KISC KAUAI INVASIVE SPECIES COMMITTEE	*Kauai Status*	*KISC Status*	*HPWRA*	*Invasive Impacts Score*	*Feasibility Score*	*Combined Score*
Canavalia sericea (silky jackbean)	**NATURALIZED**	**EARLY DETECTION**	**EVALUATE (2)**	**5**	**5.5**	**10.5**

Initial Prioritization Assessment completed: January 2018
Report updated as of: N/A
Current Recommendation for KISC: Pending Ranking and Committee approval
Knowledge Gaps and Contingencies:

1) Delimiting surveys along the eastern coast of Kauai is necessary to ensure it hasn't spread beyond its known distribution
2) A plan for controlling plants situated next to beaches and the high water mark is necessary.

Background

Canavalia sericea (Fabaceae) or "silky jackbean" is a trailing, woody vine that has occasionally been cultivated in Hawaii since 1930 (Staples and Herbst 2005). *C. sericea* has not been considered for control by KISC in the past, and thus, this prioritization assessment report was written to evaluate whether KISC should attempt to eradicate (i.e. accept "Target" status) this plant from Kauai. This will be informed by scoring this plant relative to other "Early Detection" species known to Kauai (See Table 5 in KISC Plant Early Detection Report for status terminology).

Detection and Distribution

Herbarium records indicate that *C. sericea* has been present on Kauai at least since 1990 (T. Flynn. 3727, PTBG). Statewide, *C. sericea* is considered naturalized on Kauai, Oahu, Maui and Hawaii Island (Imada 2012). 2015-2017 surveys detected two locations of this plant at Aliomanu and Kapaa. However, additional herbarium voucher data indicates that this plant is sparingly naturalized in coastal areas from Aliomanu to Lydgate Beach Park south of Wailua (Figure C8- 1). This plant produces floating seeds that can disperse long distances by sea. The current distribution of *C. sericea* suggests that seeds are dispersing from mature plants along the east coast of Kauai via the ocean. Although *C. sericea* is a vine, it tends to trail along the ground, making it difficult to detect (Staples and Herbst 2005). As the entire length of beaches and other ideal coastal habitats were not surveyed in detail, it is likely that some plants remain undetected along the east coast of Kauai. Current data suggests that *C. sericea* has naturalized within two judiciary districts (Kawaihau, Lihue) and along the coasts of four watersheds (Kawailoa, Waikaea, Moikeha, Aliomanu).

