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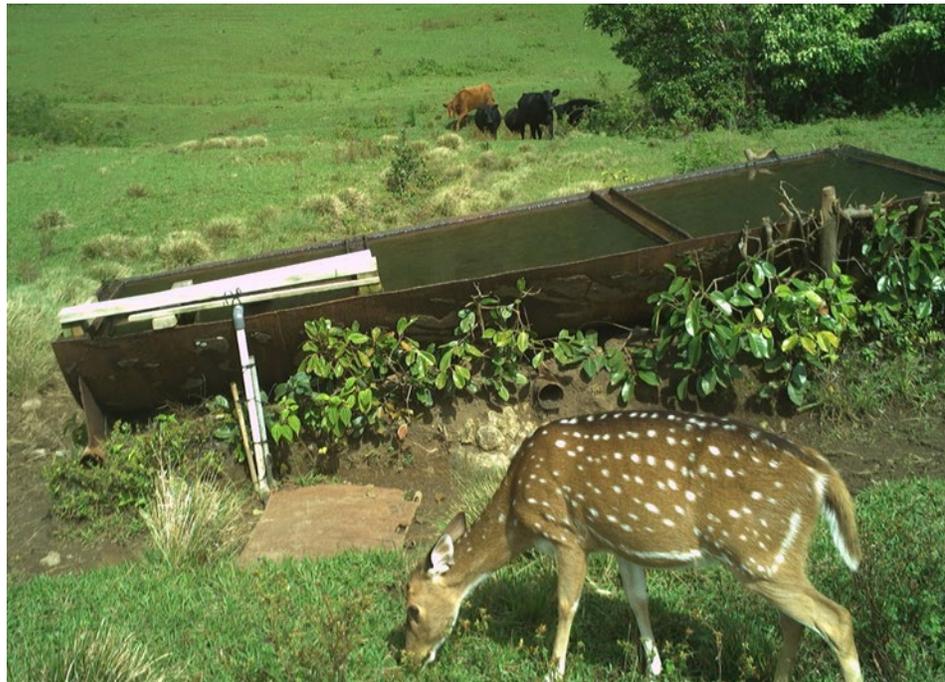
Strategy and Policy

Ruminant Health Center

June 2024

Review of Hawaii's Tuberculosis Eradication Program, 2024

A Review of Hawaii's Tuberculosis Management and Mitigation Activities



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2024 Review of Hawaii's Tuberculosis Eradication Program

Dates of the Review: June 25–27, 2024

Executive Summary

The Animal and Plant Health Inspection Service (APHIS) conducted a virtual review of the Hawaii bovine tuberculosis (TB) program the week of June 25–27, 2024. Review team members completed a preliminary review of program documents and database information provided by the Hawaii Department of Agriculture (HDOA), APHIS Wildlife Services (WS), and Veterinary Services Hawaii (VS HI) staff prior to virtual meetings. HDOA was very cooperative during the review process and showed an eagerness to collaborate with WS and VS to improve the Hawaii TB program. Personnel shortages and logistical challenges have limited their ability to fully implement all Memorandum of Understanding (MOU) responsibilities and the 2023 program review recommendations. The following 2024 TB program recommendations are explained in detail within the findings and recommendations section of this report. Critical recommendations are cornerstone activities that are necessary to achieve the goals of the program. Additional recommendations are activities that benefit the program and should be implemented to the greatest extent possible.

Critical Recommendations:

- Continue recruiting efforts to hire qualified local Moloka`i residents for the open HDOA Veterinary Medical Officer (VMO) and Livestock Inspector positions.
- Complete wildlife population estimates through the TB initiative game camera surveillance or other methods.
- Collaborate with VS to identify long-term funding source for wildlife TB surveillance testing at the National Veterinary Services Laboratories (NVSL) beginning FY2025.
- Develop a wildlife TB surveillance plan based on data collected from the TB initiative population surveillance project. This should include provisions for feral swine in addition to free-ranging cervids.
- Submit plan and timeline for implementation of Backyard Beef Herd (BBH) program requirements within 90 days of finalization of the 2024 TB review report.

Additional Recommendations:

- Complete transfer of historical herd testing data and epi investigations performed on affected herds into the HDOA Surveillance Collaboration Services (SCS) database.
- Collaborate with VS RHC epis to draft summary investigation report and load into SCS or Emergency Management Response System (EMRS) databases.
- Continue seeking SCS program support or VS SCS program support to facilitate herd reconciliation processes within the HDOA SCS database.
- Amend MOU Article 5, 3, (5) if unscheduled inspections are not occurring and replace with another mechanism to verify that non-permitted movements are being documented, tracked, and addressed.

