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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

April 26, 2012

TO: Gary Hooser, Director
Office of Environmental Quality Control

FROM: William Aila, Chairperson
Department of Land and Natural Resources

SUBJECT: Request for Publication of Draft Round-leaved Chaff Flower (*Achyranthes splendens* var. *rotundata*) Habitat Conservation Plan for Kenai Industrial Park Project, O'ahu, Hawai'i, and Associated Incidental Take License, in the May 8, 2012, Environmental Notice

The State of Hawai'i Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) has reviewed the Draft Round-leaved Chaff Flower (*Achyranthes splendens* var. *rotundata*) Habitat Conservation Plan (HCP) for Kenai Industrial Park Project, O'ahu, Hawai'i, and associated Incidental Take License (ITL) and is opening a public comment period. Please publish a notice of this action in the May 8, 2012 OEQC Environmental Notice.

We have enclosed a completed OEQC Publication Form, and copies of the draft HCP, draft ITL, and HCP application. All are provided in PDF format on a CD and hardcopy. Please contact Kathryn Stanaway, DOFAW Habitat Conservation Planning Associate, at (808) 587-4149 or by email at Kathryn.E.Stanaway@hawaii.gov, if you have any questions.

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Publication Form
The Environmental Notice
Office of Environmental Quality Control

Name of Project: Draft Round-leaved Chaff Flower (*Achyranthes splendens* var. *rotundata*)
Habitat Conservation Plan for the Kenai Industrial Park Project and Incidental
Take License

Applicable Law: HRS Chapter 195D

Type of Document: Draft Habitat Conservation Plan and Incidental Take License

Island: Oahu

District: Geographic District

TMK: TMK 9-1-074:023

Permits Required: Incidental Take License

**Name of Applicant or
Proposing Agency:** CIRI Land Development Company
2525 C Street, Suite 500
Address Anchorage, Alaska 99503
City, State, Zip 907 274-8638
Contact and Phone

**Approving Agency
or Accepting
Authority:** Department of Land and Natural Resources
Division of Forestry and Wildlife (DOFAW)
1151 Punchbowl Street, Room 325
Address Honolulu, HI 96815
City, State, Zip 808 587-0166
Contact and Phone

Consultant AMEC Environment & Infrastructure, Inc.
Address 3049 Ualena Street, Suite 1100
City, State, Zip Honolulu, HI 96819
Contact and Phone 619 838-4034

Project Summary:

CIRI Land Development Company (or the "Applicant") is proposing to develop a 0.75-acre site with a 62-unit self-storage facility in Kapolei on the Island of O'ahu, Hawai'i

The construction of the Project will result in the incidental take of one plant species listed under the federal Endangered Species Act (ESA) of 1973, as amended, and the State of Hawai'i endangered species statutes known as the round-leaved chaff flower (*Achyranthes splendens* var. *rotundata*).

To address potential take and to comply with Hawai'i endangered species law, Hawai'i Revised Statutes Chapter 195D, the Applicant developed a Habitat Conservation Plan (HCP) that outlines measures to avoid, minimize, mitigate, and monitor take of the aforementioned covered endangered species. In addition, the HCP outlines measures to ensure a net recovery benefit to the species that are the focus of the plan.

The public is encouraged to comment on this amendment. Please send comments to: Department of Land and Natural Resources, Division of Forestry and Wildlife, 1151 Punchbowl Street Room 325, Honolulu, Hawai'i 96813. Attention: HCP Planning Associate or email comments to: Kathryn.E.Stanaway@hawaii.gov

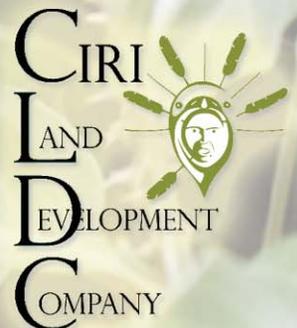
Public comments should be received by July 8, 2012.

Draft
Round-leaved Chaff Flower
(*Achyranthes splendens* var. *rotundata*)
Habitat Conservation Plan for the
Kenai Industrial Park Project
Kapolei, County of Honolulu, Hawaii 96707

Prepared for:
CIRI Land Development Company
2525 C Street, Suite 500
Anchorage, Alaska 99503

Prepared by:
AMEC Environment & Infrastructure, Inc.
3049 Ualena Street, Suite 1100
Honolulu, Hawaii 96819

March 2012
AMEC Project No. 1047100002





12 March 2012
AMEC Project No. 1047100002

Sandee Hufana
Conservation Initiative Coordinator
Hawai'i Department of Land and Natural Resources
Division of Forestry and Wildlife
1151 Punchbowl Street, Room 325
Honolulu, Hawai'i 96813

Re: Round-leaved Chaff Flower Habitat Conservation Plan for the Kenai Industrial Park Project

Dear Ms. Hufana,

On behalf of CIRC Land Development Company (CLDC), AMEC Environment & Infrastructure, Inc. (AMEC) is pleased to submit the Draft *Round-leaved Chaff Flower (Achyranthes splendens var. rotundata) Habitat Conservation Plan* (HCP) to the State Department of Land and Natural Resources (DLNR) in support of the Kenai Industrial Park (KIP) Project.

This HCP has been prepared pursuant to Chapter 195D (Sections 4 and 21) of the Hawai'i Revised Statutes (HRS) for the incidental take of round-leaved chaff flower, a federal and state listed endangered species. It seeks to offset impacts to round-leaved chaff flower that would result from the proposed development by implementing measures that would protect and perpetuate the species as a whole. The HCP provides a description of the development actions and minimization and mitigation strategies.

If you have any questions or concerns regarding this HCP, please contact me at (619) 838-4034 or halleh.paymard@amec.com.

Respectfully submitted,

AMEC Environment & Infrastructure, Inc.

Halleh Paymard
Botanist

Cc: Dave Pfeifer, CIRC Land Development Company

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AMEC Environment & Infrastructure, Inc. (AMEC) is pleased to submit this *Round-leaved Chaff Flower (Achyranthes splendens var. rotundata) Habitat Conservation Plan (HCP or Plan)* to the State Department of Land and Natural Resources (DLNR) on behalf of CIRI Land Development Company (CLDC or Applicant) in support of the Kenai Industrial Park (KIP) Project.

This HCP has been prepared pursuant to Chapter 195D (Sections 4 and 21) of the Hawai'i Revised Statutes (HRS) for the incidental take of round-leaved chaff flower, a federal and state listed endangered species. It seeks to offset impacts to round-leaved chaff flower that would result from the proposed development by implementing measures that would protect and perpetuate the species as a whole. The Plan provides a description of the development actions and minimization and mitigation strategies.

As currently designed, the entire 0.75 acre KIP Project site will be developed as a 62-unit self storage facility. A conceptual development plan of the site is presented in Appendix A. The proposed construction and operation of the facility would result in direct incidental take of two round-leaved chaff flower individuals.

In order to offset impacts to round-leaved chaff flower from the development of the KIP Project, CLDC proposes to conduct in-kind off-site mitigation in the form of habitat restoration and creation. The proposed off-site mitigation area is located on preserved lands of the Pearl Harbor National Wildlife Refuge (NWR) Kalaeloa Unit located approximately 2 miles from the project site. The Pearl Harbor NWR Kalaeloa Unit was created to recover and restore native Hawai'ian plant species that once dominated the 'Ewa Plain. This area is considered one of the best examples of the remaining coastal plant ecosystem in the State.

This HCP outlines a mitigation strategy that would create new populations of round-leaved chaff flower on the Kalaeloa Unit from the genetic stock (seeds and cuttings) of the two individuals that will be impacted as a result of the KIP project. The exact outplanting locations will be coordinated with NWR staff based on suitable habitat.

The intent of these activities is to 1) maintain genetic representation of the original population by growing cuttings and seeds in nurseries for outplanting efforts and placing seeds in a seed storage facility (Lyon Arboretum); and 2) to establish new wild populations within protected suitable habitat located on Pearl Harbor NWR Kalaeloa Unit.

The Applicant anticipates a 5-year project life, throughout which this HCP would be in effect. The provisions provided herein for adaptive management would allow flexibility and responsiveness to new information throughout the duration of the HCP.



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AMEC	AMEC Environment & Infrastructure, Inc.
amsl	above mean sea level
CCP	Comprehensive Conservation Plan
CIRI	Cook Inlet Region, Inc.
CLDC	CIRI Land Development Company
DLNR	State Department of Land and Natural Resources
DOFAW	Division of Forestry and Wildlife
GPS	Global Positioning System
HCP	Habitat Conservation Plan
HRPRG	Hawaiian Rare Plant Restoration Group
HRS	Hawai'i Revised Statutes
IPM	Integrated Pest Management
ITL	Incidental Take License
KIP	Kenai Industrial Park
MMP	Mitigation Monitoring Plan
NAS	Naval Air Station
NWR	National Wildlife Refuge
NRCS	Natural Resources Conservation Service
PTP	Pacific Tower Properties, Inc.
WRCC	Western Regional Climate Center
USDA	U.S. Department of Agriculture
USFWS	United States Fish and Wildlife Service

AMEC Environment & Infrastructure, Inc. (AMEC) is pleased to submit this *Round-leaved Chaff Flower* (*Achyranthes splendens* var. *rotundata*) *Habitat Conservation Plan* (HCP or Plan) to the State Department of Land and Natural Resources (DLNR) on behalf of Cook Inlet Region, Inc. (CIRI) Land Development Company (CLDC or Applicant) in support of the Kenai Industrial Park (KIP) Project.

This HCP has been prepared pursuant to Chapter 195D (Sections 4 and 21) of the Hawai'i Revised Statutes (HRS) for the incidental take of round-leaved chaff flower, a federal and state listed endangered species. It seeks to offset impacts to round-leaved chaff flower that would result from the proposed development by implementing measures that would protect and perpetuate the species as a whole.

The Plan provides a description of the development actions and proposes minimization and mitigation strategies. Successful implementation of these mitigation efforts would significantly increase the numbers of new plants on O'ahu by establishing a wild, self sustaining population, as well as improve their quality compared to the in situ disturbed location of the KIP site. These mitigation efforts would also protect the genetic diversity of the existing population and protect existing individuals by relocating them to appropriate habitat within preserved lands.

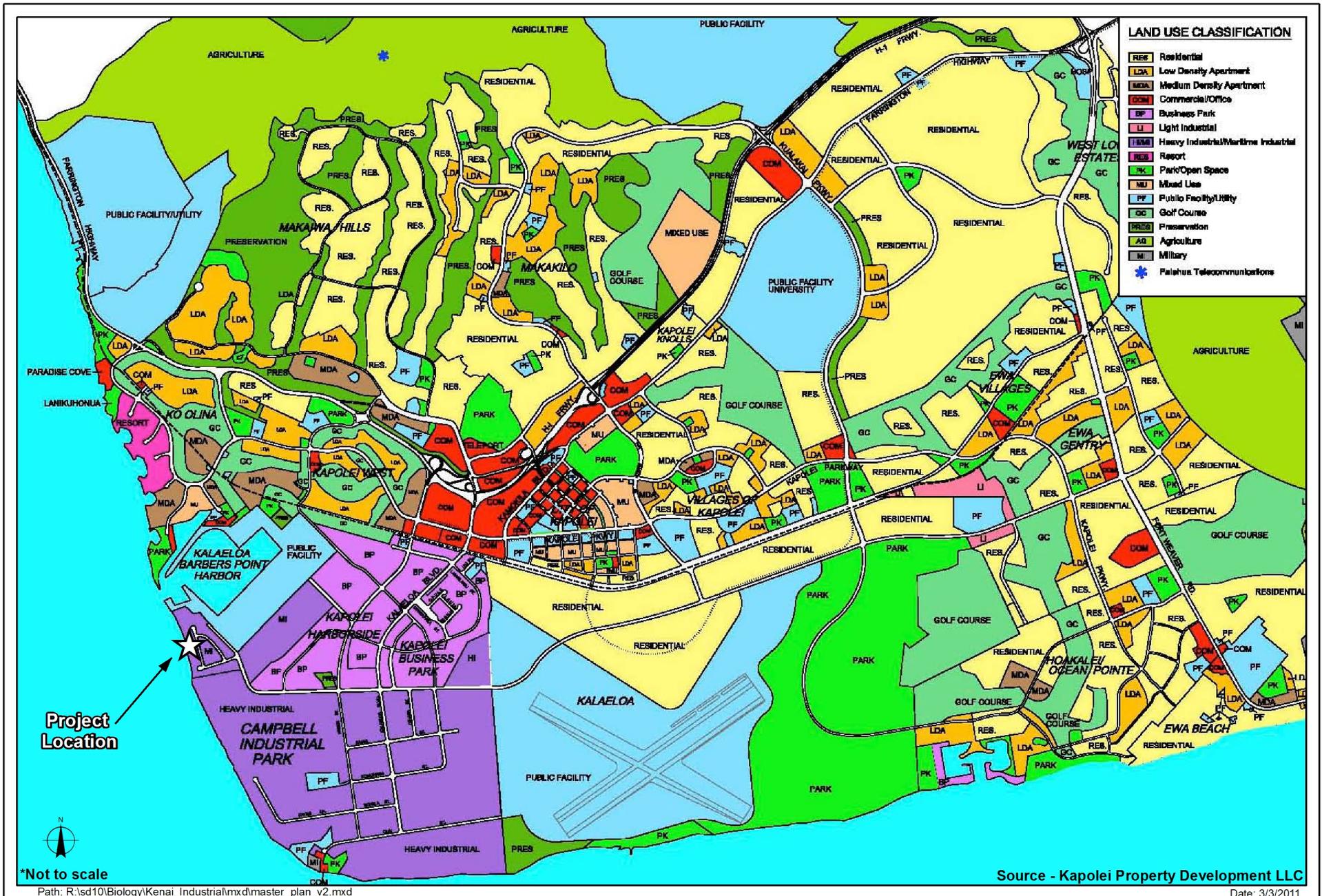
The Applicant anticipates a 5-year project life, throughout which this HCP would be in effect. The provisions provided herein for adaptive management would allow flexibility and responsiveness to new information throughout the duration of the HCP.

□□□ □□**Project Location and Description**□□□□□□□□

The proposed KIP site is an undeveloped 0.75 acre parcel located at Lot No. 25 Malakole Street in Kapolei, on the island of O'ahu, Hawai'i (Figures 1 and 2). Kapolei is an unincorporated community in Honolulu County and is the second urban center on the island of O'ahu, next to Honolulu.

The KIP site is located within the northwestern portion of Campbell Industrial Park which is southwest of the Kapolei city center. Campbell Industrial Park is the largest industrial park in Hawai'i comprised of approximately 1,380 acres of nearly 250 industrial and commercial businesses (Figure 3). Land use within the project area is designated as 'heavy industrial/maritime industrial' use (Figure 3; City of Kapolei 2010).

CLDC proposes to develop the entire 0.75 acre parcel for industrial purposes similar to the land use located in the bordering parcels of the subdivision. As currently designed, the site will be developed as a 62-unit self storage facility. Appendix A provides a conceptual development plan for the site. Construction of the project would likely occur as soon as practicable after all permits and authorizations have been obtained.



Land Use
 Round-leaved Chaff Flower Habitat Conservation Plan
 Kenai Industrial Park Project, Kapolei, Hawaii

FIGURE

3

Development activities associated with the storage unit facility would likely include the following components:

- Clearing and grubbing the entire site;
- Grading the entire site;
- Installation of drainage conveyance structures;
- Installation of facility foundations and driveways;
- Construction of storage structures and office facility;
- Construction of protective security fencing.

