff surveyed 70 acres of Oʻahu trails and treated 2 of the 3 positive *C. huihiohia* detections. The third positive detection, one of two along the Nuʻuanu trail, was treated by staff at DOFAW since the tree was located on State Forest Reserve land.

The work on Oʻahu is part of a statewide effort that is conducting early detection using the same methodology on all islands and is done in close cooperation with the Koʻolau Mountains Watershed Partnership (KMWP), DOFAW, and other partner agencies. In total, OISC collected 33 samples of symptomatic ʻōhiʻa, including 25 samples from 21 public reports of dead or dying ʻōhiʻa trees.

Cape Ivy (*Delairea odorata*)

Cape ivy invades dry forests on the Big Island and can smother native plants. The OISC crew has been monitoring and controlling a cape ivy infestation in Pālehua in the Waiʻanae Mountains since 2009. Through persistent treatment, the infestation has been drastically reduced from patches that were too numerous to count to only 8 individual immature plants and zero mature plants. In total, OISC surveyed 52 acres at known sites across the 100-acre region in 2021, removing 8 immature plants.

A table showing the decline in plants is shown below:

Year	Mature	Immature	Acres
2021	0	8	52.80
2020	0	27	85.65
2019	0	44	79.46
2018	0	150	78.85
2017	1	503	217.59
2016	1	1,365	291.36
2015	6	1,384	126.11

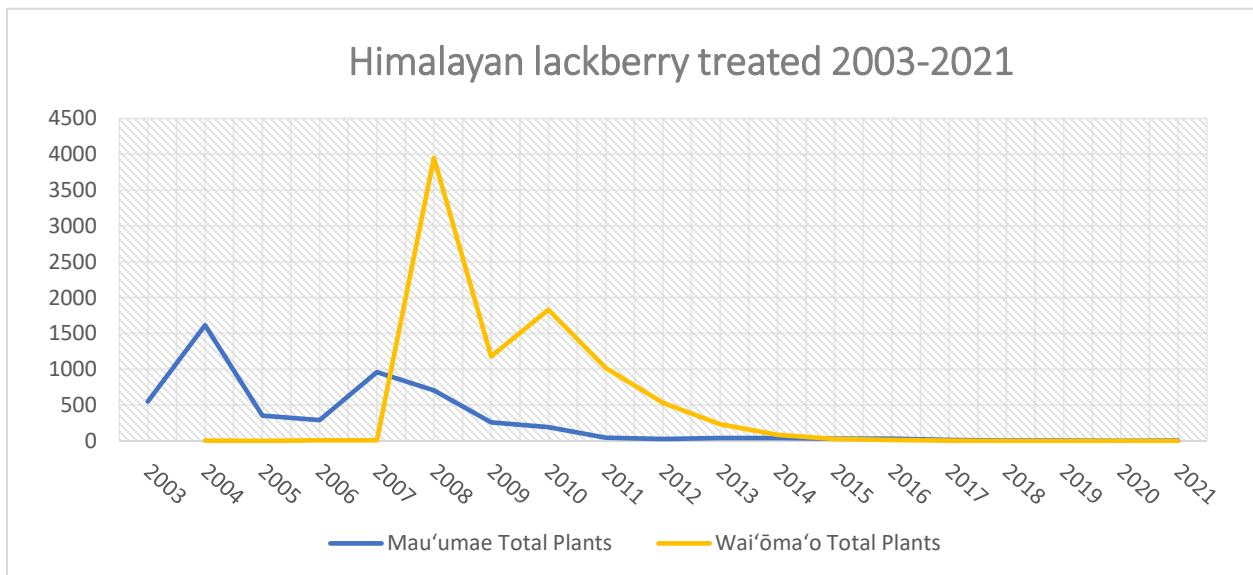
Himalayan blackberry (*Rubus discolor*; syn: *Rubus armeniacus*)

Himalayan blackberry is a thorny vine that is a serious problem in the Pacific Northwest. OISC staff have been told that it was planted on public land by a resident of Pālolo for fruits and to dissuade trespassers. It has since spread up the valley into the native 'ōhi'a forest, threatening the native species there.

Himalayan blackberry is difficult to control since it is resistant to available herbicides and re-grows easily from cut stems and roots. Despite these challenges, OISC has drastically reduced Himalayan blackberry numbers. Staggered chemical treatments reduced population numbers enough that OISC now focuses on manual removal for this species. OISC conducted 32 acres of ground surveys in 2021 at known accessible sites. OISC has reduced the number of Himalayan blackberry from 2,724 plants in 2008 to only 4 immature plants in 2021.

A table and graph demonstrating the decline in plant numbers is shown below:

Action Year	Mature	Immature	Acres	Total People Hours
2017	0	23	58.23	485
2018	0	5	29.28	248
2019	0	7	28.76	184
2020	0	4	33.11	240
2021	0	4	32.73	250



Cane Ti: (*Tibouchina herbacea*)

Cane ti threatens priority native watershed habitat in Poamoho, an area in the northern Koʻolau Range. ANRP staff discovered the highly invasive cane ti (*Tibouchina herbacea*) in the Poamoho region in 2008. This aggressive weed was not known to be naturalized on Oʻahu, but it is widespread on both Hawaiʻi island and Maui where it is beyond the scope of eradication. On these islands, cane ti forms dense thickets that crowd out native plant growth and can proliferate in pockets of intact native forest. In 2021, OISC surveyed 261 acres by ground and air, controlling a total of 12 mature and 392 immature plants within the Poamoho region.

Field staff conducted aerial helicopter surveys across 237 acres on the windward side of the Poamoho summit to delimit outlier populations and inform aerial treatment locations in areas inaccessible by ground. Utilizing the helicopter precision spot spray method, OISC treated these outlier populations in early 2022 and that data will be included in the FY22 report. Both aerial and ground operations are conducted in conjunction with the Natural Ecosystems Management & Protection (NEPM) sector of DOFAW, and staff from KMWP.



Field staff examining freshly pulled cane ti immature.