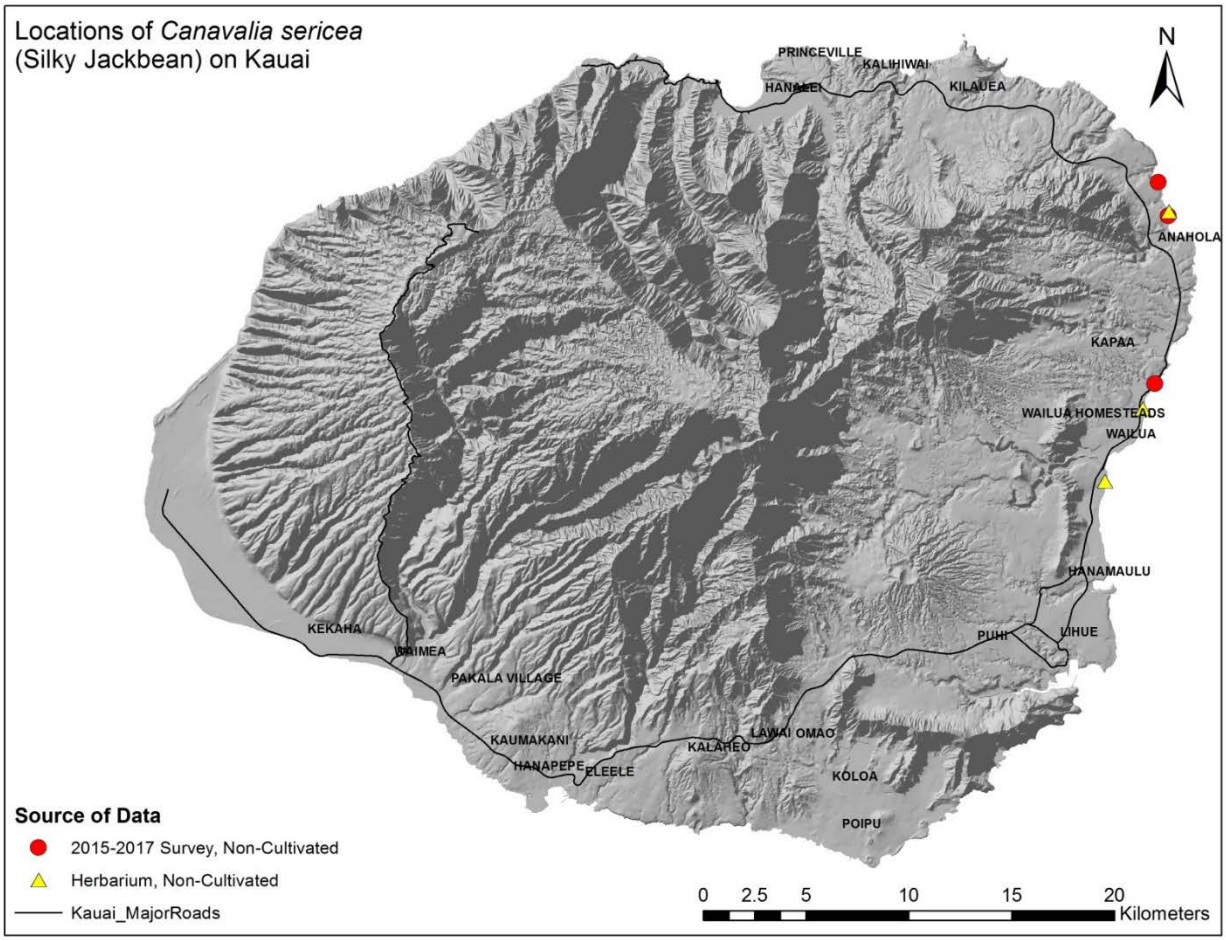

Figure C8- 1. Locations of *C. sericea* on Kauai. Locations that were detected during 2015-2017 surveys are denoted by red circles.

Hawaii Pacific Weed Risk Assessment (HPWRA) Score

C. sericea is designated as "Evaluate", receiving a score of 2 (Daehler et al. 2004, HPWRA 2017). Traits contributing to this status are listed below according to whether they pertain to the likelihood a plant will invade vs. the consequences of the invasion, according to Daehler and Virtue (2010). As this particular assessment resulted in an "Evaluate" rather than a "High Risk" score, traits lowering the score are also listed alongside asterisks (*). Categorization of traits in this manner more accurately informs invasive impact potential scoring and prioritization of species that are already established on Kauai.

Likelihood of Invasion	*Consequences of Invasion*
• Well suited to climates in Hawaii • Naturalized outside of its native range • Produces viable seed • Propagules dispersed intentionally by people • Propagules dispersed by water • Propagules unlikely to be dispersed unintentionally by people or as a contaminant* • Propagules not dispersed by wind, birds or other animals*	• A congeneric weed, sharing a genus with other known invasive species (i.e. implies inheritance of tendencies to inflict invasive impacts) • Climbing and smothering growth habit

Refer to the full Weed Risk Assessment for *C. sericea* at https://sites.google.com/site/weedriskassessment/assessments/Download-Assessments.

Invasive Impacts Score

An assessment of potential invasive impacts is especially difficult for this occurrence as identification issues add uncertainty to predictions. For the purposes of assessing potential impact, research is based on behavior of *C. sericea* and publications relating to the entire genus as all representatives of the group occupy coastal habitats, where applicable.

1. Impact on natural community structure and/or composition

Score: 2 = Moderate impacts

C. sericea was assigned a score of 2 based mostly on Hawaii-specific observations, as Hawaii is the only region where it has been recorded naturalizing outside of its native range (Wagner et al. 1999, Malcolm 2012). On Kauai, *C. sericea* was observed during 2015-2107 surveys naturalizing along coastal strand vegetation in Aliomanu and Kapaa, where it forms a low, sprawling ground cover that also occasionally climbs over native shrubs including *Scaevola taccada (*naupaka; Figure C8- 2). *C. sericea* has been observed on Maui forming dense mats in coastal areas, although it is unknown how large and common these patches are (H.L. Oppenheimer H119922, BISH; Figure C8- 3). *C. sericea* is a common plant of other Pacific island coastal strand ecosystems, which contain many of the same indigenous species present on Hawaii's coasts. A summary of coastal habitats in Fiji states that *C. sericea* is the second most abundant coastal creeper after *Ipomoea pes-caprae* (beach morning glory) which is also indigenous to Hawaii (Ghazanfar et al. 2001). These distribution and abundance observations imply that *C. sericea* is likely capable of competing with native species, and may eventually form a sizable component of Hawaii's coastal vegetation via ocean based seed dispersal. However, it may not be capable of dominating and excluding native species such as *I. pes-caprae* over broad spatial scale in these habitats. Coastal areas remain one of the last lowland ecosystems in most of the Hawaiian Islands where one can find native-dominated vegetation, as few alien species can tolerate the wind shear and saline conditions of these sites. Thus, the spread of species that are capable of competing with stress tolerant native species in coastal environments should be monitored carefully. Additionally, *C. sericea* is naturalizing within two POPREF polygons containing PEP plants (Aliomanu-ALI, Kapaa-KAP). Although it is not whether any the PEP plants inhabit coastal areas, and species inhabiting other ecosystems are unlikely to be impacted by this coastal specialist.