CLDC is a wholly owned subsidiary of CIRI. CIRI is an Alaska Native corporation. It is one of 12 Alaska-based regional corporations established by the Alaska Native Claims Settlement Act of 1971 to benefit Alaska Natives who had ties to the Cook Inlet region. The Company is owned by more than 7,300 Alaska Native shareholders of Athabascan and Southeast Indian, Inupiat, Yup'ik, Alutiiq and Aleut descent.

CLDC is a real estate development, investment and property management company with a commercial real estate portfolio located primarily in Alaska, Texas, California, and Hawai'i. CLDC is a certified Minority Business Enterprise. CLDC's holdings include all major commercial real estate asset classes.

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1.1.1 Regional Location

1.1.1.1 Climate

The project area is located on the leeward physiographic zone of O'ahu. This geographic location results in lower rainfall, larger drainage basins, and more intermittent streams than regions more exposed to trade winds. During the dry season, day temperatures are between 87-89°F and night temperatures range between 72-76°F. Wet season temperatures are slightly lower, with day temps ranging between 76-78°F. The difference between day and night temperatures varies by 15-20°F. Average relative humidity in the region varies between 58- 60 percent. On the windward or northeastern side of O'ahu, climatic conditions are relatively wet and strongly influenced by patterns of orographic rainfall. The leeward areas in the southern and western portion of the island experience decreased winds, less rain, and are subject to southerly Kona storms (USFWS 2010).

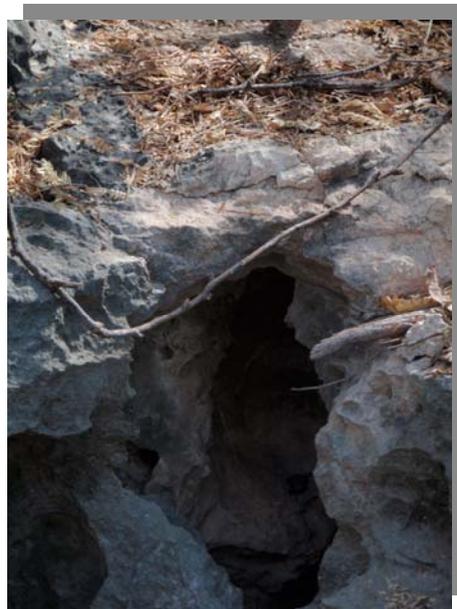
Data collected at the Campbell Industrial Park weather station (Station 510248) between 1971 and 2010 reported a minimum monthly average of 72.9°F in January and a maximum of 81.8°F in August (Western Regional Climate Center [WRCC] 2011). The mean annual precipitation in the area is approximately 19.8 inches, with winter months receiving the most rainfall (WRCC 2011).

1.1.1.2 Geographical and Soil

The elevation of the project site is approximately 3 feet above mean sea level (amsl). The surrounding area is approximately 3 feet higher in elevation than the project site. The project area terrain consists of karst topography with numerous eroded solution sinkholes.

The KIP site is located on the coastal 'Ewa Plain, which encompasses the southwestern portion of the island of O'ahu (Figure 1). The 'Ewa Plain was formed by sea level changed during the Pleistocene era roughly 2-3 million years ago. This area is underlain by a broad platform of elevated limestone reef material and partially covered by accumulated alluvium from the mountains. The raised coralline limestone within the 'Ewa Plain was partially caused by upward seafloor warping and tilting of the larger islands of Maui and Hawai'i (USFWS 2010).

Karst topography and solution sinkholes or anchialine pools are characteristic of the 'Ewa Plain. Sinkholes are a type of karstic structure that is formed by the dissolution of the consolidated and cemented hard limestone. Sinkholes in hard limestone are openings into the hypogeal water table and often contain anchialine ponds in Hawai'i. Typically, these sinkholes are bell-shaped in profile; the surface opening is often approximately 1 meter (3 feet) or so in diameter, with the interior usually increasing to two or three times that. Sinkholes within



Karst topography and sinkholes located within the project site.

the 'Ewa Plain have been found to contain innumerable bones of extinct Hawaiian bird species and endemic crustacean species (Ziegler 2002).

Soils within the project site are classified as coral outcrop by the U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) (NRCS 2011). Coral outcrop is comprised of coral or cemented calcareous sand and can be found on O'ahu between 0-100 feet in elevation. It is geographically associated with Jaucas, Kea'au, and Mokulē'ia soils. A red thin friable layer of soil material can be found within the cracks, crevices, and depressions of the coral outcrop. Nonnative vegetation typically grows within soils mapped as coral outcrop (USDA 1972).

Vegetation Community

The primary vegetation community within the project area consists of the dry coastal shrubland community. The dominant overstory species within the site consists of nonnative kiawe (*Prosopis pallid*), a federally listed noxious species of mesquite tree. Associated species along the northeast side of the parcel include sourbush (*Pluchea carolinensis*) and along the northwest and southwest sides, buffelgrass (*Cenchrus ciliaris*) and other grasses such as guinea grass (*Panicum maximum*). Pickleweed (*Batis maritima*), a succulent-leaf shrub common to saline soils and brackish water, is also common within the understory of the southeast portion of the property (Morden & Associates 2008).

Special Plant Species

Two individuals of round-leaved chaff flower, a federal and state listed endangered species, have been documented within the project site (Figure 2). One healthy 1 meter (3 foot) tall individual occurs within a crack of exposed limestone and a much smaller individual occurs within similar conditions, 18 inches east of its larger counterpart (Appendix C).

Round-leaved chaff flower was first documented on the project site during a botanical survey conducted in 1985 by Dr. Arthur Whistler. Dr. Whistler described round-leaved chaff flower to be the dominant understory species within the site. Approximately 116 individuals of round-leaved chaff flower were recorded at various stages of growth within the property (Morden & Associates 2005).

Subsequent to the 1985 survey, Morden & Associates conducted botanical surveys within the parcel in 2005, 2007, and 2008 (Morden & Associates 2005, 2007 and 2008). The 2005 survey concluded that the species was absent from the site (Morden & Associates 2005); however, subsequent surveys noted the two individuals discussed above, as well as several smaller seedlings that have since been extirpated (Morden & Associates 2008). Appendix B presents the results of the Morden & Associates botanical surveys of the site.

Representatives from the DLNR and AMEC conducted a site visit on 19 July 2010. The two individuals of round-leaved chaff flower were observed during this visit; no other individuals were observed. Appendix C presents photographs of the site and round-leaved chaff flower individuals that were taken during the 19 July 2010 site visit.

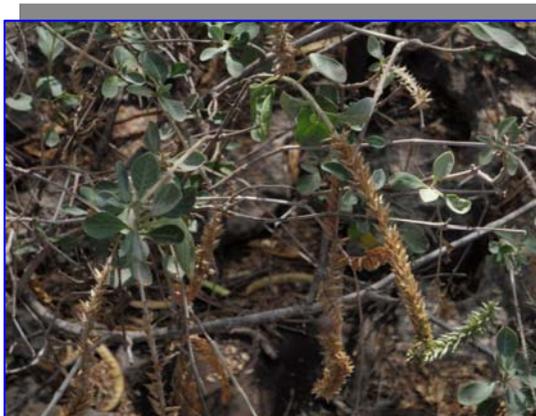
Round-leaved chaff flower conservation plan

Federal Status: Endangered (1986); Draft Recovery Plan (1984)

State Status: Endangered; Endemic

Species description

Round-leaved chaff flower or 'Ewa hinahina is a shrub of the Amaranth family (Amaranthaceae or Kulu'i) that grows to a height of 2-6 feet. The elliptic leaves of this species have dense, light-colored hairs that produce a silvery color. The tiny flowers are closely spaced on long, unbranched spikes. The shrub is characterized from the other variety of this species (*A. splendens* var. *splendens*) by shorter sepals and bracts; its sepals measure 0.26 to 0.35 inches long and bracteoles have a length of 0.14 to 0.2 inches (Wagner et al. 1999). Most vegetative growth occurs during the wet winter season and, as the dry summer months approach, vegetative growth slows and flowering occurs. In mid-summer to early fall, fruiting plants become dormant but do not lose their leaves. Seeds, dispersed by wind and gravity, germinate during the summer (USFWS 1994). The inflorescences and leaves of round-leaved chaff flower have been used for traditional lei making; however, this use appears to have ended (USFWS 2009).



Round-leaved chaff flower (*Achyranthes splendens* var. *rotundata*) located within the project site.

Round-leaved chaff flower has successfully been propagated by seed and cutting. Each dry fruit contains a single seed, and while a high percentage of non-viable seed are found in some batches, viable seed has been reported to have a 90 percent germination success rate (USFWS 2009).

Habitat Requirement

Round-leaved chaff flower is an extremely salt and drought tolerant plant that prefers limestone substrates covered with a thin surface layer of soil and pockets of humus. It typically occurs in open or closed kiawe forests, as well as in open shrub communities characterized by other nonnative species such as koa haole (*Leucaena leucocephala*), pickleweed, and fleabane (*Pluchea* spp.). This species has also been noted in association with two native species, maiapilo (*Capparis sandwichiana*) and naio (*Myoporum sandwicense*). Round-leaved chaff flower is endemic to low altitude sites up to 100 feet in elevation (USFWS 2010).

Distribution

Historically, round-leaved chaff flower was found on arid and semi-arid coastal lowlands of O'ahu, Moloka'i, and Lana'i. Today, it is only known from two fragmented populations, grouped along the northwestern and southwestern boundaries of the species historic range on O'ahu (Figure 4). Currently, the largest native remnant stand occurs at the Kalaeloa Unit of the Pearl Harbor National Wildlife Refuge (NWR) which is part of the O'ahu NWR Complex (Figure 1).

Listing Status

Round-leaved chaff flower was listed as a federally endangered plant species in 1986 (USFWS 1986). The species was originally listed as *A. rotundata* and subsequently renamed *A. splendens* var. *rotundata* (USFWS 1994). Critical habitat was not designated at the time of listing due to concern for potential vandalism or unauthorized collection (USFWS 2010). Downlisting and delisting objectives were developed in a draft recovery plan for this species in 1994 (USFWS 1994). According to herbarium labels, it was regarded as "frequent" in 1937 and "common" as recently as 1968 (USFWS 1994). At the time of federal listing in 1986, only two populations consisting of two individuals at Kaena Point State Park, and approximately 400 individuals at Barbers Point, within the 'Ewa Plain, were known on O'ahu. The populations on Moloka'i and Lana'i were already extirpated at the time of listing (USFWS 1986).

Habitat

Round-leaved chaff flower has had 88 percent of its historic range reduced by habitat conversion largely for industrial and agricultural developments, and the remaining 12 percent of habitat has been degraded by invading exotic shrubs and trees. Habitat destruction continues to be the main threat to the survival of the taxon. At Kaena Point, the invasive nonnative koa haole is a threat to the species, and at Barbers Point sourbush and kiawe alter the habitat of the species and compete for light (USFWS 2009). Weed control is ongoing at the Kalaeloa population (Ellis 2010). Increased mortality of wild individuals has been observed due to scale farming by long-legged ants (*Anoplolepis longipes*) in the Kalaeloa Unit of the Pearl Harbor NWR (USFWS 2009). In addition, human activities, such as the deposition of trash and construction material into exclosures, are a threat to the survival of the taxon in its native habitat.

Population Trends

At the time of Federal listing in 1986, only two populations consisting of two individuals at Kaena Point State Park, and approximately 400 individuals at Barbers Point, within the Ewa Plain, were known on Oahu. From 1987 to 1991, three subpopulations were discovered at Kaena Point consisting of 71 individuals at all life stages. There were four subpopulations on the Ewa Plains reported from 1985 to 1991 containing approximately 1,387 individuals. The biggest subpopulation was fenced and in 1990 and three plant sanctuaries were created to protect plants in situ (on-site). One of the plants sanctuaries was a newly reintroduced population from nursery stock (USFWS 2009).

In 1996, two populations were known to occur at the Barbers Point area of the 'Ewa Plains (4,270 individuals), and Kaena Point, Oahu (48 individuals) (USFWS 1996). In 2004, a second subpopulation at Barbers Point (C. Brewer Plant Sanctuary) consisted of 150 mature and 150 immature plants, and two other fenced exclosures (Alternative Tech Park) consisting of 62 mature and 200 immature individuals (Kane 2004). However, additionally in 2004, a decline in the number of extant individuals was reported, with a loss of 224 individuals in a subpopulation at Barber's Point (Lighthouse Plant Sanctuary) (USFWS 2009).

In 2007, estimates of the number of wild and reintroduced individuals ranged from four subpopulations found in Kaena, Makaha, Campbell Industrial Park, and the Kalaeloa Unit of the O'ahu NWR Complex to six subpopulations on other sites on O'ahu consisting of about 1,000 individuals (USFWS 2009). A population of 600 to 700 mature individuals was discovered in 2004 on the ridge between Makaha and Waianae Kai (USFWS 2009). In 2006, the Barbers Point (Kaomi Loop/Campbell Industrial Park) subpopulation was reported to consist of four mature individuals, four immature individuals and one seedling (USFWS 2009). Currently, the largest native remnant stand occurs at the Kalaeloa Unit of the O'ahu NWR Complex. Figure 4 depicts the distribution of documented populations of round-leaved chaff flower within O'ahu.

The overall population trend for this species has shown an increase since its 1986 listing (USFWS 2009). Recent restoration efforts have greatly augmented the number of extant individuals on O'ahu. At the Kalaeloa Unit, over 100 individuals have been reintroduced and natural recruitment is occurring; however, actual counts are not currently available (USFWS 2009; Ellis 2011a).

Round-leaved Chaff Flower Habitat Conservation Plan

Project Impact

As currently designed, the entire 0.75 acre site will be developed as a 62-unit self storage facility. A conceptual development plan of the site is presented in Appendix A. The proposed construction and operation of the facility would result in direct incidental take of two round-leaved chaff flower (federally and state listed endangered) individuals (Figure 2). These impacts would be mitigated through implementation of compensation measures presented below.

Cumulative Impacts

Current projects and reasonably foreseeable future projects may potentially have cumulative impacts on round-leaved chaff flower. The proposed project, however, proposes mitigation measures that would provide a contribution to the overall success of this species, thus cumulative impacts would not be significant.

Mitigation Measures

Per Chapter 195D (Section 21) of the HRS the HCP shall:

“Identify the steps that will be taken to minimize and mitigate all negative impacts, including without limitation the impact of any authorized incidental take, with consideration of the full range of the species on the island so that cumulative impacts associated with the take can be adequately assessed; and the funding that will be available to implement those steps.”

Mitigation strategies have been developed within this HCP to minimize and mitigate negative impacts to round-leaved chaff flower as a result of the KIP project and to provide a net recovery benefit for the species. A summary of proposed mitigation measures are presented below. A detailed Mitigation Monitoring Plan (MMP) is provided in Appendix D. Mitigation activities are proposed to commence within 30 days of obtaining an Incidental Take License (ITL).

Mitigation Strategy

In order to offset impacts to round-leaved chaff flower from the development of the KIP project, CLDC proposes to conduct in-kind off-site mitigation in the form of habitat restoration and creation. The proposed off-site mitigation site is located on preserved lands of the Pearl Harbor NWR’s Kalaeloa Unit located approximately 2 miles from the project site (Figure 1 and Figure 5). A description of this site is provided below in Section 3.2.2.

CLDC has coordinated efforts with NWR staff to receive approval for use of the Kalaeloa Unit as a mitigation site. Accordingly, a proposal was submitted to Mr. David Ellis, Project Leader, of the O'ahu NWR on 31 January 2011 that detailed proposed mitigation efforts. A letter providing general support from the NWR to use the Kalaeloa Unit as a mitigation site is provided in Appendix E; final concurrence will depend on approval of the final HCP. Outplanting site selection would be determined by the Refuge Manager based on site conditions at the time of planting. First and foremost, suitable sites shall be chosen that do not currently support existing round-leaved chaff flower populations so that outplanted individuals associated with this project are kept separate for monitoring purposes. All work on the NWR would be conducted under a Refuge Special Use Permit and subject to General and Special Conditions of that permit, as well as conditions of this of this HCP.