EARLY DETECTION & RAPID RESPONSE

Early-detection and rapid-response (EDRR) is a critical component for the biosecurity of our island and our state. Despite funding shortfalls in 2020 and 2021, OISC continues to fill a crucial role in EDRR activities for Oʻahu. Mostly through outreach until more funding becomes available, OISC fields public reports of target and high-priority pests and responds either with direct field intervention or delegation to partner agencies.

Africanized honey bee (*Apis mellifera scutellata*):

OISC conducts early detection surveys via trap checks for Africanized bees at Daniel K. Inouye International Airport in Honolulu as part of a collaborative statewide effort coordinated by the Māmalu Poepoe Program. Māmalu Poepoe is a partnership between the Hawaiʻi Department of Transportation (HDOT) and the Hawaiʻi Invasive Species Council (HISC) to conduct early detection of high-priority pests at Hawaiʻi airports. OISC conducted trap checks for this species once per month during what historically has been the low bee activity season (October – April) and twice per month when bee activity tends to increase (May – September). This strategy resulted in a total of 11



OISC staff checking swarm traps for bee activity.

traps checked a total of 20 times and OISC staff did not detect any Africanized honeybees in 2021.

Coconut Rhinoceros Beetle (*Oryctes rhinoceros*)

Coconut rhinoceros beetle (CRB) is currently limited to O‘ahu and a separate CRB response team is taking the lead for the response. OISC assists with tree surveys and trap checks at the Daniel K. Inouye International Airport in Honolulu to supplement the island-wide effort. CRB damage can kill coconut and other palms and is a widespread problem on neighboring Pacific Islands. In 2021, OISC conducted 13 trap checks and conducted 1 palm survey to check for beetle damage, confirming that CRB has not yet been detected at this international travel hub.



OISC staff holding Coconut Rhinoceros Beetle larva during staff training.

Little Fire Ant (LFA) (*Wasmannia auropunctata*)

LFA is a tiny stinging ant that is established on Hawai‘i Island and was accidentally introduced to O‘ahu in two separate locations. OISC has primarily focused on outreach for this species since 2019, but does assist HDOA and HAL with field survey and treatments on occasion. In 2021, OISC assisted in 15 surveys island-wide, mostly along the windward coast. The primary responding agency for LFA survey and control, the Hawaii Ant Lab (HAL), faced budget and capacity shortfalls in the face of increasing LFA populations. Until more funding can be secured for LFA survey and control, OISC outreach staff will continue assisting HAL as much as possible to stifle the spread of this injurious pest.

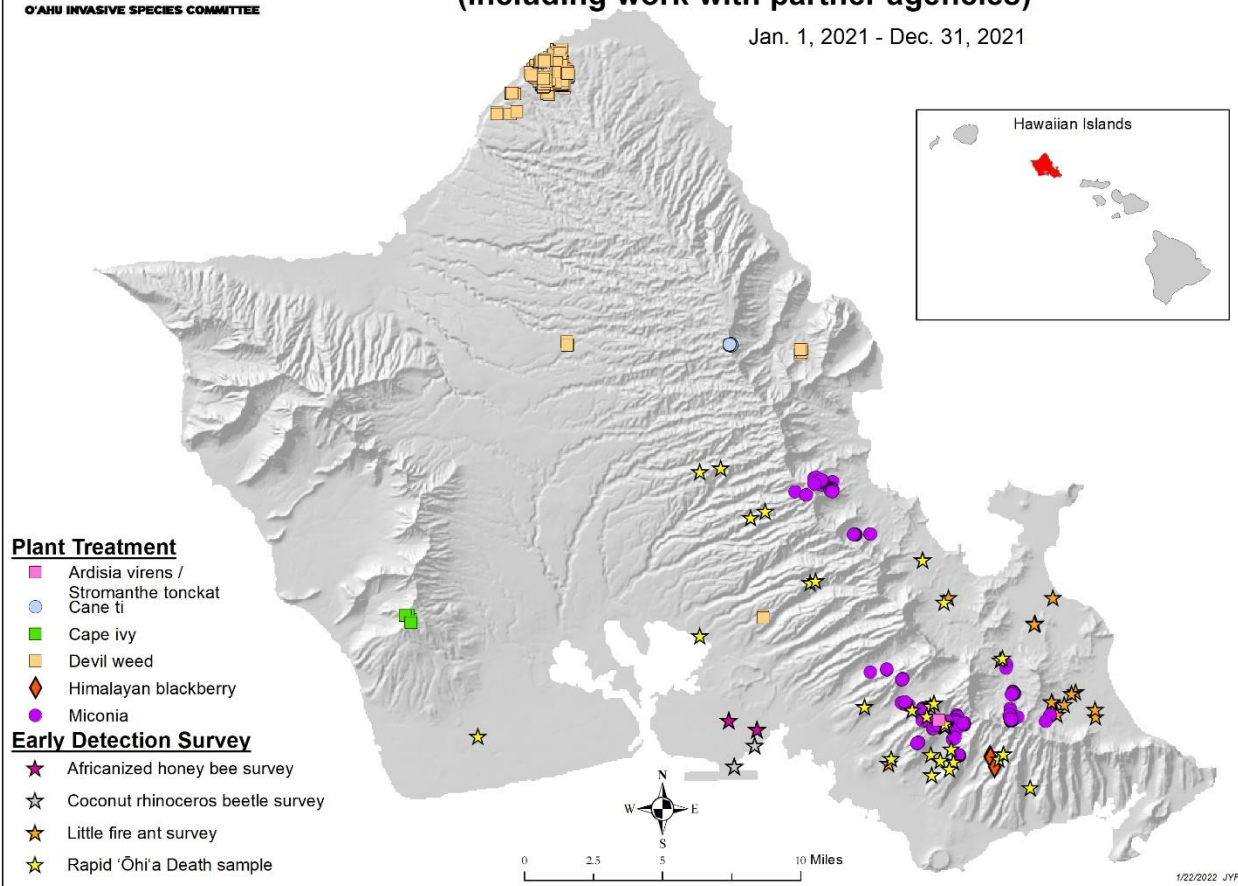
Coqui Frog (*Eleutherodactylus coqui*)

OISC provides monitoring support to the HDOA for early detection of coqui frogs by responding to public reports and passing on that information along to appropriate points of contact. Coqui frogs can be stowaways on plants and other items such as vehicles, boats and construction materials from areas on Hawai‘i Island with large coqui frog populations. Whenever possible, OISC assists with response to these public reports on O‘ahu through coordinated monitoring and subsequent control efforts with HDOA staff. In 2021, OISC was not awarded funding for coqui frog operations and was not asked to assist in any operations by HDOA or other partners. However, a wildland population was detected by HDOA staff in the Waimānalo forest. OISC consulted with HDOA, DLNR, and HISC to begin establishing a strategic response to the newly discovered infestation. Future effort for these species will be dependent upon funding and collaboration with state agencies.