Figure C8- 2. Photo of *C. sericea* (silver undersided leaves) naturalizing along a coastal strand at Kapaa Beach Park on Kauai alongside the native *Scaevola taccada* (naupaka).

Figure C8- 3. Photo of *C. sericea* forming a low, dense mat at Waiehu Beach Park on Maui (Photo credit K & F Starr).

2. Impacts to Agriculture, Culture and other Human Systems

Score: 1 = Minor impacts

C. sericea received a score of 1 because little is known of its ability to invade human-managed systems and naturalized populations will likely remain confined to coastal habitats. However, this plant was observed growing up to 1.5 meters over woody shrubs in Aliomanu in 2015-2017. Thus, some may consider the growth habit of this plant to detract from the aesthetic quality of beach environments.

Figure C8- 4. *C. sericea* climbing up *Thespesia populnea* (Milo) in Aliomanu, Kauai.

3. Impacts to biotic and abiotic processes

Score: 2 = Moderate Impacts

C. sericea received a score of 2 in this section because although no specific soil interaction data exists for this species, other members of the Fabaceae are well-known for their ability fix nitrogen (Masutha et al. 1997, Thorpe et al. 2013, Nunes et al. 2016). One study investigating the effects of legumes on soil recommended non-host specific rhizobium bacteria inoculations contained in other *Canavalia* species to fix nitrogen and increase soil carbon uptake in sandy soils (Sridhar et al. 2005). This implies that perhaps moderate effects to soil from *C. sericea* are possible, although the magnitude of this effect ultimately depends on how widespread and dense *C. sericea* is likely to become on Kauai.

TOTAL INVASIVE IMPACTS SCORE: 5

Feasibility of Control Score

Feasibility of Control Scoring and rationale for *C. sericea* is presented below. Refer to Appendix A for details regarding the Invasive Impact Score.

Delimiting Survey:

Score: 2 = Moderate Effort

Feasibility of a delimiting survey for *C. sericea* was given a score of 2 because a survey of at least the eastern shoreline of Kauai is required to delimit the population due to long-distance dispersal by floating seeds. The low stature of this plant, its superficial resemblance to the native *Vigna marina* from a distance, as well as its preference for coastal areas increases the likelihood that some sites were not detected during 2015-2017 surveys, which focused on roadways. Particularly, the shoreline between Aliomanu and Lydgate Beach Park must be surveyed in more detail.

Initial control:

Score: 2 = Moderate Effort

Feasibility of initial control for *C. sericea* was given a score of 2 because although no large, dense infestations were found, the proximity of these plants to ocean and public beaches may pose a problem for chemical control. Manual removal will not be easy since stems are woody and are often intertwined with native vegetation. An assessment by the crew is required to determine a suitable method for control, which may change this scoring.

