

Invasive Species Work in NPS Units in Hawaii and the Impacts from Covid-19

From NPS Parks Units on Invasive Species Work in the previous quarter, submitted for sharing at the CGAPS 10/01/20 general meeting by Jadelyn J. Moniz Nakamura, PhD, Research Coordinator/Science Advisor, National Park Service, Regions 8, 9, 10 and 12

Hawaii Volcanoes National Park (HAVO)

Key currently in progress projects:

- Invasive banana poka control in the Keauhou burn area
- Chemical treatment of fire promoting fountain and guinea grass
- Control of invasive faya tree in the Kilauea summit area and Kahuku
- Control of invasive weeds in Olaa rainforest unit
- Invasive LFA detection parkwide and control at Steam Vents site
- Rapid Ohia Death survey and management parkwide

All the above projects were executed, with significant mitigations to prevent the spread of COVID and ensure personal safety. For the Kahuku area faya and IPMT led invasive species work in Kona, camping protocols were developed with input from partners including BIISC and DOFAW.

Future funding for LFA work under FLREA may be reduced or eliminated, however COVID hiring flexibilities may enable the onboarding of new staff to assist with these efforts. The majority of ROD and Olaa rainforest work will be funded through partner USFS as originally planned and is progressing satisfactorily.

Operationally, the forecasted challenges to meet hygiene and social distance guidelines in day to day operations continue and require greater planning efforts. These include creative solutions such as staggered schedules, more time spent sanitizing, smaller group sizes, and adherence to vehicle and ridesharing SOPs or use of POVs for example. I continue to expect certain fund sources to be greatly reduced, e.g., FLREA.

Our operations have benefited from additional planning documents, such as the park's COVID guidance, which clearly outlines disease prevention measures and quarantine and isolation measures for suspected exposures.

Kalaupapa (KALA)

For KALA the situation has only become more dire with having expended project money on seasonal staff while on ADMIN leave. Also, one of my two pest-controller positions ordinarily integral to fence maintenance, animal control, and weed control has been vacant since October 2019, the PD awaiting classification. The other pest controller is currently unable to come to Kalaupapa on account of the park being under lock-down. I would ordinarily have a plant biotech that could help with fence checks, but that position is also vacant, leaving me (NR chief) to manage the nursery, keep water in wildlife troughs, and check fences on top of regular chiefly duties.

Haleakala (HALE)

The Vegetation Management program has 6.5 FTE completing invasive species and restoration projects. 4.0 FTE (collectively) of the staff are supported by project accounts. Currently, FY20, the project accounts supporting these positions are:

Project	Fund Source	Status
Pine Control	NRPP Region Block	Will execute the project fully as top priority when staff can return. Project was completed as Vegetation Management's top priority.
Nu'u Restoration	NRPP Region Block	Missed outplanting season and plot setup. Will modify project to attempt to meet deliverables.
Kaupo Gap Trail Restoration (and invasive species control)	FLREA	Reduction in EDRR (Early Detection Rapid Response), monitoring, and acres controlled.
Kuloa Point Trail Restoration (and invasive species control)	FLREA	Project will be completed as planned.
Restore Native Plant and Cultural Landscapes at Oheo (and invasive species control)	CFF (Concessions Franchise Fees)	Reduction in EDRR, monitoring, and acres controlled.
Invasive plant control Summit District	CFF	Reduction in EDRR, monitoring, and acres controlled.
Invasive Grasses in Kaupo Gap	Fuels	Will execute the project to control critical fuel loading. Project was completed.

At the beginning stages of the Pandemic, one Vegetation Management employee felt the need to leave his position and be with his family. This position was funded completely from project FLREA and CFF accounts. Due to the lack of income to the park, this position will not be backfilled. A second employee, supported by projects funds, has taken another position with USFS. Backfilling this position is in process. Onboarding of 3 park interns has also been delayed due to the reduction in shared housing.

All of these projects are considered "work in progress" in some regard, however the concern is that project funding is paying staff currently on administrative leave or telework only and will compromise the ability to complete projects adequately. The two soft funding sources of FLREA and CFF are where the majority of our funding is derived.