O'ahu Invasive Species Committee Target Species Actions (including work with partner agencies)

Jan. 1, 2021 - Dec. 31, 2021



A spatial overview of all OISC field operations taking place across O'ahu.

OISC OUTREACH ANNUAL REPORT



OISC staff conducting outreach at one of the few in-person events in 2021.

OISC FY21 OUTREACH

OISC recognizes that outreach is integral to successful invasive species management. OISC needs public support so that we can gain access to the private property we need to survey so that our eradication efforts are truly island-wide. OISC target species can easily be transported anywhere on the island, so we need the public to be extra eyes and ears to watch and listen for any outlier populations. We also want to educate and inform the public on ways that they can aid our control and eradication efforts. For example, buying non-invasive plants and washing gear and equipment (especially boots) goes a long way towards preventing invasive species introductions.

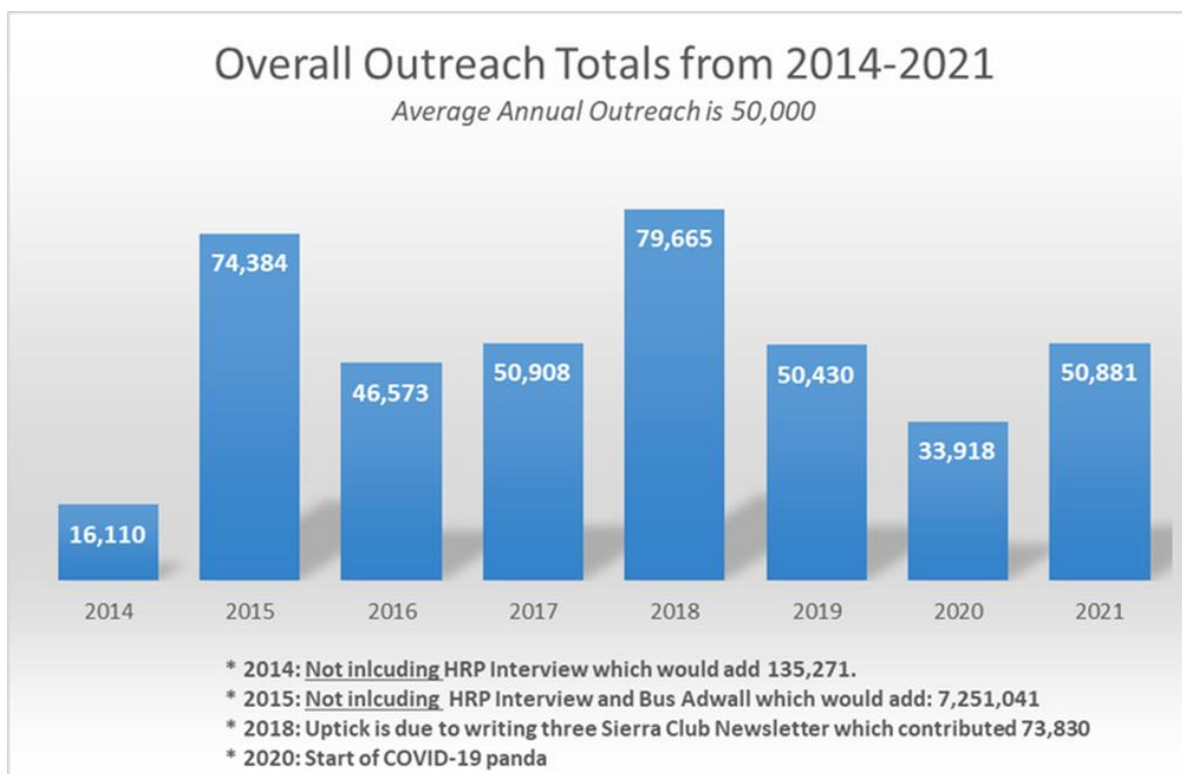
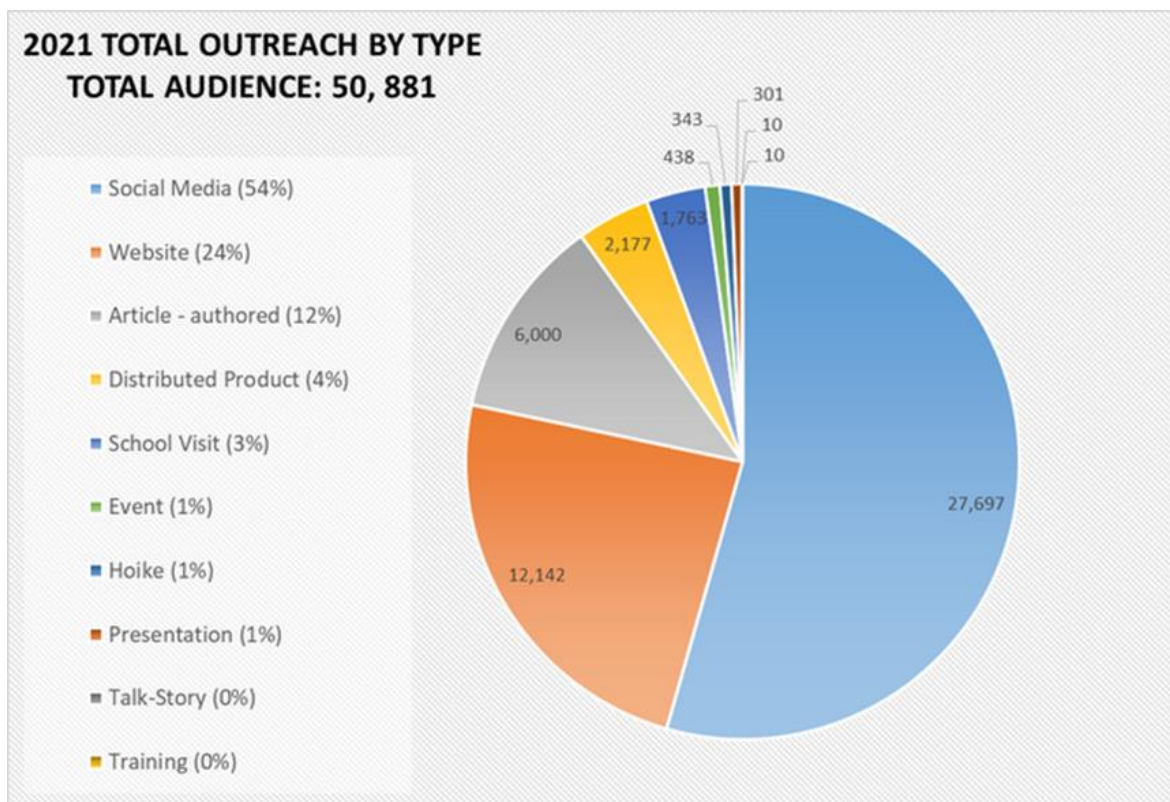
The OISC outreach program is dedicated to promoting our mission to prevent, detect and eradicate invasive species on O'ahu through presentations to area schools and communities, creating and distributing educational materials, conducting regular volunteer trips when allowable under COVID-19 guidelines (severely limited in 2021), and by working with partner organizations' outreach efforts. The total audience reached for OISC in 2021 was 50,881. This is an increase from 33,918 in 2020, demonstrating that our efforts are climbing back up to pre-pandemic levels even with the limited in-person outreach opportunities and volunteer outings.