- Add the following summaries in the annual TB report:
 - a. List of active wildlife mitigation strategies and their status.
 - b. Annual number and brief description of producer or public outreach meetings conducted throughout the year. Include number of “hits” on TB associated HDOA public facing websites.
 - c. Annual number of wildlife tissue sample submissions submitted to NVSL for TB testing. This should include both VS 10-4 field submissions and VS 6-35 slaughter inspection submissions.
 - d. Annual number of wildlife carcass inspections conducted under FSIS inspection by species.
 - e. Annual number of wildlife carcass inspections conducted by HDOA, VS or WS field staff by species.
- Request the most current, modernized Mobile Information Management System (MIMS) application software available through VS and request additional training for HDOA and USDA field personnel on MIMS and RFID tag retention issues.
- Continue to engage the USDA National Wildlife Research Center (NWRC) in TB studies to evaluate possible roles of various wildlife species in TB transmission on Moloka'i and increase efforts to evaluate mitigation strategies.
- Expand TB surveillance sampling to additional wildlife species as needed based on field camera surveillance findings.
- Develop a wildlife risk assessment tool for livestock operations on Moloka'i.
- Continue feed assistance support for livestock producers undergoing herd testing.
- Schedule meetings in FY 2025 between HDOA and VS to discuss the feasibility of a Moloka'i cattle production program and feeding facility to allow marketing of cattle off island.
- Continue VS work to validate the QuantiFERON-TB Gold® (QFT) Assay.

Background

On April 8, 2022, the HDOA placed a quarantine on the island of Moloka'i after detection of multiple TB positive livestock herds. A total of six TB-affected beef cattle herds were detected between July 2021 and March 2022, including a mixed herd that contained positive detections in both cattle and domestic swine. Two positive Axis deer have also been detected since April 2022.

Prior to the 2021-2022 outbreak, wildlife surveillance on Moloka'i was last conducted between 1997 and 2012 and again in 2018 with the last positive detections occurring in 2012. A Moloka'i TB Management Plan was developed in 2000 that defined wildlife surveillance and risk assessment parameters, movement restrictions for livestock, feral swine, and captive axis deer, and specific risk mitigations to reduce exposure between livestock and wildlife. Surveillance and risk assessments determined that feral swine in the eastern third of Moloka'i presented the highest risk of TB exposure to livestock. As a result of these findings, movement restrictions and testing requirements for livestock east of Kamalo remained in place until 2022 when these requirements were expanded to the whole island after detection of TB in livestock herds in

central and western Moloka`i. Wildlife surveillance continued through 2012, with primary focus on feral swine in eastern Moloka`i and was temporarily restarted in 2018.

HDOA and APHIS entered a TB Program MOU on November 23, 2022, to be renewed annually until such time APHIS determines that Moloka`i is free of TB. The current MOU was signed into effect on November 14, 2023.

APHIS/VS conducted a virtual TB program review for Hawaii in May 2023 to evaluate the progress of implementing the 2022 MOU. The scope of the review was limited accounting for the fact that the MOU had only been in effect at the time of the review and wildlife surveillance plans were still under development. Findings and recommendations were documented in an official report titled “Hawaii Tuberculosis Eradication Program Review May 2023” available on a public APHIS website ([Hawaii Tuberculosis Eradication Program Review \(usda.gov\)](https://www.usda.gov/hawaii-tuberculosis-eradication-program-review)).

The content of this report summarizes the June 2024 Hawaii TB Program Review. HDOA and VS HI have reviewed this report, and their feedback has been incorporated.

Review Objectives

The 2024 review format was intended to allow for a more collaborative approach across all participating agencies than previous TB program reviews. The review was conducted virtually June 25–27, 2024 and consisted of a combination of small group interviews, open forum discussions, and a strategic planning meeting.

The following review objectives were established and communicated with all participants prior to the review meetings:

1. Evaluate HDOA responses to the 2023 Hawaii TB program review recommendations.
2. Evaluate compliance with the articles of the current MOU signed into effect on November 14, 2023.
3. Evaluate the status of wildlife surveillance efforts and TB initiative project.
4. Establish short and long-term Moloka`i TB program goals.
5. Establish preliminary objectives for FY 2025 HI TB program review.

Findings and Recommendations

Findings and recommendations are categorized by Objective 1, Objective 2, Objective 3, and Other Findings and Recommendations. Any findings from Objective 1 and Objective 2 that pertain to wildlife are referenced and summarized in Objective 3. Review objectives 4 and 5 pertain to long term program planning and will not be summarized in the content of this report.

- I. Objective 1:** Evaluate HDOA responses to the 2023 Hawaii TB program review recommendations.

The 2023 Hawaii TB program review included seven recommendations for HDOA, all of which were complete or in-progress at the time of the 2024 review. Four new recommendations were made pertaining to this section.