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Pearl Harbor NWR is part of the O'ahu NWR Complex which is comprised of three units located within a highly developed and degraded landscape along the southern shore of O'ahu: the Waiawa Unit (24.5 acres), the Honouliuli Unit (36.5 acres), and the Kalaeloa Unit (37.4 acres) (Figure 1).

The newest unit, Kalaeloa (or Unit) (Figures 1 and 5), is located on the flat coastal 'Ewa Plain approximately 7 miles southwest of Pearl Harbor. This Unit was formerly part of the Barber's Point Naval Air Station (NAS) and is a unique example of the dry coastal shrubland habitat that once extended along most of the 'Ewa plain. The small remnant populations of endangered plants including round-leaved chaff flower, as well as other rare native flora, such as an endemic subspecies of naio (*Myoporum sandwicense* ssp. *stellatum*) found only at this site, are clear indicators of the critical importance of this managed and protected refuge unit to these endangered species. The Kalaeloa Unit was established during Barber Point NAS base closure proceedings in 2001 to protect and enhance the habitat for the endangered coastal dryland plants, round-leaved chaff flower and 'Ewa Plains 'akoko (*Chamaesyce skottsbergii* var. *skottsbergii*).

The rare coastal coralline environment that occurs on the Kalaeloa Unit is a small remnant of this unique habitat that once occurred across much of the 'Ewa Plain along the south shore of O'ahu. This natural plant community has almost been lost due to urban, industrial, and agricultural development and severe invasion by many pest species of plants and animals. Dominant pest plants (e.g., kiawe, koa haole, and others) have been greatly reduced on much of the Unit but where they still occur their presence can result in poor or inadequate germination and survival conditions for many sensitive or endangered native plants (USFWS 2010). Restoring and protecting this habitat is vital to maintaining the biological integrity of the NWR. The Kalaeloa Unit also provides a critical site where the genetic integrity of endangered plants can be maintained and where seed reserves can be harvested for future propagation and restoration (USFWS 2010).

Currently approximately 25 acres of the 37.4 acre Kalaeloa Unit are under active management within designated "Work Units" (Figure 6). Management will be undertaken on the remaining 7 acres (Work Unit 6) to include removal of mature kiawe trees, removal and control of other invasive species, and initiate restoration through natural regeneration and outplanting of native plants (Figure 6). Also, identification and restoration of additional anchialine pools will take place across the entire Unit (USFWS 2010). The Kalaeloa Unit is generally closed to general public access in order to minimize human disturbance.

The most recent round-leaved chaff flower restoration project on the Kalaeloa Unit included outplanting approximately 300 plants (4-inch) (within Work Unit 5; Figure 6) in January and February 2011 using volunteer labor. A slow release commercial fertilizer was used during installation and weekly watering was conducted by volunteers through March and reduced to every other week thereafter; watering commenced in mid-May. Plant growth was observed to be extremely rapid and flowers were observed on all surviving plants (most 12-16 inches tall) by late May. Exact counts are currently not available but estimated survival is at about 290 plants. Hand weeding was done around most plants through this period (Ellis 2011b).

The Pearl Harbor National Wildlife Refuge Comprehensive Conservation Plan (CCP) (USFWS 2010) includes goals and objectives for the management and conservation of habitats and species located within the Kalaeloa Unit (Table 1). The proposed mitigation efforts presented in this HCP are consistent with Goal 2 and Goal 4 of the CCP for the Kalaeloa Unit (USFWS 2010; Table 1). Management activities at the Kalaeloa Unit will result in long-term conservation of the transplanted and outplanted round-leaved chaff flower plants. Although the goals of this HCP are consistent with those of the CCP, the NWR is not responsible for the net recovery of the species as it relates to this HCP. CLDC is ultimately responsible for the success of mitigation efforts and a net recovery of the species as related to this project.



National Wildlife Refuge Operations and Maintenance Monitoring Plan

Goal 2: Restore and protect coastal coralline plain habitat at the Kalaeloa Unit	
Objective 2.1 Restore and manage dry coastal shrubland habitat.	Strategies Applied to Achieve Objective
<p>Manage 25 - 37 acres of dry coastal shrubland habitat characterized by the following:</p> <ul style="list-style-type: none"> • Coral limestone substrate with pockets containing sandy organic humus soil; • <20 stems per acre of woody invasive species including marsh fleabane, kiawe, and koa haole; • No mature kiawe; • <25% cover of herbaceous invasive plants (e.g., buffleggrass, khaki weed, golden crownbeard); • Patchy distribution of low growing (2-8 in), native woody species (e.g., kou, 'ilima, beach • naupaka, pilo, wiliwili, naio) as a mosaic; and • Endangered plants ('Ewa hinahina, 'akoko) distributed in appropriate microhabitat (e.g., suitable moisture-retentive soils with wind/sun protection). 	<ul style="list-style-type: none"> • Unit is closed to general public access to minimize human disturbance • Fence boundary to prevent trampling of endangered plants • Develop formal trail system for guided tours to reduce ground disturbance, protect plants, and improve visitor safety • Control pest plants and animals using Integrated Pest Management (IPM) techniques including herbicide application, mowing, rototilling, trapping, and rodenticide bait stations • Harvest seed with subsequent propagation and outplanting of endangered and native plant species
Goal 4: Provide interpretive and educational opportunities to enhance public understanding of and appreciation for the natural and cultural resources of Pearl Harbor NWR.	
Objective 4.1. Provide a quality environmental education program at the Honouliuli and Kalaeloa Units.	Strategies Applied to Achieve Objective
<p>Environmental education programs will have specific learning objectives and diverse opportunities with the following attributes:</p> <ul style="list-style-type: none"> • Meet State standards for learning; • Based on Refuge and endangered species recovery management programs; • Support the mission of the Service and the Refuge System; • 90% of programs are teacher-led; • Support the Service's "Connecting Children with Nature" program; • Seasonal program (September–December) at Honouliuli Unit provides educational visits for up to 60 third-grade students per day, for up to 5 days a week, and less than 3,500 students per year; and 	<ul style="list-style-type: none"> • A seasonal program that provides educational visits for up to 1,500 high school and college students per year at Kalaeloa Unit. • Maintain partnership for providing environmental education opportunities primarily by Leeward Community College staff at Kalaeloa on native and endangered plant restoration • Maintain partnerships for providing environmental education opportunities at Honouliuli for <3,500 students • Provide seasonal program for high school and college students at Kalaeloa for <1,500 students • Hire Environmental Education Specialist position for Complex

Source: USFWS 2010

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Proposed compensatory mitigation efforts would create new populations of round-leaved chaff flower on the Kalaeloa Unit from the genetic stock (seeds and cuttings) of the two individuals that would be impacted as a result of the KIP project. In addition, at the request of the USFWS, additional seed from a local wild source is to be included within the mitigation design in order to ensure genetic variation.

In preparation of the proposed mitigation activities, seed and cutting collection efforts were coordinated with the DLNR, Division of Forestry and Wildlife (DOFAW) horticulturalist, Greg Mansker. In December 2010, Mr. Mansker collected approximately 100 seeds from the two round-leaved chaff flower individuals located within the KIP project site. Collected seeds and cuttings are currently being stored at the Seed Conservation Laboratory at the Lyon Arboretum Tissue Culture Facility located on O'ahu. There will be no take of plants at the wild site until a sufficient amount of seed is obtained for storage and propagules are grown from the parent plants.

In addition, in order to ensure genetic diversity, additional round-leaved chaff flower seed was collected from individuals that occur within plant sanctuaries located on properties belonging to the City and County of Honolulu (Honolulu) (Figure 5). Seed collection was conducted by Mr. Rick Barboza, with approval from Honolulu, under a *State Permit for Threatened and Endangered Plant Species* (dated December 2011). A copy of this permit and a letter providing approval for collection on Honolulu lands are provided in Appendix F.

CLDC proposes to propagate round-leaved chaff flower seeds and cuttings at a Hui Ku Maoli Ola Native Plant Nursery located in Kaneohe, Hawai'i. Hui Ku Maoli Ola will incorporate the Hawaiian Rare Plant Restoration Group's (HRPRG) phytosanitation standards and guidelines at their nursery for the propagation efforts. Native plant specialists, Mr. Matt Schirman and Mr. Rick Barboza at Hui Ku Maoli Ola have conducted several round-leaved chaff flower outplanting activities for the NWR within the Kalaeloa Unit with much success. As professional horticulturists experienced in the propagation and planting of round-leaved chaff flower, Mr. Schirman and Mr. Barboza will oversee all site preparation and outplanting activities within the NWR.

Upon seed growth, CLDC proposes to outplant approximately 80 individual plants within suitable habitat located on the Kalaeloa Unit, 40 of which shall be from the KIP site seed source and 40 of which from the City/County of Honolulu plant sanctuary seed source (Figure 5). Designated planting sites would be identified by Refuge staff in conjunction with Mr. Balboza's and Mr. Schirman's recommendations within Work Unit 1 and/or 5 of the NWR (Figure 6). In addition to other considerations and site factors, planting sites would be selected that do not currently have any existing round-leaved chaff flower plants and are sufficient distance from existing plants to insure that monitoring of outplanted plants can document success or failure of mitigation activities.

In preparation of outplanting activities, CLDC will conduct habitat enhancement activities, including nonnative species removal within the planting sites, as necessary. Since the exact planting locations have not been chosen within the Kalaeloa Unit at this time, the dominance of native species within the chosen sites is currently unknown. If sites are chosen that are dominated by nonnative species, then habitat enhancement shall include planting of native species upon removal of nonnatives. However, if a site is chosen that is dominated by native species, then planting will not be necessary (although subdominant nonnatives shall be removed). Furthermore, since the baseline conditions of the chosen sites are currently unknown, details regarding site preparation, irrigation, water sources etc. are not provided herein. CLDC proposes to prepare and submit a Planting Plan once site selection has been determined. The Planting Plan shall provide photographs and maps of planting locations and shall provide details regarding baseline conditions, site preparation, planting methods, nonnative weed removal, and proposed pest control methods (as necessary). The Planting Plan shall be prepared in consultation with the project horticulturist and USFWS Refuge staff that have successfully conducted and are currently conducting round-leaved chaff flower outplanting activities within the Kalaeloa Unit. The Planting Plan shall be submitted to DOFAW within 30 days of issuance of the ITL for approval prior to mitigation activities.

CLDC additionally proposes to utilize educational institutions to implement habitat restoration and enhancement activities within the round-leaved chaff flower planting sites. Educational native plant restoration programs such as the Plant Bioscience Technology Program at Leeward Community College and the Wai'anae High School Hawaiian Studies Program led by Dr. Bruce Keobebe are proposed to help with planting and habitat enhancement activities in order to provide hands-on opportunities for students to learn history and science blended with environmental stewardship. All activities shall be overseen by the project horticulturist (Mr. Matt Schirman) and conducted in coordination with the USFWS Refuge staff per conditions of the Special Use Permit and this HCP. The utilization of such institutions would additionally support Goal 4, Objective 4.1 for the Kalaeloa Unit (Table 1) as described in the Pearl Harbor NWR CCP.

Successful implementation of these mitigation efforts would significantly increase the numbers of new plants on O'ahu as well as improve their quality compared to the in situ disturbed location of the KIP site. These mitigation efforts would also protect the genetic diversity of the existing population and protect existing individuals by relocating them to appropriate habitat within preserved lands, as well as provide education stewardship opportunities within the NWR.

Implementation

The mitigation program is proposed for 5-years Appendix G presents the proposed HCP implementation schedule. Section 4.5 provides a detailed schedule for outplanting and monitoring activities. All restoration, maintenance, monitoring and seed storage efforts will be funded by CLDC within this time period (refer to Section 3.3.2 Financial Assurances).

Financial Assurance

CLDC will fund all monitoring and mitigation activities. Appendix H provides an estimated budget for anticipated costs associated with implementation of mitigation and monitoring activities. CLDC shall provide the required conservation measures (e.g. mitigation and monitoring) in full, even if actual costs are greater than anticipated.

Assurances that adequate funding will be available to support the proposed monitoring and mitigation measures will be provided by CLDC in the form of a performance bond in the amount of \$72,000, naming the DLNR as the beneficiary, which will be available to fund mitigation in the unlikely event of a revenue shortfall or, in the worst case scenario, bankruptcy. The bond will be automatically renewed prior to expiration, unless it is determined to no longer be necessary by the DLNR. In the event of a revenue shortfall or bankruptcy the bond could be drawn upon by the USFWS or DLNR to fund any outstanding mitigation obligations of the project. A single bond or letter of credit for valued at \$72,000 shall be established for contingency funds. Appendix H presents the HCP funding matrix.

Consistency with the Recovery Plan

In accordance with Chapter 195D (Section 21) of the HRS the HCP shall:

“Be consistent with the goals and objectives of any approved recovery plan for any endangered species or threatened species known or reasonably expected to occur in the ecosystems, natural communities, or habitat types in the plan area.”

A USFWS draft recovery plan was developed for round-leaved chaff flower and associated species, Ewa Plains ‘akoko in 1993 (USFWS 1993); however, this plan has not yet been finalized. The ultimate objective for these taxa is to delist them, completely removing them from federal protective status. Per the draft recovery plan, in order to consider downlisting, there must be at least three self-reproducing populations with a minimum of 1,000 reproductive plants per population in each of the two geographically distinct regions in which it occurs (USFWS 1993; Figure 4).

A recent evaluation of the status of round-leaved chaff flower was conducted by the USFWS 5-Year Review Summary Evaluation in 2008 (USFWS 2009). The evaluation ultimately determined that it is not possible to determine if the delisting goals for this species have been met, as the number of mature individuals is not currently known and the recovery plan has not been finalized, due to taxonomic issues with the other species in the plan. Furthermore the evaluation states that not all of the threats are being managed. Therefore, the evaluation determined that round-leaved chaff flower meets the definition of endangered as it remains in danger of extinction throughout its range. The 5-Year evaluation presented the following recommendations for recovery of this species:

- Continue collection of fruit and plant material for future reintroductions, especially from the recently discovered population at Waianae Kai/Makaha;
- Eradicate invasive introduced plant species within the species’ habitat;

- Establish more populations within suitable habitat in protected sites;
- Survey geographical and historical range for a thorough current assessment of the species;
- Determine and implement control methods for scales and ants in the populations;
- Assess genetic variability within extant populations;
- Assess the suitability of habitat for reintroducing this species on Lanai and Molokai;
- Initiate planning and contribute to implementation of ecosystem level restoration and management to benefit this taxon;
- Study *Achyranthes splendens* var. *rotundata* populations with regard to population size and structure, geographical distribution, flowering cycles, pollination vectors, seed dispersal agents, longevity, seed banks, specific environmental requirements, limiting factors, and threats; and
- Revise draft recovery plan with current information (USFWS 2009).

This HCP is designed to enhance populations of round-leaved chaff flower in a protected and managed area. The goal of this HCP is to 1) maintain genetic representation of the original population by growing cuttings and seeds in nurseries for outplanting efforts and additionally placing seeds at Lyon Arboretum; and 2) to establish new, self sustaining wild populations within protected suitable habitat located on Pearl Harbor NWR Kalaeloa Unit in order to provide a net recovery benefit for the species.

The conservation measures presented herein are consistent with the recommendations provided in the 5-Year evaluation. These conservation measures will contribute to the overall success of this species, in support of the species recovery as identified in the draft recovery plan (USFWS 1993).