The Outreach Program also works to secure access for the field crew to conduct surveys on private property. There are two members of the outreach team; Public Outreach Coordinator and the Outreach & Education Associate. While our Public Outreach Coordinator supervises all outreach activities and is primarily responsible for facilitating access permission and scheduling volunteer and tabling events, our Outreach & Education Associate manages OISC social media efforts across all platforms and focuses on school presentations and activities, including the Ho'ike program to educate students about Little Fire Ants.

Similar to our 2020-adapted efforts, the OISC outreach program operated differently in 2021 than in previous years due to the outbreak of the COVID-19 global pandemic. In 2020 most outreach activities were quickly and successfully converted online in the absence of in-person outreach due to governmental guidelines; however, some were not. In 2021 OISC outreach staff continued delivering presentations through web-based platforms like Zoom and Demio, created interactive webinars, published virtual outreach tools and worksheets to the OISC website, and expanded OISC's social media footprint. Although outreach staff were still unable to host volunteer outings in 2021, the creation of the Devil Weed Crew allowed for volunteers to operate more independently and report data back to our

Outreach Type	# of Type Events	Type Audience Total
Social Media (54%)	428 posts	27,697
Website (24%)	5 posts	12,142
Article - authored (12%)	1	6,000
Distributed Product (4%)	29	2,177
School Visit (3%)	19	1,763
Event (1%)	15	438
Hoike (1%)	8 schools	343
Presentation (1%)	16	301
Talk-Story (0%)	5	10
Training (0%)	2	10
TOTAL AUDIENCE		50,881

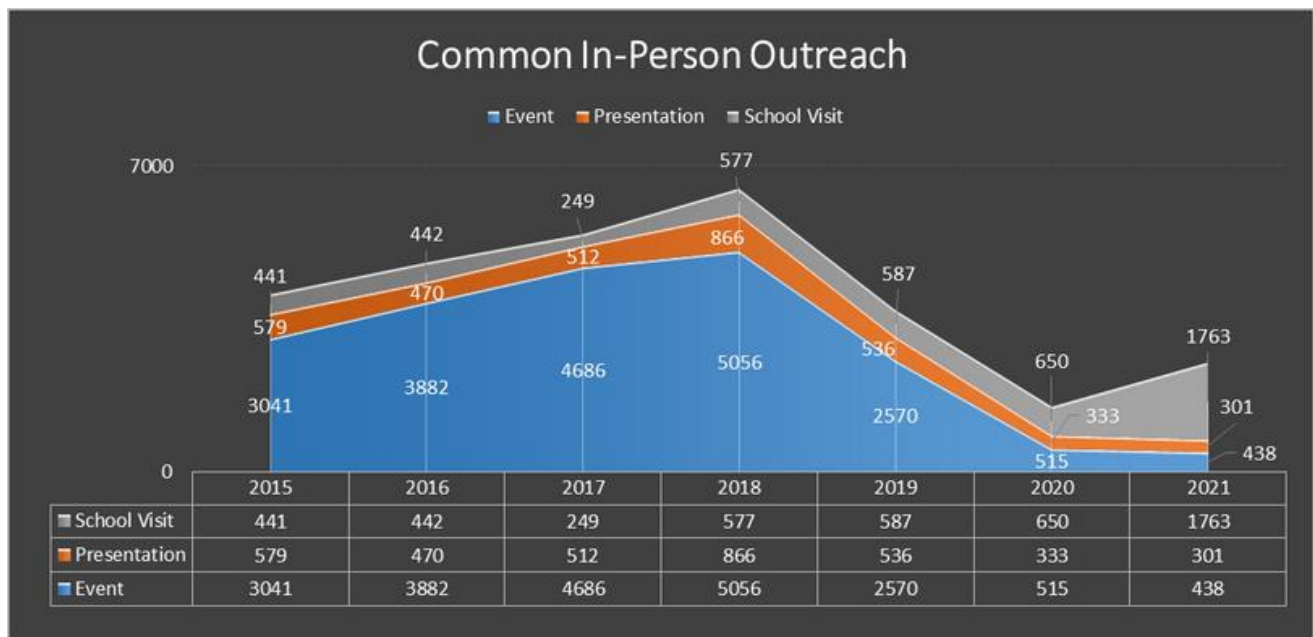
outreach staff for trail surveys.