For Vegetation Management, some projects for FY21 and FY22 (from CFF and FLREA) are getting cut from funding because they were to support "new" positions, and therefore the project will not be funded.

ONPS Park Base funded operations: For what I see, the largest resource impact to Haleakala are the downed fences and ungulate incursions. The risk to numerous T&E species is very high and cannot be overstated. The park has fallen way behind on this. Below are a few invasive species projects that are worked on every year and are supported out of the Park Base budget.

Blackberry (<i>Rubus argutus</i>) Control	ONPS Park Base	Delayed, will execute parts of this project. Reduced acres of control.
Roadside and Trail Invasive Species Control	ONPS Park Base	Delayed, will execute parts of this project. Reduced acres of control.
Kipahulu Ginger (<i>Hedychium gardnerianum</i>)	ONPS Park Base	Delayed, will execute parts of this project. Reduced acres of control.

Additionally, due to the increased ungulate activity, Vegetation Management made plans to install smaller fence enclosures around high risk species populations. These areas require helicopter transport of crew and cargo and that is currently shut down. Due to reduced backcountry activities, one less employee, and prioritization based on safety and distancing, this project will undoubtedly be delayed and/or reduced. Maintenance on two other ungulate enclosures (protecting Endangered Species) has been delayed.

In general, the lack of staff on site - on park roads, trails, facilities, backcountry, etc – there will be a reduction in EDRR, monitoring, and acres controlled. In turn, we anticipate an increase in invasive species populations (seeding individuals) and vigor. It is unknown how proportional the increases will be to the reduction of effort.

Kaloko Honokohau (KAHO)

Currently, we have two Pest Controller Helpers beginning their second year of term appointments and two interns (KUPU and Geoscientists in the Park) working to assist our IPM Program and vegetation management in the park. This small crew of two plus interns is actively managing ~100 acres with the removal of invasive, destructive vegetation, with a focus on the stabilization of historic properties in various habitats including coastal strand, dryland forest, and Hawaiian Fishponds/wetlands. Hiring requests to have two more Pest Controller Helpers join the IPM program was submitted to HR in December 2019. But due to lengthy delays in hiring, the vacancy announcement to fill these positions has still not been released. In addition to hiring delays due to the COVID-19 pandemic, field crew were sent home from March 19 to May 26 (approximately 50 business days) causing impacts to progress on invasive weed removal and maintenance for on-going projects.

The COVID-19 pandemic also interrupted the park’s predator control program which normally includes daily trapping of small mammalian predators to help protect endangered endemic waterbirds. Unfortunately, the pandemic and lack of field crew working in the park coincided with the endangered waterbird nesting season this year. Although bird surveys and reproductive success monitoring was able to continue, predator control actions were halted, resulting in 37 trap days lost. The predator control program was able to resume starting May 26th.

COVID-19 has also affected park community workdays assisting in the removal and maintenance of invasive vegetation at ‘Aimakapā and Kaloko Fishponds. Following guidelines, small group workdays have recently resumed to assist with maintenance of restored areas at Kaloko Fishpond.

COVID-19 has affected three groups of USGS researchers who are working with KAHO and PUHO on developing methods to eradicate invasive fish (Tilapia and Poeciliids), and evaluate success using eDNA. Preliminary dye -tracing field tests at several anchialine pools occurred in December 2019,

however field trials of rotenone, the plant *Tephrosia purpurea*, and CO2 have been delayed due to travel restrictions.