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Per Chapter 195D (Section 21) of the HRS the HCP shall:

“Contain objective, measurable goals, the achievement of which will contribute significantly to the protection, maintenance, restoration, or enhancement of the ecosystems, natural communities, or habitat types; time frames within which the goals are to be achieved; provisions for monitoring (such as field sampling techniques), including periodic monitoring by representatives of the department or the endangered species recovery committee, or both; and provisions for evaluating progress in achieving the goals quantitatively and qualitatively”; and

“Provide for an adaptive management strategy that specifies the actions to be taken periodically if the plan is not achieving its goals.”

The overall goal of this HCP is to successfully implement mitigation and minimization efforts that would offset impacts to round-leaved chaff flower as a result of the KIP development project. These efforts would increase the numbers of new plants on O’ahu by establishing a wild, self sustaining population, as well as improve their habitat quality compared to the in situ disturbed location of the KIP site. Mitigation efforts provided herein would also protect the genetic diversity of this population and protect existing individuals by relocating them to appropriate habitat within preserved lands.

In order to measure the success of these efforts, CLDC proposes to implement a monitoring a maintenance program for 5-years upon plant installation. Monitoring shall measure the success of survival, growth, reproduction, and phenology of all individual plants that have been outplanted. These efforts would additionally document and recommend remedial and adaptive management measures that would be required for project success. Maintenance and monitoring efforts will be completely funded by CLDC. A summary of this program is provided below. A detailed MMP is provided in Appendix D.

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Prior to site preparation and installation of round-leaved chaff flower individuals, the spatial extent of each planting site shall be located and demarcated with a Global Positioning System (GPS) device. Baseline conditions shall be established within this area; at a minimum, the relative abundance of native and nonnative species and soil conditions shall be collected. Photo-points will additionally be established and recorded with a GPS. Baseline conditions of the site will be photographed from a variety of perspectives at each photo-point. Following these data collection efforts, the site shall be prepared for installation by removing nonnative species and preparing the soil and topography for plant installation. These efforts will be monitored by the project horticulturalist to ensure that native species and natural resources within the NWR are not impacted during site preparation. The five-year monitoring period will commence upon

the 120-day establishment period (refer to Section 4.2.1). As noted above, a Planting Plan shall be prepared for submittal to the DLNR for approval within 30 days of the ITL issuance.

Establishment Monitoring

The establishment monitoring period will commence after the individuals of round-leaved chaff flower have been installed on the NWR. The establishment monitoring period will last for 120 days. The purpose of the 120-day establishment period is to provide an observation and guarantee period to ensure that the different components that comprise installation are operating and performing as intended. For example, flaws with the irrigation system (if implemented) or health problems with plants that were not detectable during installation are likely to be identified during the 120-day establishment period. During this period the project horticulturist will conduct weekly inspections for the first 30 days and biweekly (every two weeks) thereafter. The project horticulturist will develop a list of items that need to be addressed to meet success criteria and will oversee or implement these items in coordination with the NWR as necessary. A memorandum detailing the results of 120-day monitoring activities shall be submitted to DOFAW upon completion of this monitoring period. Successful completion of this guarantee period will verify that installation was properly performed prior to starting the monitoring and maintenance period.

Establishment Monitoring

The monitoring and maintenance period will commence after the completion of the 120-day establishment period. Upon commencement of this period, the planting sites will be monitored through a combination of qualitative and quantitative means. Qualitative or horticultural monitoring provides proactive direction and oversight of the maintenance program, while qualitative or botanical monitoring measures quantitative habitat development. Each of these methods is discussed in more detail below. Note that each individual plant shall be tagged and the locations will be demarcated by a sub-meter GPS device prior to monitoring activities.

Botanical Monitoring

The project botanist or horticulturalist will conduct horticultural monitoring within the planting sites bimonthly (twice monthly) during the first 6 months of Year 1, monthly thereafter through Year 2, and quarterly between years 3 and through 5. Each monitoring visit will include a qualitative assessment of the mitigation areas and identification of maintenance needs. Horticultural monitoring visits will include a minimum of the following tasks:

- Direct counts of healthy round-leaved chaff flower plant (note each plant will be tagged and demarcated by a GPS device upon installation)
- Mortality counts of round-leaved chaff flower plants
- Plant vigor -healthy, moderate, and dead (based on developed criteria)
- Phenological stage counts- number of vegetative, reproductive, or dead
- A general description of the status of the plantings

- Plant damage- from rodents or insects etc.
- Threats
- A list of maintenance requirements
- Visual assessment and photographic documentation of native and nonnative percent cover
- Visual assessment and chemical analysis of soil conditions

A written memorandum will be prepared after each horticultural monitoring visit, listing problems (if observed) and recommending remedial measures. These memoranda will be sent to the maintenance personnel (contracted by CLDC) or suitable alternate for implementation. The project horticulturalist will be responsible for dead plant counts and for recommending remedial measures needed to improve the mitigation areas and species growth if they are not meeting the desired growth success criteria. The horticulturalist will prepare a letter report subsequent to all horticultural monitoring assessments to track the progress of the mitigation areas. All reports will address the presence of nonnative species and will identify corrective measures for weed control. A copy of each monitoring letter report will be provided by to the maintenance personnel. CLDC will also submit these reports to the DLNR. Required maintenance will be performed promptly, generally within two weeks of the receipt of the monitoring report and shall be overseen by the project horticulturist.

While remedial measures are partially defined herein, they are also left to the discretion of the horticulturalist, since it is expected that one approach will not always be the best or most cost effective for the problem at hand. Remedial measures may include some or all of the following: invasive plant control, replanting, and addition of irrigation.

Botanical Monitoring

Botanical monitoring includes the quantitative measurements of the growth and establishment of plants and assessment of the invasion of exotic species. Botanical monitoring will be conducted a qualified biologist or horticulturalist quarterly during the first monitoring year and twice per year thereafter, with monitoring visits in January and June. Sampling times will be consistent from year to year (refer to Section 4.5 for schedule). The monitoring data will be included in the annual reporting that shall be submitted to the DLNR (refer to Section 5.0).

Plant establishment will be quantitatively assessed through direct counts of round-leaved chaff flower individuals (outplanted and naturally recruited). Each individual shall be documented with a sub-meter GPS device and tagged with unique number. All propagules shall also be noted, counted and numbered in order to track their success. Photographs shall additionally be taken of each individual (refer to Section 4.2).

The overall condition of the planting sites will additional be evaluated through the use of belt transects, beginning after the first growing season. The total number and placement of transects will be determined during horticultural monitoring. Transects will be randomly located in the planting areas and will be evaluated utilizing the line intercept method for cover, separated into

total cover, native species cover and weed cover. In addition, these transects will record a visual estimate of cover and a determination of species diversity in quadrats along each transect. Density of perennial species will be assessed with quadrats along the same transect.

Transect beginning and endpoints will be recorded with a GPS device. Data collected from belt transects will be used to evaluate project performance relative to the success standards (Section 4.4). Data will be collected on vegetative composition. Volunteer establishment of native species will also be noted and measured as appropriate.

Permanent photograph viewpoints will also be established and photographs taken from the same location each year (refer to Section 4.2). In addition, photographs will be taken of each botanical transect. These photographs will be included in each annual report (refer to Section 5.0).

Botanical monitoring visits will include a minimum of the following:

- Direct count of each round-leaved chaff flower individual
- An assessment of natural regeneration and propagule count
- A list of plant species found within the planting areas
- A list of wildlife species noted within the planting areas
- Data analysis from vegetation transects
- Site photography from photograph photo points
- List of maintenance requirements

In addition, any significant issue or contingency that arises within the mitigation site (e.g., plant survival issues, fire, or flooding) will be reported by CLDC in writing to the DLNR within two weeks of the date of the incident. Accompanying the report will be CLDC's proposed plan for remediation with an implementation and monitoring schedule.

Photographic Documentation

The mitigation efforts will be documented using photographic monitoring. The purpose of photographic monitoring is to provide CLDC and DLNR with a clear understanding of the restoration efforts and success. Permanent photo viewpoints will be established prior to plant installation to document baseline conditions of the mitigation area (refer to Section 4.1.1). Photos will be taken from the same location each year and will be taken from variety of perspectives at each point to create a clear picture of the effort. Video shall additionally be captured of the planting areas. Color print photographs shall be taken of the following activities:

- Pre-existing conditions prior to any restoration actions occurring at sites representing the habitat within the planting areas;
- Installation activities;

- Photographs of each of the 80 planted individuals (identified by given number)
- Representative photographs of healthy, dead, reproducing, and naturally recruited individuals;
- Maintenance and monitoring of the mitigation area; and
- Any other activities deemed to be significant in the restoration and enhancement efforts.

Success Criteria

The goal of the success standards is to ensure that the outplanted populations of round-leaved chaff flower become established and are stable and viable self-producing populations. Success criteria include the metrics of native plant cover, nonnative species cover, recruitment, plant survivorship and density. The criteria presented below were developed based on consultation with the NWR and in accordance with the goals and objectives presented in the Pearl Harbor NWR CCP for the Kalaeloa Unit. If it is determined that these criteria are not realistic based on an evaluation of baseline conditions, CLDC shall request an amendment (refer to Section 6.4) with sound justification to the DLNR for approval. In addition, note that contingency measures, as discussed below, shall be implemented if survivorship falls below standards set forth by Year 1. Proposed measures for mitigation success shall be determined by the following:

1. Outplanted individual survivorship:
 - 60 percent of the 80 outplanted individuals shall survive by Year 1
 - 65 percent of the 80 outplanted individuals shall survive by Year 2
 - 70 percent of the 80 outplanted individuals shall survive by Year 3
 - 75 percent of the 80 outplanted individuals shall survive by Years 4 and 5
2. There must be (a) recruitment of seedlings that survive through the dry season, and (b) seed production by at least 25 percent of the outplanted lineages by Year 5;
3. The number of seedlings recruited into the mature age class must be greater than the mortality rate of existing adult plants over a five year period;
4. More than 80 reproducing adult plants shall be established by Year 5;
5. Less than 25 percent cover of herbaceous nonnative plants (e.g., buffleggrass, khaki weed, golden crownbeard) within planting sites by Year 5;
6. No mature kiawe within the planting sites over the five year period; and
7. Native species cover within the planting sites shall be greater than 25 percent by Year 5.

Contingency Measures

Should survivorship fall below standards set forth by Year 1 (survivorship of 60 percent of outplanted individuals), outplanting of additional individuals (from seed collected from the two individuals on KIP project site and additional seed source site [Figure 5]) would be implemented during the following rainy season in order to achieve success standards by Year 2. If it is determined that site selection is the result of plant mortality, an additional recipient site will be selected within the Kalaeloa Unit for replanting and monitoring efforts. As the NWR is in support of mitigation efforts on their land for only a five year duration, if overall success is not met by Year 5, CLDC would identify an additional recipient site for mitigation efforts or propose additional compensation measures that are sufficient to achieve a net benefit for the species. Currently, CLDC is requesting permission from the Hawaii Community Development Authority and the newly formed private non-profit Kalaeloa Heritage and Legacy Foundation to use Kalaeloa Heritage Park (which provides suitable habitat for the species), as a back-up compensatory mitigation site, in the event that mitigation success is not met on the NWR. Kalaeloa Heritage Park was previously part of Barber's Point Naval Station (Figure 1); the 77 acre parcel is now being restored as a heritage park, to serve as a community benefit and a venue to educate both residents of Kapolei and visitors about Hawai'iian cultural heritage. All contingency measures would be submitted to the DLNR for approval prior to implementation.

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Maintenance activities will be performed to ensure overall outplanting success. These efforts may include weed control, pest control (e.g. ants), erosion control, irrigation, soil fertility management, and dead plant replacement, as needed. Depending on the nature of maintenance activities that will be necessary, maintenance personnel that will be contracted may be a qualified landscape contractor and/or volunteer groups. The project horticulturist, which will be retained for the duration of the HCP, shall oversee and supervise the maintenance program and work directly with maintenance personnel to ensure project success.

Once the plant installation has been completed, follow-up maintenance will occur as necessary for five years for all KIP project round-leaved chaff flower populations located within the NWR. Maintenance would be performed by qualified personnel with experience in maintaining native habitat revegetation in Hawai'i and shall be coordinated with the NWR. Maintenance would be conducted on a monthly basis during Year 1, bimonthly during Year 2, and on a quarterly basis during years 3 through 5. Maintenance activities may need to occur more or less frequently if recommended by the project horticulturist. Generally, a 2-foot radius void of vegetation around each individual plant shall be maintained in order to reduce competition, promote growth and encourage regeneration (Ellis 2011).

Ongoing NWR management activities at the Kalaeloa Unit include removal of invasive nonnative plant species and planting of native and endangered plant species, with an emphasis placed on the recovery of round-leaved chaff flower (USFWS 2010). All invasive plant control methods within the planting areas will be coordinated with the NWR and shall be conducted in compliance with the NWR's Integrated Pest Management (IPM) Plan. Nonnative removal techniques will be implemented per the NWR accepted methods, in accordance with the Pearl



Harbor NWR CCP and Best Management Practices (BMPs) in order to avoid adverse impacts to biological resources that are known to occur within the Kalaeloa Unit. Fire management activities on the NWR are conducted per an established Fire Management Plan. CLDC does not have the authority, responsibility or capability to conduct these activities on a NWR; however, the proposed (2-foot) buffer area around each plant that shall be kept void of vegetation shall provide minor incidental protection.

Monitoring and Maintenance Schedule

The monitoring and maintenance period will be for a period of five years, after plant installation is complete. The mitigation area will be monitored for success through a combination of horticultural and botanical means, as discussed above. Maintenance visits will be made as needed, based on the results of horticultural monitoring visits. A 5-year monitoring and maintenance schedule is provided in Table 2.

Once success standards have been met upon the 5-Year monitoring period (with DLNR concurrence), a no-net-loss of round-leaved chaff flower will be achieved. Only areas failing to meet success standards will require additional remedial measures. If success criteria are not met by Year 5, then additional mitigation measures shall be agreed upon by CLDC and the DLNR for compensation (refer to Section 4.3).

**Table 2
 Monitoring and Maintenance Schedule**

Monitoring Area	Monitoring											
	Installation	Establishment	Annual	Quarterly	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
2013- Year 0	I	EPM	EPM	EPM	EPM LR	H (x2) LR	H LR					
2014-Year 1	H LR B	H LR	H LR	H LR B	H LR	H LR B	H LR	H LR AR-1	H LR	H LR B	H LR	H LR
2015 -Year 2	H LR B	H LR	H LR	H LR	H LR	H LR B	H LR	H LR AR-2	H LR	H LR	H LR	
2016 - Year 3	B	H LR		H LR		B		AR-3	H LR		H LR	
2017 - Year 4	B	H LR		H LR		B		AR-4	H LR		H LR	
2018 - Year 5	H LR B			H LR		H LR B		FR-5				

Notes: I = Completion of Installation; EPM= Establishment Period; LR = Letter Report; H = Horticultural Monitoring; B = Botanical Monitoring; AR -= Annual Report; FR = Final Mitigation Completion Report

An annual report process is required by Chapter 195D-21 (f) of the HRS which states that:

“Participants in a habitat conservation plan shall submit an annual report to the department within ninety days of each fiscal year ending June 30, that includes a description of activities and accomplishments, analysis of the problems and issues encountered in meeting or failing to meet the objectives set forth in the habitat conservation plan, areas needing technical advice, status of funding, and plans and management objectives for the next fiscal year, including any proposed modifications thereto.”

Annual monitoring reports will be submitted each year for five years (by 30 August of each year), beginning approximately one year after installation (Table 2). Reports will detail project progress and remedial measures recommended and implemented during the reporting period. Reports will include a summary and analysis of the abiotic and biotic monitoring data collected and an evaluation of project progress relative to success standards. Copies of the yearly monitoring reports will be submitted to the appropriate agencies (i.e., NWR staff and DLNR).