Since our outreach efforts have shifted substantially since March of 2020, an annual comparison to pre-pandemic outreach provides some historical context to our outreach goals. On average, outreach totals approximately 50,000 annually. It is important to keep in mind that these are estimates and we have included caveats at the bottom of the graph that include significant unique events that have been excluded since they do not occur each year.

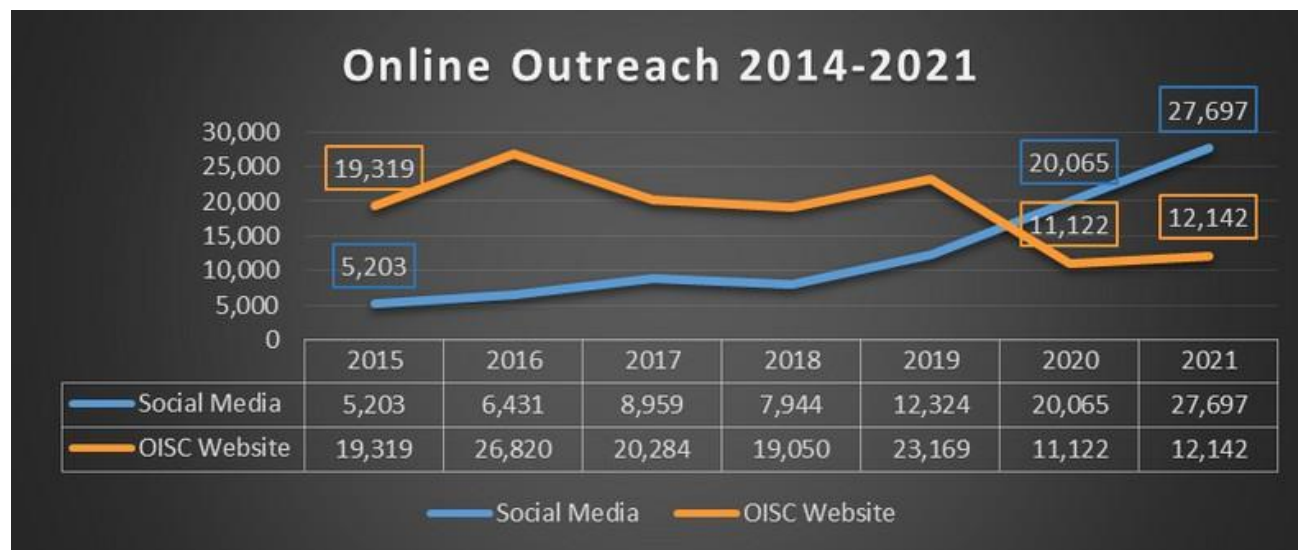
The most common outreach types for both promoting OISC strategic messaging and for fundraising are: events, community presentations, school visits, social media, website, and volunteer activities. The "bonus" outreach types are written articles, radio/tv interviews, print advertisements, and distributing outreach products. While the latter gets a wider audience and higher numbers, the outreach quality lends more to exposure of issues rather than comprehension of why it's an issue and the actions needed to mitigate those concerns. On most occasions, bonus outreach types, such as written articles and on-air interviews, coincide with specific events like an early detection of a target species in a new location or in conjunction with a more broad statewide or island-wide efforts that include efforts from multiple partner agencies.

Used in combination, these types of messaging can be quite effective in generating desirable outcomes, whether that be reporting, supporting state and municipal initiatives, garnering access for field operations or for important individual actions like decontamination practices. Comparing the types of outreach that OISC conducts each year allows us to identify trends and make improvements for future efforts.



The drop OISC messaging reach for in-person outreach began in 2019. Even though we attended 37 events in 2019, an increase from 30 events in 2018, the average attendance at these events decreased in 2019 from approximately 168 per event to 70 per event. The trend of smaller audiences carried over to presentations as well. Staff delivered 16 presentations in 2019, compared to the 14 in 2018, but the average audience in 2019 was 33, down from 57 in 2018. The slight downward trend in school visits is nominal with a difference of only 63 students.

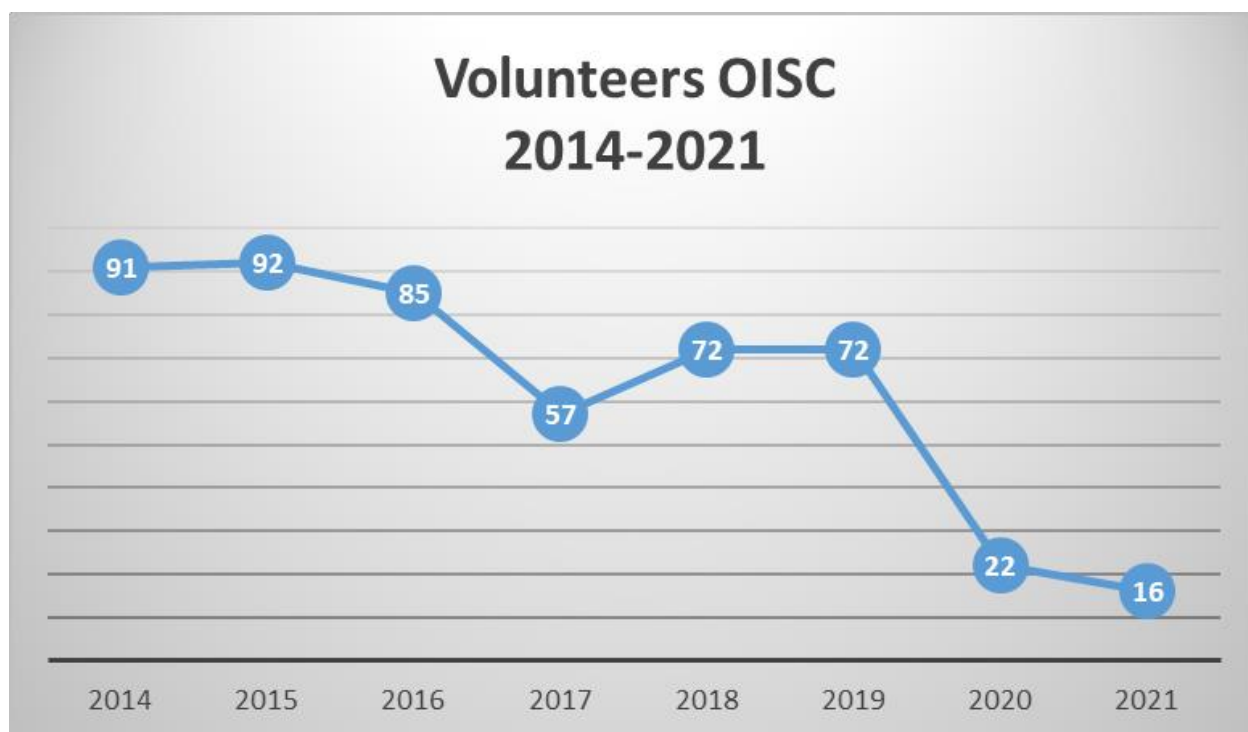
As OISC continues to analyze and make improvements in our outreach program, we believe that the return to in-person events after years of restrictions and the ability for staff to perpetuate the virtual outreach tools developed during the pandemic in conjunction with in-person events will result in increased reach for outreach messaging. The sharpest drop in all areas was due to COVID restrictions cancelling in-person activities, beginning in 2020. These restrictions continued into 2021 as declines in presentations and events as shown in the graph, however attendance for school visits began increasing as schools quickly incorporated virtual platforms into their curriculums.