1. *Increase HDOA staff positions on the island of Moloka`i to improve work efficiency and provide functional redundancy for the HDOA Livestock Inspector when not available.*
 - a. Some TB program activities on Moloka`i are still being hampered by personnel shortages and logistical challenges of inter-island travel. HDOA has open positions for a VMO and Livestock Inspector to be stationed locally on the island of Moloka`i. Both positions are actively being recruited but were not yet filled at the time of the review. HDOA prefers to hire local residents that already have existing relationships and trust with island residents. The State Animal Health Official (SAHO) noted there have been ongoing difficulties in recruiting open job positions across the State government but remained optimistic about filling the two Moloka`i positions.
 - b. Assessment: Response to recommendation still in progress.
 - c. Recommendation: Continue recruiting efforts to hire qualified local Moloka`i residents for the open VMO and Livestock inspector positions.
2. *Complete removal and postmortem examination of remaining five HI 22C exposed trace swine and submit all related indemnity documentation to HI VS by September 1, 2023.*
 - a. Indemnity processing, postmortem examination, and associated documentation had been completed for all trace swine at the time of the review.
 - b. Assessment: Response complete.
3. *Establish a Standard Operating Procedure (SOP) that prioritizes work activities for field personnel.*
 - a. *SOP 501-2023_ADC_bTB Activities on Moloka`i* was established on October 30, 2023, in response to this recommendation. The fundamental need for developing a work prioritization SOP was the shortage of field personnel to conduct TB program work on the island of Moloka`i. This issue still existed at the time of the review and is addressed in finding #1 of this section, but work activity is becoming more efficient. Field personnel stated the process for routine TB testing is better streamlined because the producers are now accustomed to it. HDOA has established good working relationships with the ranchers and procured additional handling equipment for use on the island. Scheduling is still onerous due to logistics, personnel, gathering the entire herd, need for more safe handling equipment, and poor existing cattle handling facilities.
 - b. Assessment: SOP recommendation complete. Full implementation is still in process.
4. *Work with VS and WS to develop a written SOP for wildlife surveillance testing.*

- a. Findings summarized in Objective 3.
5. *Complete migration of TB program data and management to SCS.*
 - a. HDOA program staff indicated that they have been using SCS on a regular basis and have migrated most data over. There are still hard copy documents that need to be moved to electronic format into SCS, but staff are entering all new data into SCS. Program staff noted that the SCS program support is sometimes delayed and difficult to obtain but have local VS resources that are proficient and can help as needed. They also noted that the SCS system is not very useful for herd reconciliation which is completed outside of SCS at this time. Duplicates of herds have been entered into SCS, and no investigation summaries were captured in SCS or EMRS for review. All herd investigations have been completed but there are no investigation summaries captured in SCS or EMRS for reference.
 - b. Assessment: Response to recommendation in progress but near completion.
 - c. Recommendation: Complete transfer of historical herd testing data and epi investigations performed on affected herds into the HDOA Surveillance Collaboration Services (SCS) database.
 - d. Recommendation: Collaborate with VS RHC epis to draft summary investigation report and load into SCS or Emergency Management Response System (EMRS) databases.
 6. *Consider developing electronic version of movement permits to improve efficiency and reduce work burden on staff.*
 - a. Program staff indicated that an electronic movement permit system has been partially developed but the protocol for processing electronic permits may render the system infeasible. If HDOA determines that an electronic permitting system is not viable or cost efficient to the program as they continue to assess feasibility, evaluating alternative solutions to improve permitting efficiency should be considered.
 - b. Assessment: Response incomplete.
 7. *Establish a BBH program SOP that incorporates the MOU requirements for official ID, annual inspections, herd reconciliations, and movement data.*
 - a. A BBH agreement form and SOP were developed and approved in October 2023, but HDOA staff indicate the program has not been fully implemented in the field due to staffing shortages and procedural issues. Enrollment of herds, official identification of animals, and herd inventory validation were not completed at the time of the review.
 - b. Assessment: Response incomplete.

II. Objective 2: Evaluate compliance with the articles of the current MOU signed into effect on November 14, 2023.

HDOA and APHIS/VS/FiOps are official signatories of APHIS Agreement No. 24-9715-D076-MU “Memorandum of Understanding (MOU) between the Hawaii Department of Agriculture (Cooperator) and the United States Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) Veterinary Services (VS).”

The MOU is comprised of 14 articles outlining the requirements and responsibilities for the administration of the Hawaii TB program. Article 5 defines 13 HDOA responsibilities and Article 6 defines 13 APHIS responsibilities. HDOA was fully compliant with nine of the responsibilities, partially compliant with three, and non-compliant with one. APHIS was fully compliant with all 13 responsibilities. The review team made a total of five recommendations pertaining to Articles 5 and 6.