The annual reports will contain a minimum of following information:

- List of names, titles, and companies of persons who participated in monitoring and maintenance activities for that year
- Analysis with discussion of the quantitative and qualitative monitoring data, prepared in graph and table format
- Prints or color photocopies of monitoring photographs
- Maps identifying monitoring areas, transects, planting zones, etc. as appropriate

In addition to annual reporting, letter reports will be prepared after each horticultural monitoring visit as described in Section 4.1.2.1 for the duration of the monitoring period. The letter reports will briefly describe the status mitigation efforts. The letter reports will describe plant vigor, presence of native and nonnative species, irrigation performance, plant survival, natural recruitment, seed production and maintenance activities and any recommended remedial measures.

Minor Amendments

Minor Amendments are changes to the HCP provided for under the operating conservation program, including adaptive management changes as noted above. They also include revisions, which do not significantly modify the scope, or nature of activities or actions covered by the incidental take permits in terms of their affect on the Covered Species. Minor amendments may include, but are not limited to, the following:

- Minor changes to seed collection protocols (i.e. if additional seed is needed for collection).
- Minor changes to plant installation protocols.
- Minor changes to planting location within the NWR lands.
- Minor changes to monitoring or reporting protocols.
- Minor changes to maintenance protocols in order to further minimize or avoid take of the species.
- Any other modifications that are consistent with the goals and objectives described in this HCP that will not result in operations under the HCP that are significantly different from those analyzed in connection with the HCP as approved.

CLDC may submit a proposed minor revision to the DLNR for review. The DLNR shall each respond in writing to the proposal within sixty (60) calendar days of receipt of the request, or the request will be deemed to have been approved. The responses shall either (1) concur in the proposed revision; (2) identify additional information necessary to enable the agency to evaluate the revision, or (3) disapprove the revision. If the DLNR disapproves the revision, it shall convey its disapproval in writing to CLDC, stating the reasons for the disapproval. If either the DLNR disapproves the requested revision, then the revision must be processed as a Major Amendment, as described below.

Major Amendment

A Major Amendment includes but is not limited to the following:

- Changes to the Covered Activities that were not addressed in the HCP as originally adopted, and which otherwise do not meet the criteria for a Minor Amendment as discussed above.
- Revisions to success criteria, if not achievable.
- Extending the term of the incidental take authorizations due to failed success.

A Major Amendment requires the submittal of a written application to the DLNR and implementation of all permit processing procedures applicable to an original incidental take authorization. The specific documentation required to comply with HRS Chapter 195D.



The DLNR may suspend or revoke their respective incidental take authorizations if CLDC fails to implement the HCP or the terms of the incidental take authorizations. Suspension or revocation of the permits shall be done in accordance with applicable federal or state law.

Permit Assumption

In the event of sale or transfer of ownership of the KIP property during the term of the permit, a new permit application, permit fee, and an Assumption Agreement will be submitted to the DLNR by the new owner(s). The new owner(s) will commit to all requirements regarding the take authorization and mitigation obligations of this HCP unless otherwise specified in the Assumption Agreement and agreed to in advance by the DLNR.



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CLDC looks forward to working with the DLNR throughout the approval and 5-Year implementation period of this HCP for the KIP project. CLDC is committed to making all reasonable and appropriate efforts to compensate for these impacts as evaluated and determined through the HCP process and its adaptive management strategy. As currently designed, successful implementation of the proposed compensatory mitigation measures are believed to achieve a net benefit to this species. Ultimately, impacts to the two individuals of round leaved chaff flower as a result of the proposed KIP project will be compensated by successful establishment of a viable wild population of this species within protected lands.

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10 X 10

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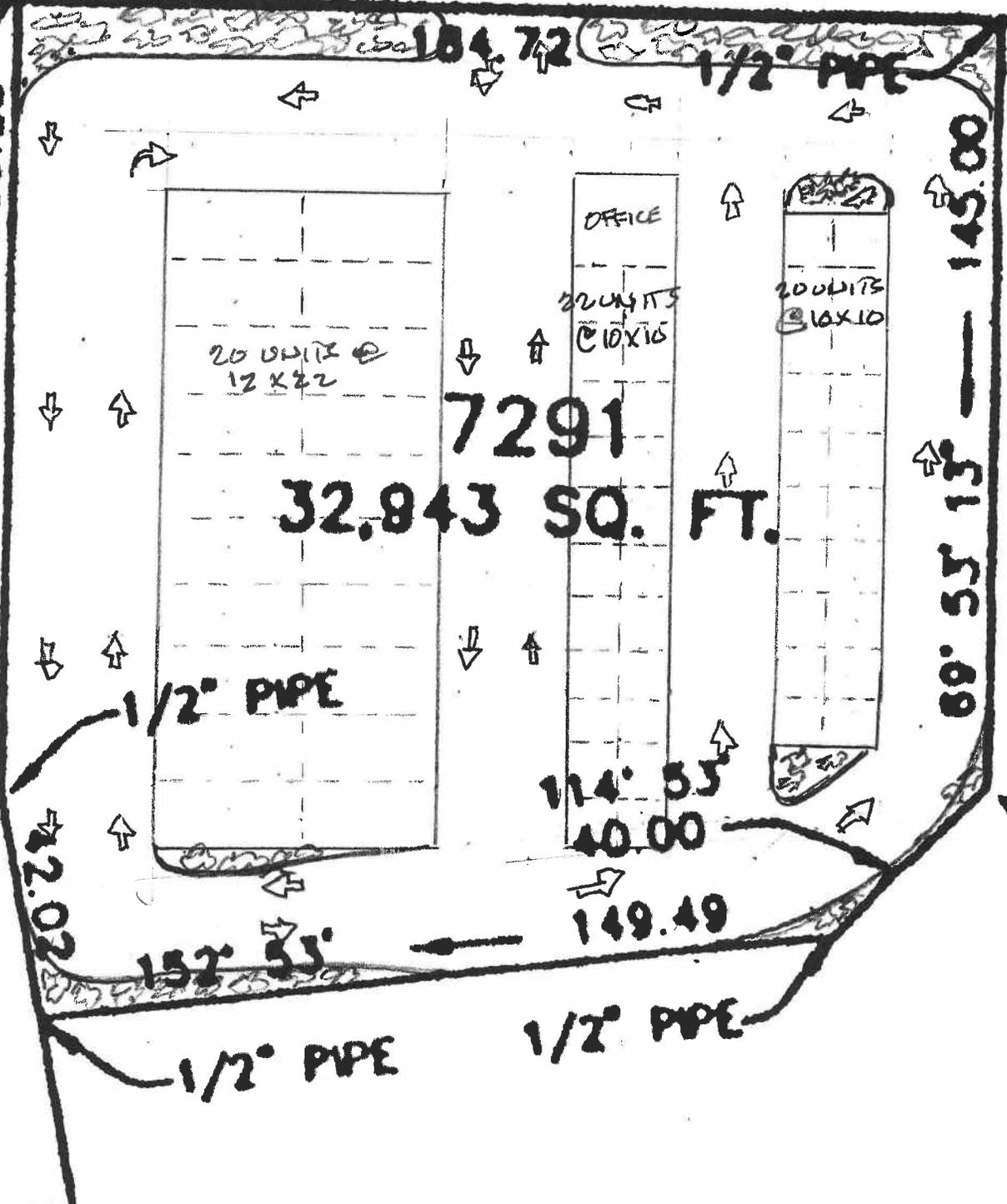
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24 June 2005

Ms. Katie Gage
CIRI
22525 "C" Street, Suite 500
P.O. Box 93330
Anchorage Alaska 99509-3330

Dear Ms. Gage,

The property along Malakole Street near the intersection with Kaihola Street was re-examined to determine the status of the *Achyranthes splendens* var. *rotundata* (formerly *Achyranthes. rotundata*) population at this location. The location had been previously examined 20 years previous to this (by W. A. Whistler in 1985) when 116 plants were found at this site. At that time, *A. splendens* var. *rotundata* was found to be the dominant understory vegetation and appeared to be reproductively active with plants in all growth stages.

I visited this site again on 23 June 2005 and made a thorough search for *A. splendens* var. *rotundata* to estimate of population size and demographics of any individuals found. The habitat at this site is still very much as it was described in the previous report. The dominant overstory canopy consists of *kiawe* (*Prosopis pallida*) on coral rock with numerous sink holes. Surrounding the trees is a raised soil that is dominated along one side by sourbush (*Pluchea symphytifolia*) and on the other sides by buffelgrass (*Cenchrus ciliaris*).

The report by Whistler indicated that individuals of *A. splendens* var. *rotundata* were growing under the kiawe canopy directly out of the coral rock substrate. Although many of the other species mentioned by Whistler in his report were still present, there was no evidence of *A. splendens* var. *rotundata* to be found. The buffelgrass and sourbush portions surrounding the kiawe thicket were also searched, and again no evidence of *A. splendens* var. *rotundata* was found.

Whister mentions that the population was actively reproductive and appeared in good health, but that the plants were "spindly" as a consequence of growing under the canopy of *kiawe* and also probably because of the poor soil conditions. The normal habitat conditions for this species is in open scrub vegetation with intermittent small trees and growing in rocky soil. It is

my opinion that this population, although reproductively active at one time, was in decline and is now extirpated from this location. My previous experiences in seeing this species is that it is usually in well draining soils along the Waianae coast, but away from the ocean or with brackish water. The associated vegetation under the *kiawe* canopy includes pickleweed (*Batis maritima*), a common indicator of brackish waters and wet, saline soils.

Given the nature of the substrate, I would not anticipate there being a seed bank upon which the population could potentially regenerate. There is no soil present in the *kiawe* understory in which the seeds could be stored. Any seeds on the surface of this substrate would be completely exposed to the elements (humidity, rain, and heat), and seeds would not persist long under these conditions.

If you have any questions regarding the visit, other species found in association with the site, or other aspects of this project, feel free to contact me.

Sincerely,

Clifford W. Morden
Botanist

Morden & Associates

Botanical and Environmental Consultants

94-333 Alula Pl.
Mililani, HI 96789
(808) 292-1369

27 February 2007

Mr. John P. Whalen, President
PlanPacific, Inc.
345 Queen Street, Suite 802
Honolulu, HI 96813

Dear Mr. Whalen,

The property along Malakole Street near the intersection with Kaiholo Street was re-examined to determine the status of the *Achyranthes splendens* var. *rotundata* (formerly *Achyranthes rotundata*) population at this location. The location had been previously examined 22 years previous to this (by W. A. Whistler in 1985) when 116 plants were found at this site. At that time, *A. splendens* var. *rotundata* was found to be the dominant understory vegetation and appeared to be reproductively active with plants in all growth stages. A more recent survey was carried out two years ago (by myself, 2005). No plants were evident during this second survey. The present survey was carried out as a follow-up to the previous report that *Achyranthes splendens* var. *rotundata* had been extirpated from this site.

The site was visited again on 14 February 2007 and a thorough search for *A. splendens* var. *rotundata* was made (Fig. 1). Although a fence had been constructed around the site to protect the plants therein, a large section of the fence along the makai side (opposite Malakole Street) has been removed. The habitat at this site is as it was described in the previous reports. In contrast to the previous visit in June 2005, the vegetation was much more lush having benefited from the recent rains of the previous several months. The dominant overstory canopy consists of kiawe (*Prosopis pallida*; Fig. 2) on coral rock with numerous sink holes (Fig. 3). Surrounding the trees is a raised soil that is dominated along one side by sourbush (*Pluchea symphytifolia*; Fig. 4) and on the other sides by buffelgrass (*Cenchrus ciliaris*; Fig. 5). Other grasses such as guineagrass (*Panicum maximum*; Fig. 6) and other alien herbs were found growing in the understory of the kiawe trees.

In contrast to the findings from two years previous, one plant of *A. splendens* var. *rotundata* was found growing directly out of the coralline rock in the middle of the understory of the kiawe thicket (Figs. 7 & 8). The plant was approximately 3 feet tall and appeared to be in a

healthy condition. The entire understory canopy was then carefully searched by walking transects at five foot intervals. No other plants (seedlings, juvenile or mature) were found.

The conclusion of my previous report was that *A. splendens* var. *rotundata* had been extirpated from this location and that no seeds would survive in a seedbank because of the coralline nature of the substrate. This conclusion was obviously in error. There are two possibilities for this plants presence. First, a seedbank may have been present and the plant has germinated and grown since then. There have been two growing seasons since the last visit, and seeds may have been present and protected in cracks or crevices of the coralline rock. Second, The previous visit was during the summer months during which time this region of Oahu can become very dry. If the plant was present then, it likely had lost its leaves and appeared as a dry stem indistinguishable from sourbush or kiawe plants of similar size. As these are relatively fast growing plants, it would likely have been much smaller if present at all.

As mentioned in the 2005 report, the normal habitat conditions for this species is in open scrub vegetation with intermittent small trees and growing in rocky soil. The conclusion that this particular population is in decline is still valid although the species has not been extirpated as of yet. Plants of *A. splendens* var. *rotundata* are not long-lived, typically living up to five years, perhaps longer under optimal growing conditions. Thus, the site should continue to be monitored on an annual basis to track the survival of this one plant and to see if additional recruitment occurs.

If you have any questions regarding the visit, other species found in association with the site, or other aspects of this project, feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'Clifford W. Morden', with a long horizontal line extending to the right.

Clifford W. Morden
Botanist

Morden & Associates

Botanical and Environmental Consultants

94-333 Alula Pl.
Mililani, HI 96789
(808) 292-1369

17 March 2008

Mr. John P. Whalen, President
PlanPacific, Inc.
345 Queen Street, Suite 802
Honolulu, HI 96813

Dear Mr. Whalen,

The property along Malakole Street near the intersection with Kaihola Street was re-examined to determine the status of the *Achyranthes splendens* var. *rotundata* (formerly *Achyranthes. rotundata*) population at this location. The location had been previously examined 22 years previous to this (by W. A. Whistler in 1985) when 116 plants were found at this site. At that time, *A. splendens* var. *rotundata* was found to be the dominant understory vegetation and appeared to be reproductively active with plants in all growth stages. A more recent survey was carried out two years ago (by myself, 2005). No plants were evident during this second survey. A third survey was made to this location on 14 February 2007 and a single, mature individual of one to two years old had re-colonized the site. No smaller plants (seedlings or juveniles) were found at that time.

The site was visited again on 8 March 2008 to check the status of the *A. splendens* var. *rotundata* plant found previously and search for additional plants. The habitat at this site is as it was described in the previous reports. The dominant overstory canopy consists of kiawe (*Prosopis pallida*) on coral rock with numerous sink holes. Surrounding the trees is a raised soil that is dominated along the northeast side by sourbush (*Pluchea symphytifolia*) and along the northwest and southwest sides by buffelgrass (*Cenchrus ciliaris*). Other grasses such as guineagrass (*Panicum maximum*) and other alien herbs were found growing in the understory of the kiawe trees. Pickleweed, *Batis maritima*, is a succulent-leaf shrub common to saline soils and brackish waters that was also common along the southeast side of the property in the understory.

The single individual previously found was still extant in the field site and had grown considerably. The main stem is approximately 1 inch in diameter and is much branched. The height of the plant is still approximately 3 feet tall, and the size of the crown has increased from last year. Diameter of the plant crown was approximately 2 feet last year, and it has increased to

approximately 4 feet by 2 feet. Leaves appear healthy and have adequate turgor (water pressure within leaf), and each branch is terminated with a long inflorescence.