The addition of the Outreach & Education Associate has allowed for an expanded focus on social media, which has been crucial as OISC outreach shifted to online and virtual messaging as a result of Covid-19. The drop in website traffic is likely due to its mobile accessibility and it's overdue for a formatting update to make the website more mobile-friendly. OISC will incorporate the lessons learned from the virtual outreach world over the last two years and integrate the most useful tools into our outreach strategy moving forward. As the community continues to move toward a more virtual and online presence in general, OISC will continue developing tools and messaging to stay ahead of the curve and keep up with public demand.

OISC volunteer opportunities have seen the largest reduction since the start of the Covid-19 pandemic and the subsequent restrictions limiting in-person outreach. Historically, OISC has hosted volunteer outings at Lyon Arboretum for two species, *Ardisia virens* and *Stromanthe tonckat*, as well as regular outings at the Pūpūkea-Paumalū State Recreation Area for devil weed. OISC suspended all volunteer activities in 2020 and this suspension continued throughout 2021 for OISC-hosted events.

In order to maintain our volunteer effort for devil weed, outreach staff launched the Devil Weed Crew citizen science project in February of 2021. This project allows volunteers to operate independently and on their own schedule to survey, control, and collect data regarding devil weed without the in-field guidance of our outreach staff. As devil weed continues to spread, OISC opened this project up to island-wide trail surveys in order to bolster our early-detection and rapid-response efforts for outlier populations of this species.



In 2020, all 22 volunteers participated in OISC outings prior to the establishment of pandemic restrictions. The Devil Weed Crew allowed OISC to maintain some level of volunteer support that had not occurred in almost a year. OISC staff facilitates this program through an active Facebook group that has grown to 54 members since its inception. In addition to the five YouTube tutorials posted, our outreach department created a field guide that we mail to interested volunteers in order to help them differentiate between similar species and remind volunteers of the data collection and survey procedures. Volunteers use the AllTrails free mobile application on their phones to record tracklogs, plant locations, and populations numbers. These figures are then collected by outreach staff and entered into our database. In 2021, volunteers surveyed 254 miles across 26 trails, removing 196 mature and 1,054 immature plants from O‘ahu watersheds.

Trails Surveyed	Volunteers (unique)	Hours	Miles	Mature Removed	Immature Removed	ID Guides Mailed
26	16	162	254	196	1,054	49

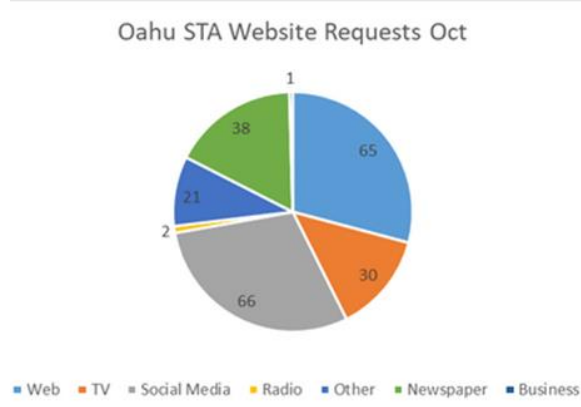
As the organizational lead for Little Fire Ant outreach on O‘ahu, OISC continues to participate in the island-wide working group, Hawai‘i Stop the Ant Month, and leads the Ho‘ike school activities. Outreach staff create and distribute testing kits across the island, help to identify ant samples, deliver presentations, inform legislators of LFA detections and response actions, and facilitate species identification with students and community groups. In the wake of reduced capacity for our partner

agency HAL, outreach staff also assist with surveying suspect sites and interagency treatment operations. In total OISC received 393 inquires pertaining to ants in 2021, and the 156 ant sample submissions resulted in two positive detections for Little Fire Ants.