Below is a list of our current RM projects (invasive species related):

Project	Fund Source	Status
'Aimakapā Fishpond Wetlands Restoration Project	FWS IAA	Period of performance extended to 9/30/21 due to the pandemic. Work currently ongoing.
Rehabilitate 'Aimakapā Fishpond South Shoreline and Establish East Access Trail for Interpretation.	Rec Fee 20%	All Rec Fee projects currently on hold. Work and deliverables planned to be completed in FY21.
LFA Eradication Project	ONPS In-kind	Ongoing since LFA first detected in July 2017. Minimal work lost due to pandemic, and project will go on as planned with Phase III treatments starting in October.
Clear Veg at Arch Site D12-4 and D12-6 in Honokōhau	CCM	Approximately 55 days of invasive veg removal lost. Contract awarded to assist with completion of project. Work now occurring and cyclic maintenance 2-year money will carry over to FY21.
Clear Veg at Arch Site D13-58 in Kaloko	CCM	Approximately 55 days of invasive veg removal lost. Contract awarded to assist with completion of project. Work now occurring and cyclic maintenance 2-year money will carry over to FY21.

Puukohola Heiau National Historic Site (PUHE)

The park has had on-going issues with feral goats in the park. We are starting to look at removal of feral goats (starting compliance process) and hope to do removal by testing techniques under CEs.

Main on-going NR/invasive species project is(being accomplished through CCM funding) is to restore the cultural landscape in the park. We should have two more years of funding.

IPMT (Invasive Plant Management Team)

IPMT Liaison completed 120-day detail as Chief of Resources Management at KEFJ on October 19th, 2020.

IPMT direct involvement and support of 6 interagency partnership helicopter precision spray invasive plant control missions on Maui, most notably those with LHWRP (Leeward Haleakala Watershed Restoration Partnership). One interagency pine mission with TNC-Hawaii. Multi-day missions are the

standard. Treatments targeted habitat modifying fire adapted invasive vegetation such as silk oak, Christmas berry and highly flammable molasses grass. ^{S,D}

Direct involvement and funding of personnel at precision spray invasive plant control missions at HAVO, primarily targeting fire adapted non-native fuels along the coastal plain and banana poka in the Keauhou Burn area (2018 wildfire). ^{S,D}

In collaboration with Vegetation Management program at HALE, completed multi-year initial knockdown phase of Monterey Pine invasion that resulted from the 2007 Polipoli Fire. In 2020, 384 targets were treated using precision aerial application techniques in 6 operational days. This represents the tail end of a decay function that is currently part of a paper that is under development. ^{S,D}

Completed fuels treatments using helicopter strip and precision application techniques at Kaupo and Nuu areas of East Maui, HALE. Primary targeted species included kikuyu grass, molasses grass, silk oak, and Christmas berry. Strip applications serve to begin re-establishing overgrown fuel breaks in the Kaupo area. Initial response will be the death of non-native fuels followed by gradual degradation of the fuels over the course of several months. Repeat treatments at intervals of 1-2x per year will be necessary once control is achieved. Spot applications serve to control more isolated individuals or clusters of both woody and grassy species. In total, 10,480 feet of fenceline in Kaupo were treated. Hundreds spot treatments were performed. ^{S,D}

Total area surveyed and inventoried in collaboration with HALE Veg Program over the course of FY20 via helicopter in Haleakala Crater and Kaupo/South Slope, 12,00 acres.

Coordinated and led 2 operational days in Haleakala Crater training and orienting new RM-Veg hires in November 2019. 3 operational days spent in Kaupo Gap ~3,300 feet elevation training and orienting new RM-Veg hires in February 2020. 1 strained knee (overuse) non-reportable injury discussed and mitigations implemented following Crater trip. 1 slip and fall incident (non-reportable, potential for injury) discussed with mitigations following the Kaupo trip.

Cleared invasive vegetation and hazardous trees in and adjacent to Haleakala NP Vegetation Management restoration exclosures in Oheo. This occurred over approximately 7 operational days using HALE NRM-Veg staff and HAVO Based IPMT staff. One near miss incident reported (Gooding – 1 cm nick to chainsaw chaps near It knee area in thick vegetation. No pulling of Kevlar safety fibers, but damage to nylon cloth overlay). Incident was discussed at length post mission and with followed-up in discussion with the national IPMT Liaison group. Can be used as a reminder that even when following proper procedures that should remove most risks, PPE has a critical function when conditions are not what they initially appear.