The entire understory canopy was then carefully searched by walking transects at five foot intervals. Three seedlings were found, approximately 3-5 inches in height with a small (half inch) inflorescence. These are apparently from seeds of the single mature individual and were found clustered together approximately 4 feet to the north of this plant growing in accumulated leaf litter. The seedlings were wilting and are not expected to survive much longer unless their roots are able to establish in a crevice and reach ground water. Three other seedlings found 15 yards to the east of the plant that look suspiciously similar to *A. spendens* var. *rotundata*. However, these are believed to belong to a related species, *Achryanthes aspera*, an alien species also found in the vicinity. These seedlings have leaves with less pubescence, leaf attachment appears slightly different, and the apical bud of the plant looks different than do the seedlings of *A. spendens* var. *rotundata*.

Given the increase in size of the mature individual in one year period from February 2007 to February 2008, it is likely this individual is only two to three years old. An estimate of longevity would be that an established plant will survive for five years and perhaps up to 10 years under optimal conditions. The conditions at the Malakole Street site might be considered near optimal given that the plant is in a protected locality with ground water available under the coralline rock.

If you have any questions regarding the visit, other species found in association with the site, or other aspects of this project, feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'Clifford W. Morden', followed by a horizontal line extending to the right.

Clifford W. Morden
Botanist



Fig 1. View of understory with kiawe and various shrubs, grasses and herbaceous plants.



Fig. 2. Close-up of coralline rock with cracks and sinkhole.



Fig. 3. Mature *A. spendens* var. *rotundata* plant with author behind it for scale.

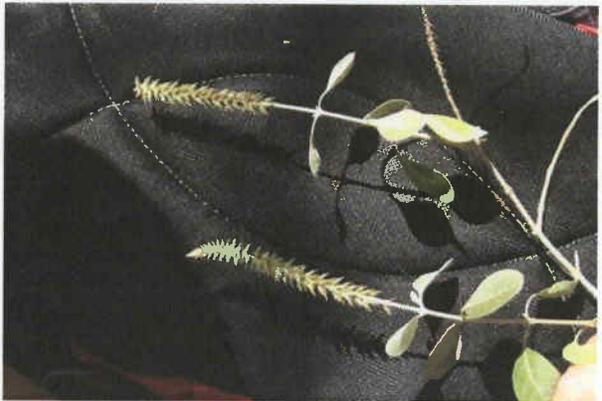


Fig 4. Inflorescences of mature *A. spendens* var. *rotundata*. Each spiny portion of inflorescence is a separate flower.



Fig. 5. Three juvenile plants of *A. spendens* var. *rotundata*



Fig. 6. Close-up of the two plants on the right in figure 5 showing wilting leaves and small inflorescence at apex.

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MITIGATION AND MONITORING PLAN

**ROUND-LEAVED CHAFF FLOWER
(*ACHYRANTHES SPLENDENS VAR. ROTUNDATA*)
HABITAT CONSERVATION PLAN
KENAI INDUSTRIAL PARK PROJECT**

Prepared for:
CIRI Land Development Company
2525 C Street, Suite 500
Anchorage, Alaska 99503
Applicant Representative: Dave Pfiefer
dpfiefer@ciri.com

Prepared by:
AMEC Earth & Environmental
3049 Ualena Street, Suite 1100
Honolulu, Hawai'i, 96819
Consultant Representative: Halleh Paymard
halleh.paymard@amec.com

February 2012

AMEC Project No.1047100002

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1.0 BACKGROUND INFORMATION

As currently designed, the entire 0.75 acre Kenai Industrial Park (KIP) Project site will be developed as a 62-unit self storage facility. The proposed construction and operation of the facility would result in direct incidental take of two round-leaved chaff flower (federally and state listed endangered) individuals. These impacts would be mitigated through implementation of compensation measures presented below. Mitigation activities are proposed to commence within 30 days of obtaining an Incidental Take License (ITL).

1.1.1 Mitigation Strategy

In order to offset impacts to round-leaved chaff flower from the development of the KIP project, CLDC proposes to conduct compensatory mitigation efforts which would create new wild populations of round-leaved chaff flower on the Kalaeloa Unit of the Pearl Harbor National Wildlife Refuge (NWR).

The new populations would be from the genetic stock (seeds and cuttings) of the two individuals that would be impacted as a result of the KIP project. Additional seed from a local wild source is also to be included within the mitigation design in order to ensure genetic variation. For further details regarding mitigation activities and seed collection refer to the Habitat Conservation Plan (HCP) which was prepared for this project (AMEC 2012).

1.1.2 Outplanting Site Selection

Outplanting site selection would be determined by the Refuge Manager based on site conditions at the time of planting. First and foremost, suitable sites shall be chosen that do not currently support existing round-leaved chaff flower populations so that outplanted individuals associated with this project are kept separate for monitoring purposes. All work on the NWR would be conducted under a Refuge Special Use Permit and subject to General and Special Conditions of that permit, as well as conditions of this of this HCP.

1.1.3 Planting Plan

Since the baseline site conditions are currently unknown, a Planting Plan shall be submitted to the DLNR within 30 days of ITL issuance for approval prior to mitigation activities. The Planting Plan shall provide photographs and maps of planting locations and shall provide details regarding baseline conditions, site preparation, planting methods, nonnative weed removal, and proposed pest control methods (as necessary). The Planting Plan shall be prepared in consultation with the project horticulturist and NWR staff that have successfully conducted and are currently conducting round-leaved chaff flower outplanting activities within the Kalaeloa Unit.

2.0 MONITORING AND MAINTENANCE PROGRAM

The overall goal of the HCP is to successfully implement mitigation and minimization efforts that would offset impacts to round-leaved chaff flower as a result of the KIP development project. These efforts would increase the numbers of new plants on O'ahu by establishing a wild, self sustaining population, as well as improve their habitat quality compared to the in situ disturbed location of the KIP site. Mitigation efforts provided herein would also protect the genetic diversity of this population and protect existing individuals by relocating them to appropriate habitat within preserved lands.

In order to measure the success of these efforts, CLDC proposes to implement a monitoring a maintenance program for 5-years upon plant installation. Monitoring shall measure the success of survival, growth, reproduction, and phenology of all individual plants that have been outplanted. These efforts would additionally document and recommend remedial and adaptive management measures that would be required for project success. Maintenance and monitoring efforts will be completely funded by CLDC. Details regarding this program are provided below.

2.1 Monitoring Methods

2.1.1 Year 0 –Baseline Monitoring

Prior to site preparation and installation of round-leaved chaff flower individuals, the spatial extent of each planting site shall be located and demarcated with a Global Positioning System (GPS) device. Baseline conditions shall be established within this area; at a minimum, the relative abundance of native and nonnative species and soil conditions shall be collected. Photo-points will additionally be established and recorded with a GPS. Baseline conditions of the site will be photographed from a variety of perspectives at each photo-point.

Following these data collection efforts, the site shall be prepared for installation by removing nonnative species and preparing the soil and topography for plant installation. These efforts will be monitored by the project horticulturalist to ensure that native species and natural resources within the NWR are not impacted during site preparation. As noted above, a Planting Plan shall be prepared for submittal to the DLNR for approval within 30 days of the ITL issuance.

2.1.1.1 120-Day Establishment Period

The establishment monitoring period will commence after the individuals of round-leaved chaff flower have been installed on the NWR. The establishment monitoring period will last for 120 days. The purpose of the 120-day establishment period is to provide an observation and guarantee period to ensure that the different components that comprise installation are operating and performing as intended. For example, flaws with the irrigation system (if implemented) or health problems with plants that were not detectable during installation are likely to be identified during the 120-day establishment period. During this period the project

horticulturist will conduct weekly inspections for the first 30 days and biweekly (every two weeks) thereafter. The project horticulturist will develop a list of items that need to be addressed to meet success criteria and will oversee or implement these items in coordination with the NWR as necessary. A memorandum detailing the results of 120-day monitoring activities shall be submitted to DOFAW upon completion of this monitoring period. Successful completion of this guarantee period will verify that installation was properly performed prior to starting the monitoring and maintenance period.

The five-year monitoring period will commence upon the 120-day establishment period. In preparation of monitoring activities, all outplanted individuals of round-leaved chaff flower shall be numbered and tagged during this period. In addition, each individual shall be mapped using a sub-meter GPS device.

2.1.2 Year 1 through 5 Monitoring

The monitoring and maintenance period will commence after the completion of the 120-day establishment period. Upon commencement of this period, the planting sites will be monitored through a combination of qualitative and quantitative means. Qualitative or horticultural monitoring provides proactive direction and oversight of the maintenance program, while qualitative or botanical monitoring measures quantitative habitat development. Each of these methods is discussed in more detail below. As discussed above, each individual plant shall be tagged and the locations will be demarcated by a sub-meter GPS device prior to monitoring activities.

2.1.2.1 Horticultural Monitoring

The project botanist or horticulturalist will conduct horticultural monitoring within the planting sites bimonthly (twice monthly) during the first 6 months of Year 1, monthly thereafter through Year 2, and quarterly between years 3 and through 5. Each monitoring visit will include a qualitative assessment of the mitigation areas and identification of maintenance needs. Horticultural monitoring visits will include a minimum of the following tasks:

- Direct counts of healthy round-leaved chaff flower plant (note each plant will be tagged and demarcated by a GPS device upon installation)
- Mortality counts of round-leaved chaff flower plants
- Plant vigor -healthy, moderate, and dead (based on developed criteria)
- Phenological stage counts- number of vegetative, reproductive, or dead
- A general description of the status of the plantings
- Plant damage- from rodents or insects etc.
- Threats
- A list of maintenance requirements

- Visual assessment and photographic documentation of native and nonnative percent cover
- Visual assessment and chemical analysis of soil conditions

A written memorandum will be prepared after each horticultural monitoring visit, listing problems (if observed) and recommending remedial measures. These memoranda will be sent to the maintenance personnel (contracted by CLDC) or suitable alternate for implementation. The project horticulturalist will be responsible for dead plant counts and for recommending remedial measures needed to improve the mitigation areas and species growth if they are not meeting the desired growth success criteria. The horticulturalist will prepare a letter report subsequent to all horticultural monitoring assessments to track the progress of the mitigation areas. All reports will address the presence of nonnative species and will identify corrective measures for weed control. A copy of each monitoring letter report will be provided by to the maintenance personnel. CLDC will also submit these reports to the DLNR. Required maintenance will be performed promptly, generally within two weeks of the receipt of the monitoring report and shall be overseen by the project horticulturist.

While remedial measures are partially defined herein, they are also left to the discretion of the horticulturalist, since it is expected that one approach will not always be the best or most cost effective for the problem at hand. Remedial measures may include some or all of the following: invasive plant control, replanting, and addition of irrigation.

2.1.2.2 Botanical Monitoring

Botanical monitoring includes the quantitative measurements of the growth and establishment of plants and assessment of the invasion of exotic species. Botanical monitoring will be conducted a qualified biologist or horticulturalist quarterly during the first monitoring year and twice per year thereafter, with monitoring visits in January and June. Sampling times will be consistent from year to year (refer to Section 2.5 for schedule). The monitoring data will be included in the annual reporting that shall be submitted to the DLNR (refer to Section 2.6).

Plant establishment will be quantitatively assessed through direct counts of round-leaved chaff flower individuals (outplanted and naturally recruited). Each individual shall be documented with a sub-meter GPS device and tagged with unique number. All propagules shall also be noted, counted and numbered in order to track their success. Photographs shall additionally be taken of each individual (refer to Section 2.2).

The overall condition of the planting sites will additional be evaluated through the use of belt transects, beginning after the first growing season. The total number and placement of transects will be determined during horticultural monitoring. Transects will be randomly located in the planting areas and will be evaluated utilizing the line intercept method for cover, separated into total cover, native species cover and weed cover. In addition, these transects will record a visual estimate of cover and a determination of species diversity in quadrats along each transect. Density of perennial species will be assessed with quadrats along the same transect.

Transect beginning and endpoints will be recorded with a GPS device. Data collected from belt transects will be used to evaluate project performance relative to the success standards (Section 2.3). Data will be collected on vegetative composition. Volunteer establishment of native species will also be noted and measured as appropriate.

Permanent photograph viewpoints will also be established and photographs taken from the same location each year (refer to Section 2.2). In addition, photographs will be taken of each botanical transect. These photographs will be included in each annual report (refer to Section 2.6).

Botanical monitoring visits will include a minimum of the following:

- Direct count of each round-leaved chaff flower individual
- An assessment of natural regeneration and propagule count
- A list of plant species found within the planting areas
- A list of wildlife species noted within the planting areas
- Data analysis from vegetation transects
- Site photography from photograph photo points
- List of maintenance requirements

In addition, any significant issue or contingency that arises within the mitigation site (e.g., plant survival issues, fire, or flooding) will be reported by CLDC in writing to the DLNR within two weeks of the date of the incident. Accompanying the report will be CLDC's proposed plan for remediation with an implementation and monitoring schedule.

2.2 Photographic Documentation

The mitigation efforts will be documented using photographic monitoring. The purpose of photographic monitoring is to provide CLDC and DLNR with a clear understanding of the restoration efforts and success. Permanent photo viewpoints will be established prior to plant installation to document baseline conditions of the mitigation area (refer to Section 2.2). Photos will be taken from the same location each year and will be taken from variety of perspectives at each point to create a clear picture of the effort. Video shall additionally be captured of the planting areas. Color print photographs shall be taken of the following activities:

- Pre-existing conditions prior to any restoration actions occurring at sites representing the habitat within the planting areas;
- Installation activities;
- Photographs of each of the 80 planted individuals (identified by given number)
- Representative photographs of healthy, dead, reproducing, and naturally recruited individuals;

- Maintenance and monitoring of the mitigation area; and
- Any other activities deemed to be significant in the restoration and enhancement efforts.

2.3 Success Standards

The goal of the success standards is to ensure that the outplanted populations of round-leaved chaff flower become established and are stable and viable self-producing populations. Success criteria include the metrics of native plant cover, nonnative species cover, recruitment, plant survivorship and density. The criteria presented below were developed based on consultation with the NWR and in accordance with the goals and objectives presented in the Pearl Harbor NWR CCP for the Kalaeloa Unit. If it is determined that these criteria are not realistic based on an evaluation of baseline conditions, CLDC shall request a variance with sound justification to the DLNR for approval. In addition, note that contingency measures, as discussed in Section 2.3.1 below, shall be implemented if survivorship falls below standards set forth by Year 1. Proposed measures for mitigation success shall be determined by the following:

1. Outplanted individual survivorship:
 - 60 percent of the 80 outplanted individuals shall survive by Year 1
 - 65 percent of the 80 outplanted individuals shall survive by Year 2
 - 70 percent of the 80 outplanted individuals shall survive by Year 3
 - 75 percent of the 80 outplanted individuals shall survive by Years 4 and 5
2. There must be (a) recruitment of seedlings that survive through the dry season, and (b) seed production by at least 25 percent of the outplanted lineages by Year 5;
3. The number of seedlings recruited into the mature age class must be greater than the mortality rate of existing adult plants over a five year period;
4. More than 80 reproducing adult plants shall be established by Year 5;
5. Less than 25 percent cover of herbaceous nonnative plants (e.g., buffleggrass, khaki weed, golden crownbeard) within planting sites by Year 5;
6. No mature kiawe within the planting sites over the five year period; and
7. Native species cover within the planting sites shall be greater than 25 percent by Year 5.