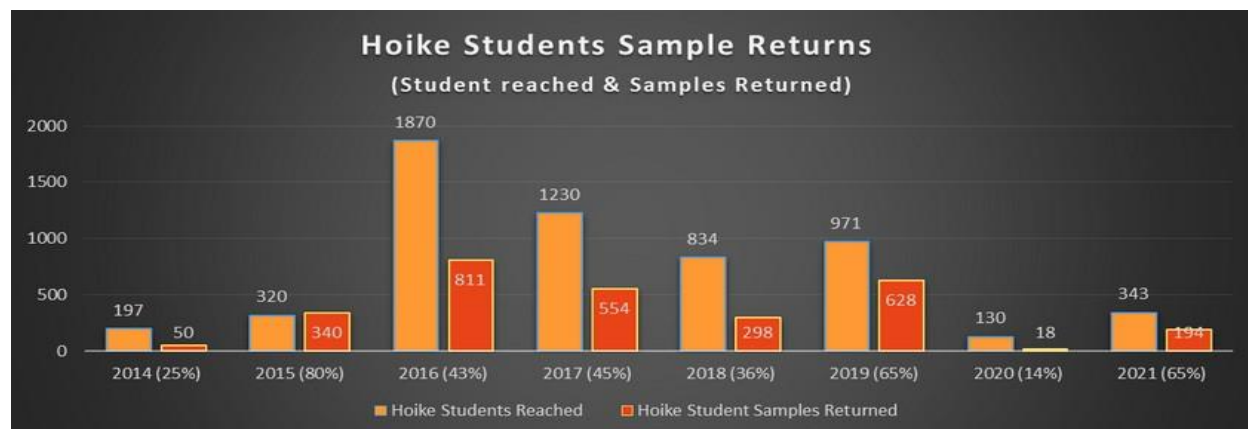
October is “Stop the Ant” month in Hawai‘i, and in 2021 OISC supported this statewide effort by advertising through social media and QR codes for free test kit requests in the Sunday edition of the Star Advertiser and MidWeek. Staff distributed 370 test kits to O‘ahu stores, including Home Depot, Ko‘olau Farmers, and Ace Hardware. OISC mailed decorative “Stop the Ant” tumblers as prizes to 20 random selectees who submitted ants for testing and sent letters to all legislators and councilmembers as part of the month-long campaign. In October, outreach staff reached 52 community members through two events at Sea Life Park’s “Spook Life Park” and Kapiolani Community College’s Virtual STEM Fest. Staff also conducted two school visits in October at Chaminade University and Kalaheo high school career fairs, reaching 77 O‘ahu students.

Compared to only 13 samples submitted as a result of Stop the Ant month in 2020, a total of 102 samples were submitted in October (76 samples) and November (26 samples) of 2021. Of these submissions, 56 requested a kit by mail and 84 used an already obtained or pre-made kit. OISC mailed a total of 351 testing kits on O‘ahu alone.

Oahu STA Website Requests		
How'd you hear?	Oct	Nov
Web	65	5
TV	30	10
Social Media	66	2
Radio	2	
Other	21	3
Newspaper	38	
Business	1	

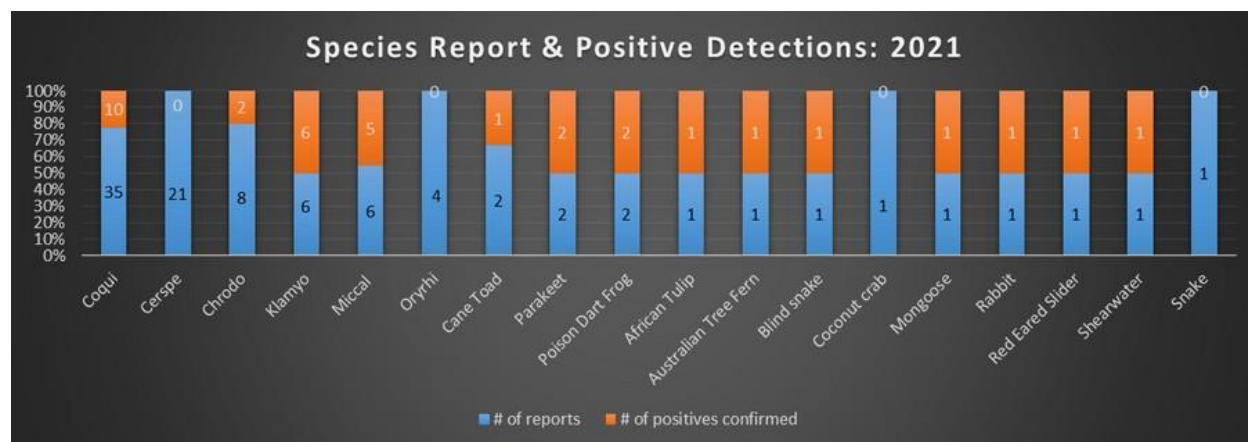
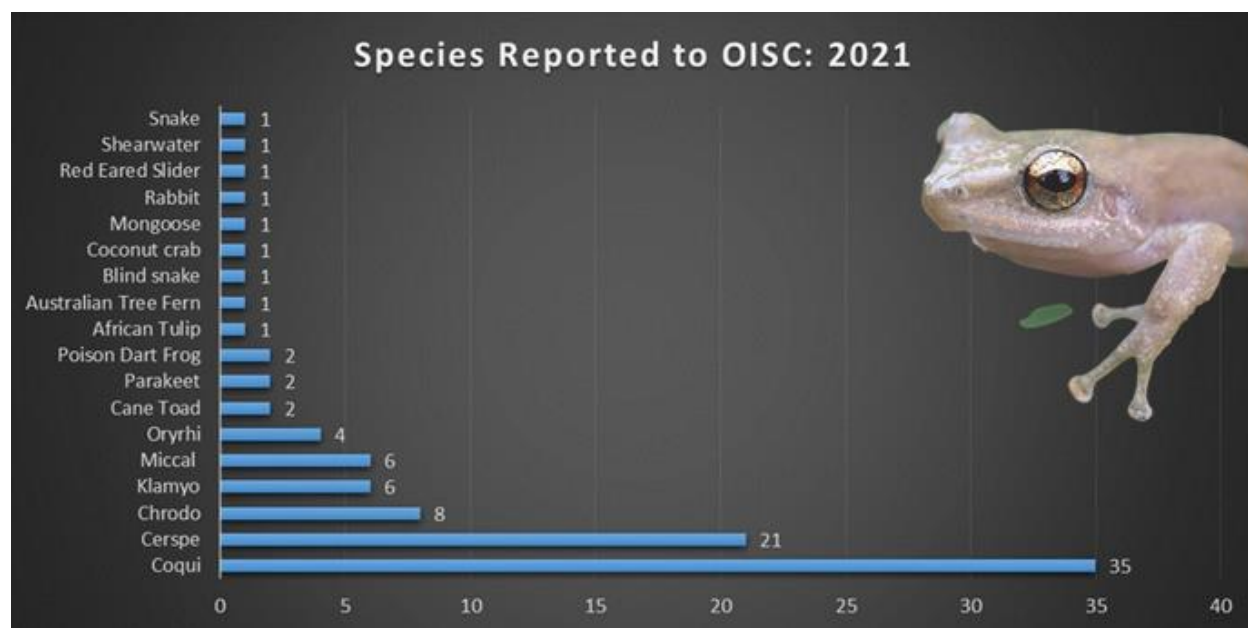


The Little Fire Ant Ho‘ike activity has yet to return to pre-pandemic levels, mostly due to the restriction of the in-class activity that accompanies the presentation. As restrictions loosen and schools return to in-person learning, we expect an increase in reach and engagement. In 2021, OISC presented the activity



to 8 schools across the island, reaching 343 students and garnering 194 student samples. This yielded a 65% return rate for student submitted ant samples.

