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DEPT. COMM. NO. 369

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DEPUTY TO THE CHAIRMAN

**STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS**

P. O. BOX 1879
HONOLULU, HAWAII 96805

January 20, 2021

The Honorable Ronald D. Kouchi,
President and Members of the Senate
31st State Legislature
State Capitol, Room 409
Honolulu, HI 96813

The Honorable Scott K. Saiki
Speaker and Members of the House of
Representatives
31st State Legislature
State Capitol, Room 431
Honolulu, HI 96813

Dear President Kouchi, Speaker Saiki, and Members of the Legislature:

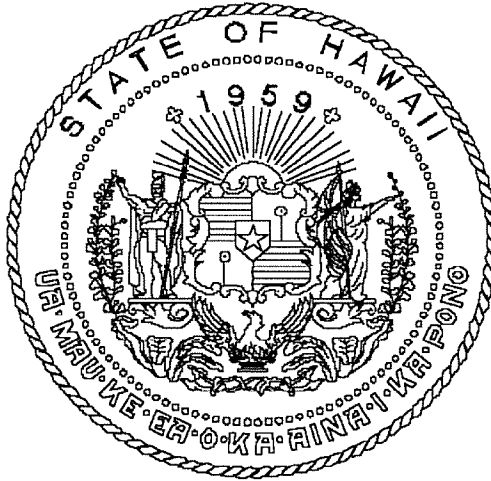
For your information and consideration, I am transmitting a copy of the Hawai'i Gorse Task Force Report to the 2021 Legislature as required by SR69, SD1 (2020). In accordance with Section 93-16, Hawaii Revised Statutes, I am also informing you that the report may be viewed electronically at <https://dhhl.hawaii.gov/reports/>.

Sincerely,

William J. Ailā, Jr., Chairman
Hawaiian Homes Commission

Report to the 31st Legislature 2021
Regular Session

HAWAI'I GORSE TASK FORCE



Prepared by the

State of Hawai'i Department of Hawaiian Home Lands

In response to Senate Resolution 69, Senate Draft 1

January 2021

GORSE TASK FORCE REPORT TO THE LEGISLATURE

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I. PURPOSE

The purpose of Senate Resolution 69, Senate Draft 1 of Hawai'i's 2020 Legislative Session (SR 69, SD1) was to request the Department of Hawaiian Home Lands to convene a task force to create a comprehensive mitigation plan with short and long term solutions to address the spread and eradication of gorse on Hawai'i island. Gorse is a very aggressive invasive species whose specific ecology and traits make it very difficult and costly to control. Coordination and sharing of knowledge and experience between agencies, landowners and communities, as well as long term support and funding are needed to control and effectively eradicate gorse from Hawai'i.

II. RESOLUTION REQUIREMENTS

SR 69, SD1 requests that the Department of Hawaiian Home Lands (DHHL) convene a Gorse Task Force (task force) to develop a comprehensive mitigation plan with short and long term solutions to address the spread and eradication of gorse on Hawai'i Island composed of the following members:

1. The Department of Land and Natural Resources (DLNR)
2. The Department of Agriculture (HDOA)
3. Hawai'i Invasive Species Council (HISC)
4. Other Interested Parties

The Task Force is also requested to:

1. Leverage all County, State and Federal agencies to address the problem
2. Explore potential commercial opportunities such as the use in biofuel, feedstock, and oils that would help address the issue.

III. TASK FORCE FORMATION

To address the growing issue of the invasive shrub Gorse in Hawai‘i, the Hawai‘i Gorse Task Force has been formed and is made up of representatives from the agencies identified in section II as well as representatives from The County of Hawai‘i (COH), University of Hawai‘i at Hilo (UH HILO), UH College of Tropical Agriculture and Human Resources (CTAHR) and the United States Fish and Wildlife Service (USFWS) and with recommended representatives by the United States Forest Service (USFS). DHHL was requested to convene the Task Force as the DHHL Aina Mauna Lands contain the largest infestation of gorse in Hawai‘i. DHHL reached out to each agency administrator through a letter of invitation requesting an appropriate representative knowledgeable in gorse from their agency to serve on the task force. After invitations were accepted and delegated, the Hawai‘i Gorse Task Force consisted of the following:

1. Joseph Kualii Camara, Property Development Agent, DHHL
2. Andrew Choy, Planning Administrator, DHHL
3. Lehua Kinilau-Cano, Legislative Analyst, DHHL
4. Robert Hauff, Forest Health Coordinator, DLNR, Division of Forestry and Wildlife (DOFAW),
5. Tom Dement, Natural Area Reserve Specialist DLNR, DOFAW
6. Springer Kaye, Manager, HISC, Big Island Invasive Species Council (BIISC)
7. Darcy Oishi, State Entomologist, HDOA
8. Kamran Fujimoto, Noxious weed species Specialist, HDOA
9. Yiqing Li, Professor of Forestry, UH Hilo
10. JB Friday, Extension Forester, CTAHR
11. Glenn Sako, Economic Development Specialist, COH, Department of Research and Development
12. Ryan Pea, Wildlife Biologist, USFWS
13. Eldridge Naboa, Wildlife Biologist, USFWS
14. Cheyenne Hiapo Perry, Coordinator, Mauna Kea Watershed Alliance (MKWA)

Task Force virtual meetings were held to share the expertise on management of gorse, develop potential short and long-term solutions for gorse, and discuss the long-term goal and strategy for gorse control and eradication in Hawai‘i. Task Force members were requested to attend meetings, complete surveys as needed, share potential partners, and evaluate and rank policy recommendations.

The following report outlines the Task Force’s finding and recommendations, including proposed legislation, and will be shared with The Hawaiian Homes Commission, Chairperson of the Board of Land and Natural Resources, Chairperson of the Board of Agriculture, Hawai‘i Invasive Species Council Program Supervisor, Hawai‘i State Legislature, and the Mayors of each county. This report includes:

1. A summary of the Gorse situation in Hawai‘i, past and current control methods
2. Summary of Meetings and discussions of the Hawai‘i Gorse Task Force
3. A list of high-ranked potential short and long-term solutions for gorse control in Hawai‘i
4. A summary of proposed legislation for gorse control in Hawai‘i
5. A list of additional recommendations for consideration

IV. GORSE SITUATION IN HAWAI'I

Gorse (*Ulex europaeus*) is a woody, leguminous shrub that is covered in spines that commonly grows to over 10 feet tall and can live up to 30 years. It is fast growing, and individual bushes grow together to form dense impenetrable thickets. Live plant material has a high flammable oil content and dead plant material hangs within plants, making gorse an extreme fire hazard to forests, agricultural land and even certain urban areas.

Gorse is a major problem in areas where it is considered invasive and causes significant production losses in agriculture and forestry worldwide. It invades rangeland, displacing forage species and physically excludes grazing animals from infested pastures. Gorse seedlings hinder plantation forestry by outgrowing and shading out tree seedlings. In native habitats it can shade out regenerating seedlings and change ecosystem processes. Gorse has outstanding ability to reinvade sites from which it has been cleared. This is directly related to a large and persistent seed bank. Its ability to colonize new sites is related to the large amount of seed produced and dispersed annually.

Gorse is native to Italy, Corsica, Spain, Portugal, France, Switzerland, Germany, Great Britain, Ireland, and The Netherlands. Gorse has naturalized in many temperate areas of the world and has become a serious alien invasive weed in New Zealand, Australia, USA, Canada, Chile, and several Indian Ocean Islands. It is New Zealand's most damaging weed, and it is defined as a weed of national significance in Australia. On the Continental US, gorse is regarded as a serious weed in Oregon, Washington State, northern California and British Columbia

Gorse was probably introduced to Hawai'i around 1900 and was considered an invasive weed by 1925. The shift from sheep- to cattle-grazing in high elevation grasslands on Hawai'i Island likely made the problem worse as cattle do not significantly graze gorse.

Gorse is a very difficult weed to control and manage due to a number of factors. Gorse matures early and can produce seeds before it is 2 years old. Gorse produces abundant and long-lived seeds creating a replenishing seed bank in which seeds can survive for over 30 years, necessitating long-term, consistent management and maintenance to control and ultimately eradicate gorse. Gorse efforts and resources for gorse removal are ineffective and wasted if long-term maintenance is not planned and implemented. Gorse seed can be transported to new areas by vehicles and in the fur and hooves of livestock and feral animals. Gorse thrives in full sun, poor soils and drought conditions, these conditions are present in many of the high elevation pasture and former pasture areas on Hawai'i Island and Maui.

Gorse occupies at least 10,000 acres of former pasture at an elevation of 5,000 to 8,000 ft in Humuula and Piipihonua on Mauna Kea on the Island of Hawai'i. The infestation is not effectively contained and could potentially spread around the island and become established between 3,300 – 8,000 ft elevations. Areas within this elevation range with suitable soils and conditions for gorse could include up to 500,000 acres on Hawai'i Island alone.