2.4 Contingency Measures

Should survivorship fall below standards set forth by Year 1 (survivorship of 60 percent of outplanted individuals), outplanting of additional individuals (from seed collected from the two individuals on KIP project site and additional seed source site [Figure 5]) would be implemented during the following rainy season in order to achieve success standards by Year 2. If it is determined that site selection is the result of plant mortality, an additional recipient site will be selected within the Kalaeloa Unit for replanting and monitoring efforts. As the NWR is in support of mitigation efforts on their land for only a five year duration, if overall success is not met by

Year 5, CLDC would identify an additional recipient site for mitigation efforts or propose additional compensation measures that are sufficient to achieve a net benefit for the species. Currently, CLDC is requesting permission from the Hawaii Community Development Authority and the newly formed private non-profit Kalaeloa Heritage and Legacy Foundation to use Kalaeloa Heritage Park (which provides suitable habitat for the species), as a back-up compensatory mitigation site, in the event that mitigation success is not met on the NWR. Kalaeloa Heritage Park was previously part of Barber's Point Naval Station ; the 77,000,000 square foot parcel is now being restored as a heritage park, to serve as a community benefit and a venue to educate both residents of Kapolei and visitors about Hawai'iian cultural heritage. All contingency measures would be submitted to the DLNR for approval prior to implementation.

2.5 Maintenance Methods

Maintenance activities will be performed to ensure overall outplanting success. These efforts may include weed control, pest control (e.g. ants), erosion control, irrigation, soil fertility management, and dead plant replacement, as needed. Depending on the nature of maintenance activities that will be necessary, maintenance personnel that will be contracted may be a qualified landscape contractor or volunteer groups. The project horticulturist will oversee and supervise the maintenance program and work directly with maintenance personnel to ensure project success.

Once the plant installation has been completed, follow-up maintenance will occur as necessary for five years for all KIP project round-leaved chaff flower populations located within the NWR. Maintenance would be performed by qualified personnel with experience in maintaining native habitat revegetation in Hawai'i and shall be coordinated with the NWR. Maintenance would be conducted on a monthly basis during Year 1, bimonthly during Year 2, and on a quarterly basis during years 3 through 5. Maintenance activities may need to occur more or less frequently if recommended by the project horticulturist. Generally, a 2-foot radius void of vegetation around each individual plant shall be maintained in order to reduce competition, promote growth and encourage regeneration (Ellis 2011).

Ongoing NWR management activities at the Kalaeloa Unit include removal of invasive nonnative plant species and planting of native and endangered plant species, with an emphasis placed on the recovery of round-leaved chaff flower (USFWS 2010). All invasive plant control methods within the planting areas will be coordinated with the NWR and shall be conducted in compliance with the NWR's Integrated Pest Management (IPM) Plan. Nonnative removal techniques will be implemented per the NWR accepted methods, in accordance with the Pearl Harbor NWR CCP and Best Management Practices (BMPs) in order to avoid adverse impacts to biological resources that are known to occur within the Kalaeloa Unit. Fire management activities on the NWR are conducted per an established Fire Management Plan. CLDC does not have the authority, responsibility or capability to conduct these activities on a NWR; however, the proposed (2-foot) buffer area around each plant that shall be kept void of vegetation shall provide minor incidental protection.

2.6 Maintenance and Monitoring Schedule

The monitoring and maintenance period will be for a period of five years, after plant installation is complete. The mitigation area will be monitored for success through a combination of horticultural and botanical means, as discussed above. Maintenance visits will be made as needed, based on the results of horticultural monitoring visits. A 5-year monitoring and maintenance schedule is provided in Table 1.

Once success standards have been met upon the 5-Year monitoring period (with DLNR concurrence), a no-net-loss of round-leaved chaff flower will be achieved. Only areas failing to meet success standards will require additional remedial measures. If success criteria are not met by Year 5, then additional mitigation measures shall be agreed upon by CLDC and the DLNR for compensation (refer to Section 2.3.1).

Table 1. Five-Year Maintenance and Monitoring Schedule

Monitoring Year	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2013- Year 0	I	EPM	EPM	EPM	EPM LR	H (x2) LR	H (x2) LR	H (x2) LR	H (x2) LR	H (x2) LR	H (x2) LR	H LR
2014-Year 1	H LR B	H LR	H LR	H LR B	H LR	H LR B	H LR	H LR AR-1	H LR	H LR B	H LR	H LR
2015 -Year 2	H LR B	H LR	H LR	H LR	H LR	H LR B	H LR	H LR AR-2	H LR	H LR	H LR	
2016 - Year 3	B	H LR		H LR		B		AR-3	H LR		H LR	
2017 - Year 4	B	H LR		H LR		B		AR-4	H LR		H LR	
2018 - Year 5	H LR B			H LR		H LR B		FR-5				

Notes: I = Completion of Installation; EPM= Establishment Period; LR = Letter Report; H = Horticultural Monitoring; B = Botanical Monitoring; AR -= Annual Report; FR = Final Mitigation Completion Report

2.7 Monitoring Deliverables

Annual monitoring reports will be submitted each year for five years (by 30 August of each year), beginning approximately one year after installation (refer to Table 1). Reports will detail project progress and remedial measures recommended and implemented during the reporting period. Reports will include a summary and analysis of the abiotic and biotic monitoring data collected and an evaluation of project progress relative to success standards. Copies of the yearly monitoring reports will be submitted to the appropriate agencies (i.e., NWR staff and DLNR).

The annual reports will contain a minimum of following information:

- List of names, titles, and companies of persons who participated in monitoring and maintenance activities for that year
- Analysis with discussion of the quantitative and qualitative monitoring data, prepared in graph and table format
- Prints or color photocopies of monitoring photographs
- Maps identifying monitoring areas, transects, planting zones, etc. as appropriate

In addition to annual reporting, letter reports will be prepared after each horticultural monitoring visit as described in Section 2.1.2.1 for the duration of the monitoring period. The letter reports will briefly describe the status mitigation efforts. The letter reports will describe plant vigor, presence of native and nonnative species, irrigation performance, plant survival, natural recruitment, seed production and maintenance activities and any recommended remedial measures. Table 1 below, provides a summary of deliverables associated with monitoring activities.

Table 2. Summary of Deliverables

Activity	Deliverable
Plant Installation	<ul style="list-style-type: none"> • Planting Plan - to DOFAW 30 days prior to issuance of ITL for approval. • Letter Report- upon commencement of installation.
Maintenance Activities	<ul style="list-style-type: none"> • Letter Report- (as needed) to DLNR within 10 days of maintenance activities.
Year 0 Monitoring:	<ul style="list-style-type: none"> • 120-day Establishment Period Letter Report- to DLNR within 10 days of termination of establishment period. • Bi-Monthly Horticultural Monitoring Letter Report- to DOFAW within 10 days of monitoring event.
Year 1 Monitoring	<ul style="list-style-type: none"> • Monthly Horticultural Monitoring Letter Report- to DOFAW within 10 days of monitoring event.

Activity	Deliverable
	<ul style="list-style-type: none"> • Annual Report detailing horticultural and botanical monitoring conducted during Year 1.
Year 2 Monitoring	<ul style="list-style-type: none"> • Monthly Horticultural Monitoring Letter Report- to DOFAW within 10 days of monitoring event. • Annual Report detailing horticultural and botanical monitoring conducted during Year 2.
Year 3 Monitoring	<ul style="list-style-type: none"> • Quarterly Horticultural Monitoring Letter Report- to DOFAW within 10 days of monitoring event. • Annual Report detailing horticultural and botanical monitoring conducted during Year 3.
Year 4 Monitoring	<ul style="list-style-type: none"> • Quarterly Horticultural Monitoring Letter Report- to DOFAW within 10 days of monitoring event. • Annual Report detailing horticultural and botanical monitoring conducted during Year 4.
Year 5 Monitoring	<ul style="list-style-type: none"> • Quarterly Horticultural Monitoring Letter Report- to DOFAW within 10 days of monitoring event. • Final Annual Report summarizing horticultural and botanical monitoring conducted between Year 1 through Year 5.

Round-leaved Chaff Flower Habitat Conservation Plan
Kenai Industrial Park Project
Kapolei, County of Honolulu, Hawai'i
AMEC Project No.1047100002
March 2012



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United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE

Oahu National Wildlife Refuge Complex
66-590 Kamehameha Highway, Room 2C
Haleiwa, HI, 96712

Phone: (808) 637-6330 FAX: (808) 637-3578

June 23, 2011



To: Hawaii Department of Land and Natural Resources
Endangered Species Recovery Committee

This is a letter of intent to support the proposed Round-leaved Chaff Flower, Habitat Conservation Plan submitted by CIRI Land Development Company by providing sites for the outplanting, maintenance and monitoring of approximately eighty (80) individual plants of *Achyranthes splendens* var. *rotundata*. These outplantings will occur on the Kalaeloa Unit of the Pearl Harbor National Wildlife Refuge, located on suitable dry coastal plain habitat of the former Barbers Point Naval Air Station near Kapolei.

We believe the current population of *Achyranthes* on the refuge and the status of the population of this plant as a whole, will benefit from the genetic diversity provided by these plants on this protected site.

The project and all associated work on the Refuge will be covered by a National Wildlife Refuge, Special Use Permit. The final issuance of this permit cannot be approved until we are able to review the final approved HCP to be sure that all requirements and conditions of the HCP are compatible with U.S. Fish and Wildlife Service, and National Wildlife Refuge policies and requirements.

In coordination with preparation of the draft HCP we recommend and support a five year duration for maintenance and monitoring of these plants. Although we have little specific data, based on general observations of both wild and previously outplanted *Achyranthes* on the Refuge, as well as very recent outplantings, the proposed plantings under this HCP should become well-established, mature and seed-producing during this timeframe.

Please contact me if you need additional information, discussion or clarification.

Sincerely,

David M. Ellis
Project Leader

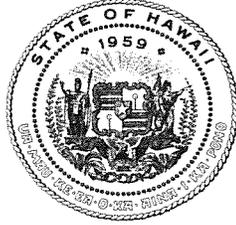


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PERMIT FOR THREATENED AND ENDANGERED PLANT SPECIES

Department of Land and Natural Resources

Division of Forestry and Wildlife

1151 Punchbowl Street, Room 325

Honolulu, Hawaii 96813

(808) 587-0165, Fax (808) 587-0160

Permit No. P-169
Date of Issue: December 15, 2011
Expiration Date: December 14, 2012

The Board of Land and Natural Resources hereby grants permission under the authority of Hawaii Administrative Rules §13-104, §13-107, and §13-124, Hawaii Revised Statutes §195D and all other applicable laws, to the person(s) listed below.

Persons in violation of the terms and conditions of this permit and /or related or appropriate laws may be subject to criminal and or administrative penalty under Hawaii Revised Statutes 195D-8, §195D-9, §195D-27, §183-4, §183-5, § 183-18, §183-21, §183C-7, §171-6.4 §171-31.6, Hawaii Administrative Rules §13-104-3, §13-107-8, or as otherwise provided by law.

Halleh Paymard – AMEC Earth & Environmental, Inc.
3049 Ualena Street, Suite 1100
Honolulu, Hawaii 96819
Phone: 619-838-4034
Email: halleh.paymard@amec.com

Richard Barboza – Hui Ku Maoli Ola
46-403 Haiku Rd.
Kaneohe, Hawaii 96744
Phone: 295-7777
Email: nativehawaiianplants@gmail.com
rick.ck.barboza@gmail.com

To collect, possess, transfer, propagate, and outplant for the purpose conservation, the following plant life:

Achyranthes splendens var. *rotundata*

Seeds and cutting from the two individuals that will be impacted as a result of the KIP project (Lot 25 on Malakole Street in Kapolei) will be collected by Rick Barboza, of Hui Ku Maoli Ola. Seeds will also be collected from individuals located in plant sanctuaries on properties belonging to the City and County of Honolulu (under the supervision of Shad Kane). These seeds and cuttings will be propagated at Hui Ku Maoli Ola's nursery in Kaneohe. Hui Ku Maoli Ola will incorporate HRPRG's phytosanitation standards and guidelines at their nursery for the propagation. Seedlings will be used to create new populations at the Kalaeloa Unit of the Pearl Harbor National Wildlife Refuge (NWR) with their approval. The exact outplanting locations will be coordinated with NWR staff based on suitable habitat. Monitoring and maintenance will be conducted by Rick Barboza for 5 years in accordance to the HRPRG guidelines. Seeds will also be stored at the Lyon' Arboretum Seed Storage Facility.

Subject to the following conditions:

I. GENERAL CONDITIONS

- A. This permit authorizes the permit holder(s) to conduct described activities at location(s) noted, on State Forest Reserves, or lands that are under the control of the control of the Division of Forestry and Wildlife (DOFAW), Department of Land and Natural Resources (DLNR).
- B. Activities conducted in DOFAW's Natural Area Reserves System (NARS) require a Special Use Permit. Activities conducted on other lands under the jurisdiction of DOFAW/DLNR, will require access permits.
- C. The permit holder(s) must obtain approval from other landowners on lands where activities are planned, including other divisions of the DLNR, private landowners, tenants, and County, State, and Federal agencies prior to conducting activities on lands under their jurisdiction.
- D. This permit is not transferable or assignable. A signed copy must be carried by permit holder(s) while engaging in activities authorized by this permit. Each permit holder is individually responsible and accountable for his or her actions under this permit.
- E. This permit does not authorize activities with any other plant species except those stated. Permission to collect additional plant material must be obtained from district DOFAW offices.
- F. Appropriate DOFAW district office must be notified in advance of proposed fieldwork, for a access permit, to coordinate collections, plant propagation needs, district requests, and approval of additional field personnel other than the listed associates for state reintroduction projects and/or their island cooperators.
- G. Primary repositories are cooperating rare plant nurseries for live storage. Lyon micropropagation laboratory (for tissue culture) and seed storage facilities (for seed storage) are secondary depositories for these propagules.

- H. This permit does not in any way make the Board of Land and Natural Resources of the State of Hawaii liable for any claims of personal injury or property damage to the permit holder(s) or his or her party which may occur while engaged in activities permitted under this permit; further, the permit holder(s) agrees to hold the State harmless against any claims of personal injury, death or property damage resulting from the activities of the permit holder(s).
- I. **This permit shall become valid upon completion of the following:**
1. **All persons who are actively involved in activities authorized by this permit have read this permit in its entirety and acknowledge understanding & agreement to abide by its conditions by signing this permit.**
 2. **The signed permit is returned to DOFAW. Upon approval by the DOFAW Administration, a copy of the signed permit will be returned to the principal investigator.**
- J. The permit holder(s) will provide copies of all publications/reports of any study resulting from the activities of this permit to DOFAW. The permit holder(s) will also provide or make available for inspection any raw data that is obtained under this permit when requested by the Division.
- K. Any person violating any of the conditions stipulated under this permit will be subject to the penalty provision provided by law. Further, any infractions of this permit may be cause for revocation of this permit and/or denial of future permit requests.
- L. This permit is issued for one year. This permit can be renewed at the end of this period. Please submit plans for the coming year and the need for permit renewal or extension before expiration of present permit.

II. SPECIAL CONDITIONS

- A. The purpose of this permit is collection, possession, propagation, transferring and outplanting of *Achyranthes splendens* var. *rotundata* for a conservation project.
- B. Propagules resulting from this permit can be accessed for conservation programs focusing on plant restoration and outplanting programs.
- C. When collecting, highest priority should be given to plants that have secure outplantings sites, are needed by district DOFAW nurseries or their cooperators, or are needed to complete genetic representation in *ex situ* collections.
- D. Collection of viable seed is the preferred propagation material, whenever possible, rather than cuttings of T&E species. The permit holder(s) will keep records of date of seed or propagule collection and estimates of the number of seeds or propagule collected. This information will be provided to DOFAW in the annual report with an inventory of green house plants resulting from present and past collection permits.
- E. Permit holder(s) is strictly prohibited from collecting whole plants unless under specific DOFAW request.
- F. **The permit holder(s) will adhere to methods that are in accordance with established procedures as published by the Hawaii Rare Plant Restoration Group (HRPRG) for collection of Threatened and Endangered species. Completion of HRPRG Rare Plant Monitoring Forms is required for all collections.**

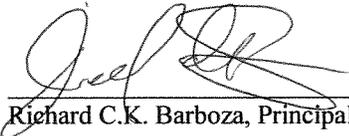
State of Hawaii
Department of Land and Natural Resources
Division of Forestry and Wildlife
1151 Punchbowl Street Room 325
Honolulu, Hawaii 96813

License No. P-169
Date of Issue: December 15, 2011
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G. Yearly reports with collection information are required and will be in electronic form. If a new population is discovered, GPS information will be supplied when possible.