1. Article 5 – Cooperator Responsibilities

- a. Article 5, E., 5. – *HDOA will utilize State authority to conduct unscheduled inspections of livestock shipments on public roads within Moloka`i for compliance with State requirements and this MOU.*
 - i. HDOA reported that no unscheduled inspection of livestock shipments on public road had been conducted since the 2023 review. The local livestock inspector maintains situational awareness of any livestock movements on the island through relationships with local producers on the island. HDOA noted that this activity is not prioritized due to personnel shortages.
 - ii. Assessment: Not compliant.
 - iii. Recommendation: If unscheduled inspections are not occurring, this action should be removed from the MOU and replaced with another mechanism to verify that non-permitted movements are being documented, tracked, and addressed.

- b. Article 5, H., 2. – *Conference of the Backyard Beef Herd (BBH) designation is approved by the Chairperson, Board of Agriculture. Backyard Beef Herds must:*
 - a.) *Be isolated to not contact other cattle,*
 - b.) *not be situated adjacent to other non-BBH cattle,*
 - c.) *not be in direct, nose-to-nose contact with non-BBH cattle at any time,*
 - d.) *undergo annual inventory inspection to verify the herd is comprised of six or fewer head,*
 - e.) *not be comprised of intact male and female cattle, breeding of cattle is prohibited,*
 - f.) *not allow cattle to be moved from the BBH to any other premises unless approved by HDOA, and*
 - g.) *animals within the BBH are identified as described in SOP No: 502-2023_ADC_bTB_BBH.*
 - h.) *HDOA must also be notified within 7 days if animals die, or prior to slaughter if not inspected by FSIS personnel (custom or home slaughter). Failure to comply with these requirements could result in the revocation of the BBH designation and could result in penalties.*

- i. SOP 502-2023_ADC_bTB BBH was established on October 30, 2023, to outline the BBH program process, but enrollment of herds, official identification of animals, and herd inventory validation were not completed at the time of the review. Recommendations for the BBH program were made in the 2023 review and are also summarized under finding 7 of the Objective 1 findings in the previous section. Personnel shortages, lack of equipment for safe cattle handling, logistical challenges, and lack of producer interest in BBH program enrollment were cited as reasons for non-compliance with this responsibility. Alternative solutions may be necessary to help bring the BBH program and associated traceability into compliance.
 - ii. Assessment: Partial compliance.
 - iii. Recommendation: Submit plan and timeline for implementation of BBH program requirements within 90 days of finalization of the 2024 TB review report.
 - c. Article 5, J., K., L. pertain to wildlife and findings will be summarized under Objective 3.
 - d. Article 5, M. – *HDOA will complete herd inventory reconciliation for Backyard Beef Herds and any whole herd test performed on Moloka`i by regulatory or accredited veterinarians within 60 days of a whole herd test or annual inspection. Herd inventory reconciliation means comparing herd inventories between two dates, identifying animals that cannot be accounted for by current databases, contacting owners to gather any additional information, and assigning animals for investigation. Justification for herd reconciliations extending beyond 60 days from WHT or annual inspection will be summarized in the annual TB reports.*
 - i. HDOA reported that they are performing herd reconciliations after whole herd tests but have not done so for BBH. Reconciliation within the SCS database has been problematic, so HDOA does so outside of SCS. This is discussed more under Objective 1, finding 5. BBH reconciliation was not possible because no herds had been fully enrolled with verified official identification at the time of the review.
 - ii. Assessment: Partial compliance.
 - iii. Recommendation: Continue seeking SCS program support or VS SCS program support to facilitate herd reconciliation processes within the HDOA SCS database.
- 2. Article 6 – USDA APHIS VS Responsibilities
 - a. Article 6, I. – *Provide support for acquisition and development of electronic identification, hardware and software in accordance with Animal Disease Traceability and USDA regulations.*
 - i. Hawaii VS has supported this responsibility as required by USDA Animal Disease Traceability (ADT) regulatory requirements. There is regular use of

RFID and MIMs for herd testing, but there is a major gap in ADT for BBH under the BBH program established in the 2023 MOU. Field staff mutually agreed that access to reliable, modern RFID technology is essential for efficient field work, especially when personnel resources are limited. The BBH program is primarily hampered by a shortage of personnel and handling equipment, but exploration of other ADT technology options should be considered to augment safety and ease of BBH monitoring and traceability. VS is currently developing MIMS technology through an Android-based platform and future improvements are planned to modernize the existing outdated MIMS PDA technology.