Consulted in dozens of requests for technical consultation and review, including: unanticipated herbicide damage inspections, project scoping and implementation recommendations, recommended herbicide treatments and methodology, timber inspections and scoping, remote sensing capabilities and possibilities, proposed project feasibility, and others. This is an essential IPMT function.

Involved in completion of environmental and cultural compliance documentation for removal of large stature invasive and hazardous pine trees at Haleakala National Park, including inputs and edits in PEPC. (Proved to be problematic later, but not an oversight by IPMT or HALE RM Veg)

Made progress in supporting and furthering Pacific Park compliance and capacity within the NPS NCSP Chainsaw non-fire use policy. Covid-19 resulted in delayed full implementation of the standards, so bridges needed to be implemented to span until full implementation may be achieved. Engaged in training and currency maintenance with park personnel. ⁵

Provided logistics support to facilitate 4 nine-day USGS mosquito research missions into Kipahulu Valley during the winter of 2019-2020.

Installed the first NPS GPS Base Station on Maui at HALE, making for real time differential correction and enhanced performance of GPS units for at least Maui and Molokai (KALA). This project included design, fabrication, installation, and initiation of the unit (Nov-Dec '19). Installation was used as a model for a second installation at HAVO later in 2020.

Facilitated data collection and GPS training workshop at KAHO that benefited PIN parks and partners. This involved coordination and partial funding to bring in experts from Oahu, Colorado, and AKR. Training attended by 1x HALE personnel funded by IPMT. Attendees from other PI parks also supported by Pac Islands IPMT.

Coordinated 20-year t-shirt design and artwork with Allie (Jan-Feb 20). The design turned out to be excellent but was not adopted by committee! This was an unfortunate and undesirable outcome.

Project scoping mission to the Kona Parks to develop 2020 operational work plan completed in January 2020. The first operational trip was cancelled, then rescheduled due to Covid-19 developments. A highly successful mission was executed in August 2020 that included mitigations for Covid-19 and expanded operational time to adjust for reduced staffing.

In association with R12 IT Program, installed Arrowhead WiFi units at Resources Management HALE. Other units (2) ready for install in facilities and to better serve housing (apartment units). IPMT funded acquisition of units and IT Manager Jim Barr led the installation. Thank you Jim!

IPMT/HALE Veg Management presentations on herbicide efficacy trials at the Maui Nui Weed Forum 2020.

Attended joint meetings of the Western Society of Weed Science and Weed Science Society of America in early March 2020.

IPMT Maintained all known currency and refresher schedules.

Initiated 4 new herbicide trials. Data collection to proceed FY2021.

1 paper is in development with Jon Marshall, Dr. James Leary, and Woody Mallinson. Anticipated submission for review is late Fall 2020.

Projects Delayed/Failed IPMT:

IPMT service to KALA due to Covid-19 (1-2 operational weeks, sensitive population & isolation)

All IPMT SAMO deployment / project cancelled and rescheduled for 2021 due to Covid-19 (12 operational days).

Missed initiating at least 8 desired herbicide trials relevant to KAHO, PUHO, and HALE due to Covid-19. Rescheduling planned for 2021.

Removal of mature invasive and hazardous pine trees in vicinity of Park housing and entrance station at HALE due to unforeseen complications during compliance development (not on IPMT responsibility list). This resulted in substantial loss of time invested in planning, logistics, implementation, and equipment acquisition by the Pac Islands IPMT. Time loss on the part of the Liaison exceeds 15 days. Additional losses included sunk costs of HAVO IPMT personnel and travel, although alternate plans were made to salvage 2 Op days relocating to Oheo. 4 weeks of planned IPMT field operations were lost due to the failure of this project to be implemented. This saved the program from other losses that would have occurred due to Covid-19.

Covid-19 considerations resulted in reduced/modified field operations capacity for the bulk of 2-3 months while adjustments were developed, implemented, and lessons learned.

Other IPMT projects were completed on a modified schedule with sometimes adapted parameters due to the Covid-19 developments.



^s No injuries, no near miss reporting

^p Data in processing. Due in to WASO November 2020