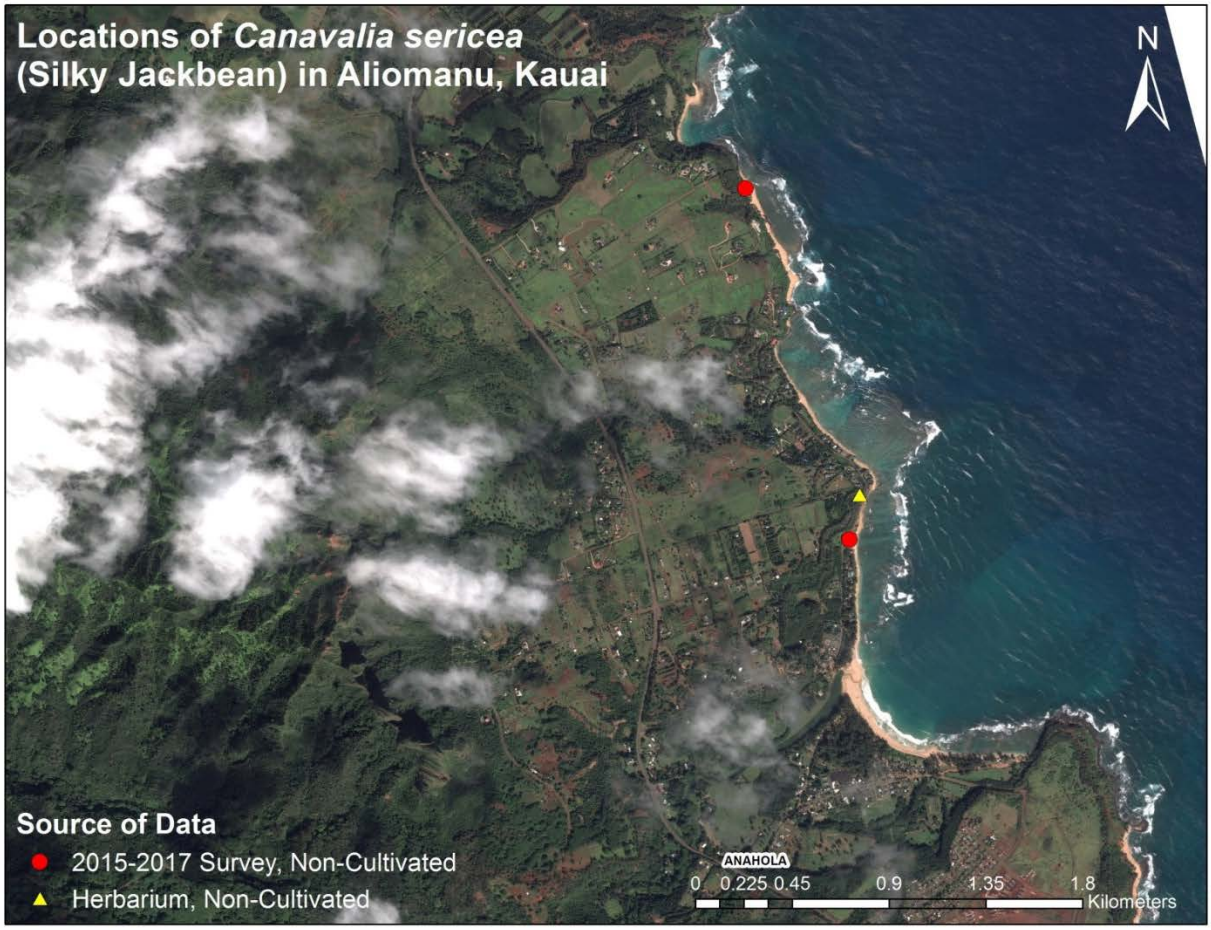

Figure C8- 5. Map of *C. sericea* in Aliomanu, where it has been naturalized at least since 1990, showing its coastal distribution.

Monitoring:

Score: 1.5 = Major-Moderate Effort

No species-specific information is available to predict the ability *C. sericea* seeds to persist in the soil on Kauai. However, many Fabaceae seeds are able to form a persistent seed bank (Kestring et al. 2009, de Casas et al. 2017, Liyanage and Ooi 2017). Additionally, members of the genus *Canavalia* as well as other members of this family are well known to have floating, ocean-adapted seeds capable of pan-tropical dispersal, implying that seeds are able to remain viable at sea or in non-ideal conditions for long periods of time (Moura et al. 2016, Snak et al. 2016). As *C. sericea* has established naturally throughout the pacific islands (Wagner et al. 1999, HPWRA 2017), it is possible that seeds dispersed from naturalized populations elsewhere in Hawaii may re-establish on Kauai's coasts. Staples & Herbst (2005) attest that the plant produces numerous seeds and plants at Aliomanu were observed setting seed on Kauai. Additionally, it is not known how long this plant takes to mature, making it difficult to plan monitoring intervals to ensure eradication. However, this score ultimately depends on the number of sites detected during delimiting surveys and may be adjusted according to maturity status and site accessibility.

FEASIBILTY OF CONTROL SCORE: 5.5

COMBINED SCORE: 5 + 5.5 = 10.5

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