- ii. Assessment: Compliant.
- iii. Recommendation: Request the most current, modernized MIMS application software available through VS and request additional training for HDOA and USDA field personnel on MIMS and RFID tag retention issues.
- iv. Suggestion: Evaluate feasibility of RFID panel reader and necessary supporting infrastructure and support HDOA requests for additional ADT CA funds to purchase necessary equipment.
- v. Suggestion: Consider feasibility of using Ultra High Frequency (UHF) RFID tag and reading technology in herds where safe handling and working equipment is not available.

III. Objective 3: Evaluate the status of wildlife surveillance efforts and the TB initiative project.

The purpose of objective 3 was to evaluate compliance with Part V of the USDA Bovine Tuberculosis Eradication Uniform Methods and Rules (UM&R) pertaining to wildlife surveillance. The 2024 review had a broader scope than the 2023 review due to a longer period of time for implementation of MOU responsibilities and development of wildlife surveillance plans. The 2024 review team determined that HDOA, WS, and VS demonstrated excellent collaboration in addressing UM&R wildlife related provisions since the 2023 TB program review. Population studies are ongoing and wildlife surveillance sampling has become more efficient. A full wildlife surveillance plan cannot be developed until the population study is complete but significant progress has been made to date. Until sufficient wildlife surveillance is completed, it will be difficult to assess the risk to livestock, develop effective mitigation strategies, reduce quarantine restrictions, and eradicate TB from Molokai.

As provided in the Background section above, HDOA, and VS last conducted wildlife surveillance on Moloka'i between 1997 and 2012 and again in 2018. The last positive detections before 2022 occurred in 2012. They developed a Moloka'i TB Management Plan in 2000 that defined wildlife surveillance and risk assessment parameters, movement restrictions for livestock, feral swine, and captive axis deer, and specific risk mitigations to reduce exposure between livestock and wildlife. Surveillance and risk assessments determined that feral swine in the eastern third of Moloka'i presented the highest risk of

TB exposure to livestock. As a result of these findings, movement restrictions and testing requirements for livestock east of Kamalo remained in place until 2022 when these requirements were expanded to the whole island after detection of TB in livestock herds in central and western Moloka`i.

USDA Bovine Tuberculosis UM&R (2005), Part V, General provision 7 requires states or zones to implement a TB management plan that is jointly approved by the Chief State Animal Health Official and the APHIS Administrator if TB is diagnosed in wildlife and an APHIS risk assessment determines there is TB risk to livestock within the state or zone. The TB management plan must include provisions for:

- Immediate investigation of bovine TB in animals held for exhibition, livestock, and wildlife,
- The prevention of spread of the disease to other animals held for exhibition, livestock, and wildlife,
- Increased surveillance for TB in livestock, wildlife, and animals held for exhibition,
- Provisions to reduce the prevalence of TB in wildlife.
- A realistic timeline for the eradication of TB, and
- Surveillance of free-ranging cervids at a rate to determine the annual prevalence of TB in the cervid population within an area or zone that is not classified Accredited-free.

In addition to the TB management plan, feeding and baiting of free-ranging cervids should be banned in any county in which *Mycobacterium. bovis* infection has been disclosed in livestock or wildlife, and performance standards, as appropriate, must be implemented to measure yearly progress toward eradication.

HDOA incorporated TB management plan provisions into Article 5 of the current MOU, rather than a stand-alone management plan document. Findings in this section will only pertain to the wildlife related provisions of the TB management plan, MOU, and 2023 TB review recommendations as the livestock provisions are already discussed under Objective 1 and Objective 2. The review team recognizes that the Hawaii Wildlife Surveillance group, which is comprised of members from CEAH, FiOps, WS, and HDOA, was already in the process of addressing some of the recommendations in this report and may be completed by the time this report is publicized.

Findings summarized under each provision in the following list and related recommendations are directed to HDOA unless specified otherwise:

1. Immediate investigation of bovine TB in animals held for exhibition, livestock, and wildlife.
 - a. HDOA instituted opportunistic wildlife sampling in 2022 in response to livestock detections. HDOA began wildlife surveillance as quickly as could be reasonably be expected with existing resource availabilities and has consistently shown progressive improvement in surveillance responses since sampling started.