There is also at least 1,000 acres of gorse known along the slopes of Haleakala on Maui. The potential for spread on this island is also immense. Gorse is known historically from Molokai, but there are no plants present at this time. A risk assessment for gorse in Hawai'i can be found at:

http://www.hear.org/pier/wra/pacific/ulex_europaeus_htmlwra.htm

V. GORSE CONTROL EFFORTS

Since its introduction in around 1900, many efforts have been taken to try and control gorse in Hawai‘i. In Humuula, gorse was initially present only at Puu Oo. Its movement and establishment may have been aided by moving cattle and sheep herds, contaminated machinery and vehicles and attempts to control gorse with fire.

Starting in the 1920’s there were efforts to use biocontrol agents for the control of gorse. From 1985-2000, 7 biological control agents were introduced on Hawai‘i Island, of which 5 have become established. Initial effectiveness of certain agents were promising, although large fires and other factors including possible arrival of predators of agents reduced numbers and their impact. Studies from New Zealand have identified other potential agent(s) for introduction that could affect the health of gorse and reduce annual gorse seed production and deplete the seedbanks in Hawai‘i. Much of the research and groundwork for a potential agent has already been completed.

In 2001, large scale ranch leases ended on DHHL lands in Humuula and Piihonua and DHHL took over management of its Mauna Kea lands. By this time, gorse was well established and spreading. Efforts by ranchers to eliminate gorse using fire and herbicide prior to the expiration of ranch leases were not successful.

Since 2002, DHHL has worked to create buffers around the core population of gorse to contain it, and developed the Aina Mauna Legacy Program which outlined solutions for gorse control including large scale commercial forestry to shade gorse, and has spent significant resources to contain and control gorse on the Aina Mauna. The scale of the gorse infestation and finite resources of DHHL has resulted in a situation where gorse is present and spreading outside of the core containment area.

Efforts on Maui to shade and control gorse with slash and loblolly pines have proven effective on a small scale. Ranchers on Maui are currently managing gorse with an integrated approach and able to deal with the current level of infestation and maintain agricultural productivity. Smaller satellite populations on DHHL lands in Kahikinui are mapped and treated annually by Watershed Partners.

VI. GORSE TASK FORCE MEETINGS AND OUTCOMES

Task Force Meeting #1 Summary:

In the first Gorse Task Force Meeting, participants were asked to share their experiences with gorse and invasive species management. A brief history of gorse in Hawai‘i including its known extent, ecology, currently used best management practices, and challenges were shared to provide context of where gorse management in Hawai‘i is currently. Prior to the meeting, members were asked to have solutions and recommendations prepared for discussion. Discussions identified deficiencies and areas for improvement in Hawai‘i’s gorse control efforts and identified standard and novel approaches to expand on and or further investigate for implementation in Hawai‘i. Common short and long-term goals for the Task Force were discussed and included providing feasible effective solutions to gorse control moving forward, increase in public and stakeholder awareness, securing long term support and funding for control efforts, and working cooperatively on a comprehensive management plan. Solutions provided by Task Force Members were compiled for review and ranking.

Task Force Meeting #2 Summary:

The Second Gorse Task Force Meeting focused on reviewing and prioritizing the proposed solutions identified by task force members and stakeholders. Between meetings 1 and 2, task force members were asked to consider proposed solutions and to provide shared information resources to assist in prioritizing which solutions were the most feasible to pursue for the successful control of gorse in Hawai'i. Areas like New Zealand, Australia and Oregon have been dealing with large scale gorse infestations for decades and have organized agencies and stakeholders and created cooperative entities similar to the Hawai'i Gorse Task Force to coordinate efforts to control gorse. Valuable literature and information from other areas dealing with gorse were made available for review and included cooperative management plans, gorse control handbooks on best management practices and studies on potential uses of gorse. Resources available on the feasibility of potential gorse uses in Hawai'i and elsewhere are limited.

In meeting 2, each proposed solution was discussed and considered, and each Task Force member provided recommendations for the most feasible solutions to pursue. The top three short term and the top three long term solutions were identified for this report, as well as proposed legislation.

VII. TASK FORCE IDENTIFIED SOLUTIONS

The Hawai'i Gorse Task Force has prioritized and recommended 3 short-term solutions, to be implemented within the next 5 years, and 3 long term solutions for the control of gorse in Hawai'i. The recommendations are made in consideration of the most effective and efficient use of limited resources for the control of gorse in Hawai'i.