The OISC Outreach program fills a crucial component in the island’s early-detection and rapid-response capacity. Staff regularly field calls, emails, and social media inquiries from the public about suspected OISC targets and other noteworthy invasive species. For species identified or not suspected to be OISC targets, OISC directs the reports HDOA for follow-up. Our outreach staff also continues to direct certain reporters to the 643-PEST phone number and 643Pest.org website for public pest reports when applicable. In 2021, OISC received a total of 79 public pest reports. The majority of these reports were for coqui frogs and suspected Rapid ‘Ōhi’a Death.



Similar to 2020, access permission requests in 2021 were lower than pre-pandemic levels. This is a direct result of the suspension of our miconia “Door-to-Door” operations. In order to comply with governmental and university restrictions, OISC put the surveying of small residential properties on-hold

to reduce the risk of Covid-19 spread between community members and OISC staff. Additionally, the increased search area resulting from a buffer expansion in the Maunawili region diverted our field crews to this location more than anticipated. In total, OISC requested access from 104 landowners via 334 emails, phone calls, letters, and text messages. Of these requests, only 4% of property owners denied OISC crews access to their lands.

Access Permissions 2021		
Yes	69	77%
Not Needed	11	
Pending	20	19%
No	4	4%
Total	104	

Social Media continues to be a critical tool for delivering important OISC messaging to the community. Our outreach team posts a variety of content across our social media channels to increase engagement and expand our audience, both in terms of diversity and amount. While social media has become invaluable for our outreach efforts due to the needed transition to virtual efforts as a result of the pandemic, we will continue to focus on social media even as in-person outreach continues to open. A more robust social media presences will continue to be a key component of OISC's robust outreach program moving into the future.

KEY PERFORMANCE INDICATORS		RESULTS
Total engagement (number of likes, comments, and shares of posts)		26,908
Total posts		428
Net new audience		809
Total audience		4,239

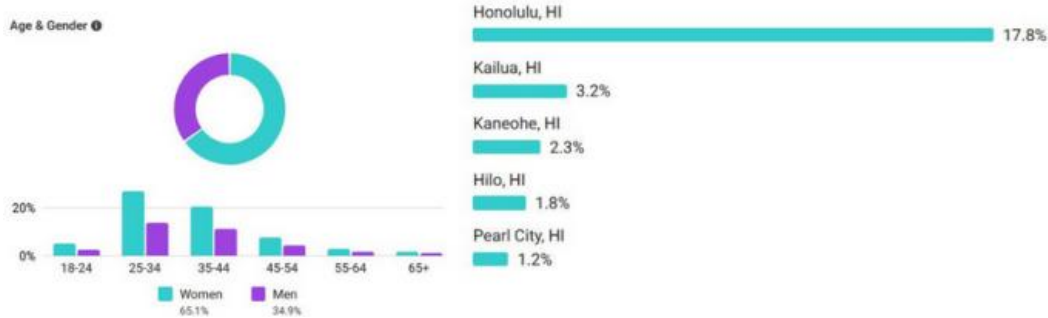
OISC relies mostly on Instagram and Facebook as the primary channels to deliver the majority of our content; however, in 2021 OISC continued to bolster our footprint on YouTube and created a TikTok account to engage the younger demographic. OISC also continues to use Twitter, albeit at a reduced capacity as compared to our other social media platforms. In total, OISC posted a total of 428 times across all platforms. OISC has a regular social media audience of over 4,000 individuals, but through Instagram and Facebook specifically, our messaging reached a total of 86,866 accounts.

Instagram continues to establish itself as our best platform to engage with the public online. OISC's fan base has grown steadily in 2021 for a net gain of 626 new followers. The goal for our outreach department is to reach 3,000 followers through a variety of posts. Posts with easily shareable graphics, staff photos, and target species identification through iSpy photos has led to four times more engagement than Facebook. Moving forward our staff will continue to establish our instagram presence through popular posts and collaborations with our partner agencies.

IG TOTALS	
Engagements:	20407
Posts:	173
Total Followers:	2540
DEC 2020 Followers:	1914
Net Gain:	626
Reach:	38298

Follower Stats

2.5K



Despite Instagram's prowess in terms of online engagement, Facebook allows our messaging to reach more people. OISC's Facebook audience tend to interact less with content than on Instagram, but the platform's ability to expand our network is a vital component to our social media strategy. In 2021, OISC reached over 48,000 Facebook accounts. For scale, that number is approximately equivalent to 5% of the population on O'ahu. While not all interactions are with O'ahu residents, it demonstrates how important this channel is for our

outreach efforts in terms of magnitude. Sharing posts with more information, like important finds for target species or staff changes and accolades, work well on Facebook. Any posts with more information to read or links tend to garner more engagement on this platform than others.

FB TOTALS	
Engagements:	6452
Posts:	197
Total Followers:	1787
DEC 2020 Followers:	1647
Net Gain:	140
Reach:	48568

Follower Stats

1.8K



For both YouTube and TikTok outreach staff will continue to post more frequently, study analytics, and grow our audience engagement and followers. OISC presentations will be more regularly added to YouTube along with an OISC Overview video and more species identification guides. Despite a low number of subscribers, OISC benefited from a 167% growth rate in 2021. This platform provides our organization with a repository for any video related content that can be easily accessed at will by community members. Outreach staff often share links to our YouTube videos and account via other

social media posts. In terms of TikTok, OISC will focus mainly on posting more and keeping content simple and straight-forward to grow the audience base.