- b. Assessment: HDOA is compliant with this provision and has demonstrated consistent, timely investigations since the first MOU was signed in 2022.
2. Prevention of spread of the disease to other animals held for exhibition, livestock, and wildlife.
 - a. Appropriate quarantine and response measures were taken with the TB affected herds in 2021-2022 to reduce risk of spread to other livestock but there are currently minimal mitigations in place to reduce exposure to wildlife. Much of the existing fencing on the island is in a degraded condition and generally insufficient to affect wildlife exposure to livestock.
 - b. HDOA quarantine order no. 158 restricts movements of live ungulates, including wildlife, to and from Moloka`i and between premises on the island. All movements must be approved and permitted, and all captive Axis deer must be test negative within 30 days of movement unless direct to slaughter.
 - c. MOU Article 5, J. states *HDOA will collaborate with APHIS Wildlife Services (APHIS WS) and APHIS VS, university and agency-based researchers, and representatives of livestock producers to increase the biosecurity of herds in the highest risk on Moloka`i. This effort is designed to identify and support long-term cattle raising practices that may decrease risk of bTB infecting herds from surrounding wildlife.* During the review, it was not clear if any direct collaboration for this purpose had occurred specific to developing biosecurity practices, but HDOA expressed a desire to develop and provide wildlife risk mitigation tools for livestock producers on Moloka`i. HDOA has conducted multiple meetings with producers and residents on the island to discuss TB response activities and works with VS and WS on a regular basis to implement wildlife TB surveillance activities. A suggestion was made to consider development of a wildlife risk assessment tool for Moloka`i livestock properties based on the Michigan Wildlife Risk Assessment (WRA) program, adapting it to Moloka`i specific data and factors. Though the WRA tool may result in recommended mitigations that incur significant costs to HDOA and the producer, the WRA tool itself may be of reasonable cost to develop as there is an existing template potentially available to use.
 - d. MOU Article 5, L. states *HDOA will evaluate effectiveness of deer exclusion fencing and other wildlife mitigation strategies in cooperation with VS and WS partners through the funded 2023 TB Initiative Project, proposal for a 2024 TB Initiative Project or other available funding.* The initial TB initiative proposal submitted for consideration in 2022 included a request to study fencing mitigation strategies but was not funded as part of the overall project. This project is still a valid concept worthy of future study if funding becomes available. Fencing and physical infrastructure sufficient to reduce risk of wildlife exposure is very expensive, particularly on Moloka`i. It is a financial burden that is likely impossible for most livestock producers to afford or accept. It is also unlikely that

HDOA can support high-cost physical infrastructure mitigations with existing resources.

- e. Assessment: The language of this provision to “prevent spread of disease” is intentionally broad to account for management of variables that may differ by geographic region where TB is detected. HDOA is compliant with this provision and MOU responsibility, but efforts to evaluate additional mitigation strategies need to continue. An exclusion fencing project was proposed but it was not implemented in 2023 due to lack of funding support. Quarantine measures are in place to restrict live animal movement, including captive axis deer, and should remain until the risk of transmission on the island is demonstrated to be negligible by surveillance data. HDOA has conducted public outreach meetings and has an active website with TB program information, but it would be helpful to have updated summaries on these activities for future reviews. Wildlife specific mitigation strategies will be better informed with additional surveillance information that is discussed in more detail in findings and recommendations for Provision 5.
 - f. Recommendation: Consider developing a wildlife risk assessment tool for livestock operations on Moloka`i.
3. Increased surveillance for TB in livestock, wildlife, and animals held for exhibition.
- a. HDOA, WS, and VS have acknowledged the need to re-institute wildlife TB surveillance since positive livestock herds were detected in 2021 and HDOA began opportunistic sampling of hunter harvested axis deer and other wildlife in 2022. Efforts intensified in the spring of 2022 after the first ever detection of TB in an axis deer in western Moloka`i. A cumulative total of 113 wildlife surveillance samples were submitted to NVSL for testing as of the 2024 review. Samples were obtained from one Blackbuck antelope, one feral swine, and the remainder were from Axis deer. A total of two positive wildlife samples have been detected through this surveillance, both of which were from Axis deer harvested in western Moloka`i in the spring of 2022 and 2023.
 - b. 2023 TB program review recommendation #4: HDOA should *Work with VS and WS to develop a written SOP for wildlife surveillance testing.* Interviews conducted during the 2023 found that surveillance sampling was not very efficient due to limited personnel resources on Moloka`i and a need for clarification on the sampling protocols. *Moloka`i Wildlife bTB surveillance Standard Operation Procedure* was developed in direct response to the 2023 recommendations to help improve quality and quantity of samples submitted for testing. The review team found the 17-page SOP to be an excellent resource that exceeded expectations of the 2023 review team. Additionally, WS hired additional field personnel stationed on Moloka`i to assist with multiple wildlife surveillance activities including but not limited to wildlife sample collection and submission, field camera installation and management, and outreach activities

with local hunting groups. Open HDOA personnel positions on Moloka`i will also support these surveillance activities once filled.