Short Term Gorse Solutions:

- 1. Establish Integrated Best Management Procedures for Gorse Control.** Gorse is a very difficult invasive shrub to control. An effective gorse control program requires a long-term commitment strategy and capacity and would include gorse removal, follow up treatments to control seedlings and resprouts for 5-25 years, effective seedbank depletion and establishing a land use that is resistant to gorse re-establishment. Best management procedures have been developed as a result of other cooperative efforts to control gorse in areas like Oregon and Australia. Integrated best management procedures can build off of knowledge from other areas as well as techniques developed in and for Hawai'i.
- 2. Identify, Map, Contain and Control Satellite Populations.** Once a gorse seedbank is established in a new area, it necessitates years of follow up monitoring and treatment to effectively eradicate. Identifying and killing gorse plants and patches before they are 2 years old is the most effective means of controlling gorse spread and most efficient use of resources. Reaching out to Landowners and stakeholders within gorse's potential range to educate and survey for gorse will be vital to stop the spread of gorse into new areas. New technology in UAV(drone), GIS and GPS technology should be used to map, monitor and document gorse control efforts. Funding and resources need to be secured, prioritized and made available to agencies and stakeholders for the immediate response and control of newly identified populations of gorse.
- 3. Implement Gorse grazing test plot using goats.** DHHL has a draft plan for a 30-acre test plot in Humuula for establishing gorse grazing protocols using goats. Goats have been proven effective

for control of gorse under specific conditions in New Zealand. A gorse grazing test plot would test different combinations of conditions to identify the prescribed grazing practices that are most effective and feasible for long term gorse control. Factors to be tested would be initial gorse clearing method, livestock density, grazing interval, forage and ground cover species, integration of sheep and other livestock and years of grazing needed for effective control. There are many concerns that need to be addressed before large scale goat grazing can be implemented, but if effective and feasible, goat grazing is an organic, scalable long-term maintenance tool that could reduce dependence on herbicides and mechanical control methods and provide income and or a food resource during the long-term gorse control process.

Long Term Gorse Solutions:

- 1. Identify and Involve Long Term Stakeholders.** Gorse, like many other invasive species, does not recognize land ownership boundaries. The potential range of gorse needs to be identified. Ranchers, landowners and agencies within this potential range need to be aware of the risk of gorse and encouraged to be proactively involved and educated in gorse issues. This will help to build understanding of gorse issues, create a network for early detection and control, and create a larger voice to advocate for actions and resources for the long-term control of gorse in Hawaii.
- 2. Secure Long-Term Funding for Gorse Control.** Gorse control is a long-term commitment. Clearing areas of gorse without follow up maintenance is a waste of limited funds. A common recommendation of gorse management plans is not to start a gorse control program unless long term planning and resources are in place to control gorse until the risk of reestablishment is gone. If we are serious about the threat of gorse in Hawaii and the loss of productivity of our high elevation lands, we need to commit to long term funding of control efforts.
- 3. Reintroduction of Livestock and Integrated Gorse Management.** DHHL lands in Humuula and Piihonua contain limited active livestock operations. Although livestock can contribute to gorse spread and proliferation if not managed in a way that considers and mitigates for gorse, livestock and associated pasture and ground cover management can be used as a tool for the long term maintenance and control of gorse toward the goal of seed bank depletion. Also, having an active presence on the land increases awareness of gorse locations, maintains access ways through pastures and livestock production can provide income for invasive species management. There are also numerous funding opportunities available for agricultural producers for responsible resource management.

VIII. PROPOSED LEGISLATION

- 1. Request Legislative Funding and Support for a Hawai'i Gorse Management Plan** There has not been a comprehensive gorse management plan for Hawai'i created thus far. There have been many efforts to control gorse in Hawai'i with varying success. A gorse management plan for Hawai'i would benefit all stakeholders by providing a template and resources for effective gorse control that builds on past experiences. A gorse management plan would be a means of implementing many of the proposed solutions in this report and create a document to provide information to stakeholders, partners and potential funding sources. Legislative funding and support of a comprehensive gorse management would be an appropriate use of public funds as it would support all stakeholders in Hawai'i affected by gorse.

IX. ADDITIONAL RECOMMENDATIONS

Additional recommendations identified by the Hawai'i Gorse Task Force, but not prioritized as the top 3 short or long-term solutions to pursue include:

Short Term Additional Recommendations:

- 1. Development of a Hawai'i Island and or Statewide Hawai'i Gorse Management Plan**
- 2. Establishment of Protocols for the Use of Prescribed Fire for Gorse Control**
- 3. Continued Feral Cattle Removal**

Long Term Additional Recommendations

- 1. Hire a Coordinator Level Gorse Management Position Devoted to Gorse Control**
- 2. Reforest Areas to Shade Out Gorse**
- 3. Introduction of Gorse Pod Moth and Other Possible Gorse Biocontrol Agents**