- c. Starting in FY 2025, VS funds for laboratory testing of surveillance samples will no longer be available in the same manner they had been previously. VS advised HDOA to request additional funding for this purpose in their FY2025 annual umbrella cooperative agreement.
 - d. Assessment: HDOA has clearly increased wildlife surveillance efforts since 2022 and continue to improve efficiency of field surveillance sampling. This will further be aided with incoming data from the ongoing population camera surveillance project and filling open HDOA staff positions on the island.
 - e. Recommendation: HDOA will work with VS HI to identify long-term funding source for wildlife TB surveillance testing at NVSL beginning FY2025.
 - f. Recommendation: Expand TB surveillance sampling to additional wildlife species as needed based on field camera surveillance findings.
4. Surveillance of free-ranging cervids at a rate to determine the annual prevalence of TB in the cervid population within an area or zone that is not classified Accredited-free.
- a. This provision is addressed in MOU Article 5, K. states that *HDOA will collaborate with Hawai`i Department of Land and Natural Resources (DLNR) and USDA WS as necessary for the accurate determination of the prevalence of bTB in wildlife species on Moloka`i and evaluate the need for wildlife control activities on livestock premises to reduce bTB transmission risk.*
HDOA field staff began submitting wildlife TB surveillance samples for testing at the NVSL in 2022, but it is not possible to estimate prevalence or determine a statistically significant number of samples for surveillance without accurate population estimates. It is widely accepted by local residents, HDOA, WS and VS that there is an overpopulation of axis deer on Moloka`i but actual population numbers are unknown as no accurate population studies have been completed in recent years. In 2022, HDOA partnered with WS and VS Centers for Epidemiology and Animal Health (CEAH) to submit a VS TB Initiative project proposal to estimate axis deer populations on Moloka`i and assess movement patterns of wildlife on the island. The project was approved but did not start data collection until November 2023.
 - b. Assessment: HDOA is compliant with this provision and MOU responsibility to the extent possible with current surveillance data. Annual prevalence rate of TB in wildlife cannot yet be determined, but HDOA is conducting active surveillance while population estimates are being conducted. While a collaborator in the TB initiative project, HDOA doesn't control when the camera surveillance project will be finished. HDOA should continue to support, where possible, every effort to get it completed in a timely manner.

- c. Recommendation: Develop a wildlife TB surveillance plan based on data collected from the TB initiative population surveillance project. This should include provisions for feral swine in addition to free-ranging cervids.
5. Provisions to reduce the prevalence of TB in wildlife.
- a. Provisions to reduce prevalence are not possible until there is a better understanding of the impact of both wildlife and human population dynamics, hunting and livestock ranching practices, and climate factors on the risk of TB spreading between wildlife and livestock. Additionally, we do not fully understand the nature of the two recent detections in Axis deer in 2022 and 2023. Whole Genomic Sequencing determined that the Axis deer detections were related to an ancestral TB strain from historical Moloka'i detections and closely related to the livestock detections in 2021-2022 but the directionality of that spread from wildlife to livestock or vice versa is unclear. It is also unclear if the Axis deer detections were part of a unique spillover event or if there is ongoing transmission occurring in the wildlife population to maintain a long-term reservoir of disease that could be a risk of transmission to livestock. The ongoing camera surveillance population study and wildlife surveillance sampling will help to answer some of these questions, but it may take a period of several years to accumulate the data to do so.
 During the review, experts from the USDA National Wildlife Research Center discussed the possibility using computer modeling to help determine potential wildlife mitigation strategies and if eradication in wildlife is possible. With only two confirmed wildlife detections since 2022, it would be premature to propose any mitigation strategies that would directly affect the wildlife population without further research. However, the review team agreed that computer modeling could be a valuable tool to guide future strategies.
 - b. Assessment: Provisions to reduce prevalence of TB in wildlife are not possible until further research and surveillance data are completed.
 - c. Recommendation: Continue to engage the USDA National Wildlife Research Center (NWRC) in TB studies to evaluate possible roles of various wildlife species in TB transmission on Moloka'i and increase efforts to evaluate mitigation strategies.
6. Provide a realistic timeline for the eradication of TB.
- a. Based on the information shared in the previous findings, it is not possible to estimate a realistic timeline for eradication of TB on Moloka'i or if it is even attainable at this time.
7. Recommend banning feeding and baiting of free-ranging cervids.
- a. HDOA reported that wildlife baiting and feeding by hunters is not a common practice on Moloka'i, a sentiment that was echoed by the HDOA Livestock Inspector that has lived on the island for many years. An official wildlife feeding

- ban may have little impact on changing the risk of wildlife interaction with livestock, but it may be perceived negatively by the public as unnecessary regulatory interference with hunting and may hamper efforts to gain cooperation with other program activities. HDOA should consult with Hawaii Department of Land and Natural Resources (DLNR) to determine if public wildlife baiting and feeding is prevalent on Moloka`i and if an official DLNR ban is warranted.
- b. Recommendation: HDOA should request HI DLNR to place an official ban on public wildlife baiting and feeding or should provide written justification to APHIS explaining why it will not be implemented.
8. Performance standards, as appropriate, must be implemented to measure yearly progress toward eradication.
 - a. HDOA, WS, and VS are actively involved in multiple wildlife TB projects on Moloka`i and shared surveillance data with the review team during the 2024 review. Article 5 of the MOU requires reporting of “wildlife surveillance testing summary” as a metric to include in annual TB reports but it doesn’t define what testing summary metrics should include because wildlife surveillance was still under development at the time the MOU was written.
 - b. Recommendation: Add the following summaries in the annual TB report:
 - i. List of active wildlife mitigation strategies and their status.
 - ii. Total count and brief description of producer or public outreach meetings conducted throughout the year. Include number of “hits” on TB associated HDOA public facing websites.
 - iii. Annual number of wildlife tissue sample submissions submitted to NVSL for TB testing. This should include both VS 10-4 field submissions and VS 6-35 slaughter inspection submissions.
 - iv. Annual number of wildlife carcass inspections conducted under FSIS inspection by species.
 - v. Annual number of wildlife carcass inspections conducted by HDOA, VS or WS field staff by species.

IV. Other Findings and Recommendations

1. During the 2023 TB review, limited availability and high cost of feed was identified as a major burden for livestock producers undergoing herd testing. Some livestock producers must move cattle to shared handling facilities to conduct herd testing over three or more days, and feed supplementation during this confinement can be very costly. Since the 2023 review, HDOA identified funds to help provide feed and alleviate financial burden on producers undergoing herd testing. This assistance was positively received and improved cooperation with regulatory herd testing. Availability of long-term funding for this feed assistance is not clear, but the benefit to producers and cooperation warrants continued support.

- a. Recommendation: Continue feed assistance support for livestock producers undergoing herd testing.
2. HDOA proposed the development of a livestock feeding operation protected from wildlife. This facility would allow local Moloka`i producers to raise and market feeder cattle off the island. Moloka`i has a long history of beef cattle production, but quarantine restrictions place a strain on the viability of the already dwindling number of cattle producers that remain on the island.
 - a. Recommendation: HDOA and VS schedule meetings in FY 2025 to discuss the feasibility of a Moloka`i cattle production program and feeding facility to allow marketing of cattle off island if accepting destination states are identified.
3. The 2023 HI TB program review recommended that *APHIS VS should continue to support expansion of national gamma testing capabilities.*
 - a. APHIS VS NVSL was still in the process of validating the QuantiFERON-TB Gold® (QFT) Assay at the time of the 2024 review. The timeline for completion of validation is unknown and dependent on the ability to collect positive control samples for testing. QFT testing, when validated and incorporated into the TB Program, would allow Hawaii to utilize Interferon Gamma Release Assay (IGRA) based testing in lieu of CCT's for herd testing, which could potentially reduce the length of time herds must be kept in confinement and reduce travel for off-island VMO's.
 - b. Assessment: Response in progress.
 - c. Recommendation: APHIS VS should continue to support validation of the QuantiFERON-TB Gold® (QFT) Assay.

Conclusion

The HDOA, in collaboration with APHIS, administers a cooperative Bovine TB Eradication Program that faces several unique challenges, including a wildlife disease reservoir, difficulty filling State government job positions, and logistical difficulties associated with island cattle production. The 2024 Hawaii TB program review focused on three primary objectives: (1) response to 2023 program review recommendations, (2) compliance with the current MOU, and (3) evaluation of the status of wildlife surveillance activities as they pertain to the USDA Bovine Tuberculosis Eradication UM&R.

HDOA made significant progress with most 2023 recommendations and MOU responsibilities after the 2023 review. Improved efficiency and producer cooperation with herd testing, creation of a feed assistance program, and initiation of the wildlife camera surveillance project highlighted the successes. The TB Initiative-funded wildlife camera surveillance project is a critical step in the development of a long-term wildlife surveillance plan and the overall Hawaii TB management program. Wildlife surveillance on Moloka`i is a difficult project due to the lack of existing data on wildlife populations and the logistical challenges of obtaining that information with the camera project. HDOA's desire to administer an effective TB program is

apparent in their strong collaboration with WS and VS and desire to explore long-term strategies and planning.

Despite the improvements made since the 2023 TB program review, significant gaps still exist, many of which are rooted in the difficulty filling open HDOA job positions on Moloka`i. HDOA filled some open field positions across the State in the past two years but has not had success recruiting local Moloka`i residents to fill open positions on the island. The shortage of local personnel and livestock handling equipment continue to hamper field work, especially implementation of the BBH program, leading to a gap in traceability on the island.

Most recommendations identified in this report are based on issues that could be rectified by hiring additional personnel and through continued progress with the wildlife surveillance project. The review team did not find willful non-compliance or issues with interagency cooperation during the review.

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