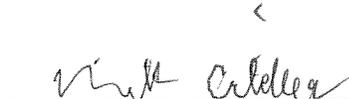
The undersigned have read, understood, and hereby agree to abide by the conditions as stated above.

Principal Investigators:

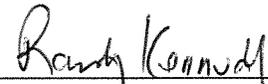

Richard C.K. Barboza, Principal Investigator

12-5-11
(Date)

Associates:


Nicholas Critcher

12-5-11

APPROVED:  Date 1/4/12
 PAUL CONRY, Administrator,
Hawaii Division of Forestry and Wildlife

Nov. 14, 2011

Halleh Paynard, Project Manager
AMEC Earth & Environmental, Inc.
3049 Ualena Street, Suite 1100
Honolulu, HI. 96707

Dear Halleh:

This letter is in response to our telephone conversation and your request to gather seeds of the *Achyranthes Splendon Rotunda* located in plant sanctuaries on property belonging to the City and County of Honolulu. The *Achyranthes Splendon Rotunda* is identified as an endangered Hawaiian plant species and afforded the protection under the Endangered Species Act and for this reason they are secured within fenced enclosures. The enforcement and management of endangered plant species are within the purview of the Department of Land and Natural Resources, Division of Forestry and Wildlife. Vickie Caraway is the State of Hawaii State Botanist and the final authority regarding the taking of seeds of endangered species plants. I serve as a volunteer curator toward the care and protection of the *Achyranthes Splendon Rotunda* on the property owned by the City. As the curator AMEC Earth & Environmental has my permission to gather seeds.

The enclosures are locked and the keys are held by both me and Henry Gabriel of the City's Department of Environmental Services at HPOWER. Please let me know of the date of the planned taking of seeds that I may assist in the unlocking of the gate and the identification of the plants to take seeds from.

Feel free to contact me either by phone at 672-4765H, 429-7175C or by email at shadskane@gmail.com for assistance.

Mahalo,
Shad S, Kane
Shad S. Kane

Cc: Vickie Caraway, State of Hawaii Botanist
Division of Forestry and Wildlife, DLNR

Round-leaved Chaff Flower Habitat Conservation Plan
Kenai Industrial Park Project
Kapolei, County of Honolulu, Hawai'i
AMEC Project No.1047100002
March 2012



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Round-leaved Chaff Flower Habitat Conservation Plan
Kenai Industrial Park Project
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AMEC Project No.1047100002
March 2012



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Funding Matrix
Round-leaved Chaff Flower Habitat Conservation Plan
Kenai Industrial Park Project
Kapolei, County of Honolulu, Hawai'i

Activity	One Time Cost	Annual Cost	Years 0-5	Contingency Funding (5-Years)
Propagation and Installation	\$20,000	-	\$20,000	-
Seed Storage	-	\$100	\$500	\$500
Site Maintenance	-	\$500	\$2,500	\$2,500
Year 0 Monitoring and Reporting	-	\$16,000	\$16,000	\$16,000
Year 1 Monitoring, and Reporting	-	\$13,000	\$13,000	\$13,000
Year 2 Monitoring and Reporting	-	\$10,000	\$10,000	\$10,000
Year 3 Monitoring and Reporting	-	\$10,000	\$10,000	\$10,000
Year 4 Monitoring and Reporting	-	\$10,000	\$10,000	\$10,000
Year 5 Monitoring and Final Reporting	-	\$10,000	\$10,000	\$10,000
Total	\$20,000	\$69,600	\$92,000	\$72,000

Round-leaved Chaff Flower Habitat Conservation Plan
Kenai Industrial Park Project
Kapolei, County of Honolulu, Hawai'i
AMEC Project No.1047100002
March 2012



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**APPLICATION FOR HABITAT CONSERVATION PLAN
AND
STATE INCIDENTAL TAKE LICENSE**

**CIRI LAND DEVELOPMENT COMPANY
KENAI INDUSTRIAL PARK PROJECT**

**Submitted to:
Department of Land and Natural Resources
Division of Forestry and Wildlife
1151 Punchbowl Street Room 325
Honolulu, Hawai'i, 96813**

**Applicant:
Cook Inlet Region, Inc. (CIRI)
2525 C St., Ste. 500
Anchorage, AK 99503**

**Applicant Representative:
David Pfeifer
(907) 263-5110
DPfeifer@ciri.com**

**Consultant:
AMEC Earth & Environmental
3049 Ualena Street, Suite 1100
Honolulu, Hawai'i, 96819**

August 2011

AMEC Project No. 1047100002

31 August 2011

Lauren E. Goodmiller
Habitat Conservation Planning Associate
Department of Land and Natural Resources
Division of Forestry and Wildlife
1151 Punchbowl Street Room 325
Honolulu, Hawai'i, 96813

Re: Application for Habitat Conservation Plan and Incidental Take License for the CIRI Land Development Company Kenai Industrial Park Project.

Dear Ms. Goodmiller:

AMEC Earth & Environmental, Inc. (AMEC) is pleased to submit this application for a Habitat Conservation Plan (HCP) and State Incidental Take Permit (ITL) on behalf of CIRI Land Development Company (CLDC) in support of the Kenai Industrial Park Project.

AMEC appreciates your assistance through this process. If you have any questions or require additional information on this application please contact me at (619) 838-4034 or halleh.paymard@amec.com.

Respectfully submitted,



Halleh Paymard
Botanist
AMEC Earth & Environmental, Inc.

Cc: Mr. David Pfeifer, CIRI Land Development Company

AMEC Earth & Environmental, Inc.
9210 Sky Park Court, Suite 200
San Diego, California
Tel: (858) 300-4300
Fax: (858) 300-4301

www.amec.com

APPLICATION INFORMATION

1. The geographic area encompassed by the plan.

The proposed Kenai Industrial Park (KIP) Project is located at Lot No. 25 Malakole Street in Kapolei, on the island of Oahu, Hawaii (Refer to Figure 1 and 2 of Attachment A).

CLDC proposes to develop the entire 0.75 acre parcel for industrial purposes similar to the land use located in the bordering parcels of the subdivision. As currently designed, the site will be developed as a 62-unit self storage facility.

Two individuals of round-leaved chaff flower (*Achyranthes splendens* var. *rotundata*), a federally listed endangered species, are located within the KIP project site. The development of the proposed KIP site is expected to result in incidental take of these individuals.

In order to offset impacts to round-leaved chaff flower from the development of the KIP project, CLDC proposes to conduct in-kind off-site mitigation in the form of habitat restoration and creation. The proposed off-site mitigation site is located on preserved lands of the Pearl Harbor National Wildlife Refuge (NWR) Kalaeloa Unit located approximately 2 miles from the project site (refer to Figure 1 and Figure 3 of Attachment A).

2. The ecosystems, natural communities, or habitat types within the plan area that are the focus of the plan.

The elevation of the KIP project site is approximately 3 feet above mean sea level (amsl). The surrounding area is approximately 3 feet higher in elevation than the project site. The project area terrain consists of karst topography with numerous eroded solution sinkholes.

The primary vegetation community within the KIP project area consists of the dry coastal shrubland community. The dominant overstory species within the site consists of nonnative kiawe (*Prosopis pallid*), a federally listed noxious species of mesquite tree. Associated species along the northeast side of the parcel include sourbush (*Pluchea carolinensis*) and along the northwest and southwest sides, buffelgrass (*Cenchrus ciliaris*) and other grasses such as guinea grass (*Panicum maximum*). Pickleweed (*Batis maritima*), a succulent-leaf shrub common to saline soils and brackish water, is also common within the understory of the southeast portion of the property.

The Kalaeloa Unit, where mitigation activities are proposed, is located on the flat coastal 'Ewa Plain approximately 7 miles southwest of Pearl Harbor. This Unit was formerly part of the Barber's Point Naval Air Station (NAS) and is a unique example of the dry coastal shrubland habitat that once extended along most of the 'Ewa plain. The small remnant populations of endangered plants including round-leaved chaff flower, as well as other rare native flora, such as an endemic subspecies of naio (*Myoporum sandwicense* ssp. *stellatum*) found only at this site, are clear indicators of the critical importance of this managed and protected refuge unit to these endangered species. The Kalaeloa Unit was established during Barber Point NAS base closure proceedings in 2001 to protect and enhance the habitat for the endangered coastal dryland plants,

round-leaved chaff flower and 'Ewa Plains 'akoko (*Chamaesyce skottsbergii* var. *skottsbergii*).

3. The endangered, threatened, proposed, and candidate species known or reasonably expected to occur in the ecosystems, natural communities, or habitat types in the plan area.

Two individuals of round-leaved chaff flower, a federal and state listed endangered species, have been documented within the project site (refer to Figure 3). One healthy 1 meter (3 foot) tall individual occurs within a crack of exposed limestone and a much smaller individual occurs within similar conditions, 18 inches east of its larger counterpart.

Seeds and cutting of these plants are proposed for collection and are to be contract grown in a local nursery. Outplanting of nursery grown individuals is proposed within the Kalaeloa Unit wherein several extant populations of this plant species occur, as well as Ewa Plains 'akoko.

Kalaeloa Unit also provides a critical site where the genetic integrity of endangered plants can be maintained and where seed reserves can be harvested for future propagation and restoration.

4. The measures or actions to be undertaken to protect, maintain, restore, or enhance those ecosystems, natural communities, or habitat types within the plan area.

Mitigation strategies have been developed within the proposed HCP to minimize and mitigate negative impacts to round-leaved chaff flower as a result of the KIP project and to provide a net recovery benefit for the species.

In order to offset impacts to round-leaved chaff flower from the development of the KIP project, CLDC proposes to conduct in-kind off-site mitigation in the form of habitat restoration and creation. As stated above, the proposed off-site mitigation site is located on preserved lands of the Kalaeloa Unit.

CLDC is currently conducting coordination efforts with NWR staff to receive approval for use of the Kalaeloa Unit as a mitigation site. Outplanting site selection would be determined by the Refuge Manager based on site conditions at the time of planting. All work on the NWR would be conducted under a Refuge Special Use Permit and subject to General and Special Conditions of that permit, as well as conditions of this of this HCP.

Proposed compensatory mitigation efforts would create new populations of round-leaved chaff flower on the Kalaeloa Unit from the genetic stock (seeds and cuttings) of the two individuals that would be impacted as a result of the KIP project. In preparation of the proposed mitigation activities, seed and cutting collection efforts have been coordinated with the DLNR, Division of Forestry and Wildlife (DOFAW) horticulturalist, Greg Mansker. In December 2010, Mr. Mansker collected approximately 100 seeds from the two round-leaved chaff flower individuals located within the KIP project site. Collected seeds and cuttings are currently being stored at the Seed Conservation Laboratory at the Lyon Arboretum Tissue Culture Facility located on O'ahu. Additional seed shall also be collected from the wild plants located on the KIP project site in fall/winter 2011 and funding shall be provided for seeds to be

banked at the Lyon Arboretum. There will be no take of plants at the wild site until a sufficient amount of seed is obtained for storage and propagules are grown from the parent plants.

CLDC proposes to propagate the round-leaved chaff flower seeds and cuttings at a Hui Ku Maoli Ola Native Plant Nursery located in Kaneohe, Hawai'i. Native plant specialist, Mr. Rick Bulboza at Hui Ku Maoli Ola has conducted several round-leaved chaff flower outplanting activities for the NWR within the Kalaeloa Unit with much success. As a professional horticulturist experienced in the propagation and planting of round-leaved chaff flower, Mr. Bulboza will oversee all site preparation and outplanting activities within the NWR.

Upon seed growth, CLDC proposes to outplant approximately 80 individual plants within suitable habitat located on the Kalaeloa Unit. In preparation of outplanting activities, CLDC will conduct habitat enhancement activities, including nonnative species removal within the planting sites, as necessary. Since the exact planting locations have not been chosen within the Kalaeloa Unit at this time, the dominance of native species within the chosen sites is currently unknown. If sites are chosen that are dominated by nonnative species, then habitat enhancement shall include planting of native species upon removal of nonnatives. However, if a site is chosen that is dominated by native species, then planting will not be necessary (although subdominant nonnatives shall be removed). Furthermore, since the baseline conditions of the chosen sites are currently unknown, details regarding site preparation, irrigation, water sources etc. are not provided herein. CLDC proposes to prepare and submit a Planting Plan once site selection has been determined. The Planting Plan shall provide photographs and maps of planting locations and shall provide details regarding baseline conditions, site preparation, planting methods, nonnative weed removal, and proposed pest control methods (as necessary). The Planting Plan shall be prepared in consultation with the project horticulturist and USFWS Refuge staff that have successfully conducted and are currently conducting round-leaved chaff flower outplanting activities within the Kalaeloa Unit. The Planting Plan shall be submitted to DOFAW for approval prior to mitigation activities.

Successful implementation of these mitigation efforts would significantly increase the numbers of new plants on O'ahu as well as improve their quality compared to the in situ disturbed location of the KIP site. These mitigation efforts would also protect the genetic diversity of the existing population and protect existing individuals by relocating them to appropriate habitat within preserved lands, as well as provide education stewardship opportunities within the NWR.

5. A schedule for implementation of the proposed measures and actions.

The mitigation program is proposed for 5-years. Attachment B presents a schedule for mitigation activities.

6. An adequate funding source to ensure that the proposed measures and actions are undertaken in accordance with the schedule.

CLDC will fund all monitoring and mitigation activities. Assurances that adequate funding will be available to support the proposed monitoring and mitigation measures will be provided by CLDC in the form of a performance bond, which will be available to fund mitigation in the unlikely event of a revenue shortfall or, in the worst case scenario, bankruptcy. The bond will be automatically renewed prior to expiration,

unless it is determined to no longer be necessary by the DLNR. In the event of a revenue shortfall or bankruptcy the bond could be drawn upon by the USFWS or DLNR to fund any outstanding mitigation obligations of the project. A single bond or letter of credit shall also be established for contingency funds.

Attachment A HCP MAPS



Project Location

Pearl Harbor International Home Renovation Unit

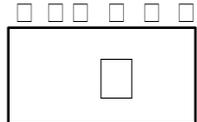
Pearl Harbor International Home Renovation Unit

Pearl Harbor International Home Renovation Unit

Project Location



Project Content
 International Home Renovation Unit
 International Home Renovation Unit





Attachment B SCHEDULE

Kenai Industrial Park Project Habitat Conservation Plan Tentative Schedule

ID	Task Name	Duration	Start	Finish	Timeline																												
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
1	ITL Pre-Application Submittal	0 days	Fri 3/5/10	Fri 3/5/10	◆ ITL Pre-Application Submittal																												
2	HCP Research & Preparation	262 days	Fri 3/5/10	Mon 3/7/11	[Gantt bar from Fri 3/5/10 to Mon 3/7/11]																												
3	National Wildlife Refuge (NWR) Mitigation Site Proposal Submittal	0 days	Mon 1/31/11	Mon 1/31/11	◆ 1/31																												
4	Draft HCP DLNR Submittal	0 days	Mon 3/7/11	Mon 3/7/11	● Draft HCP DLNR Submittal																												
5	DLNR Review/Comment	14 days	Fri 3/4/11	Wed 3/23/11	[Gantt bar from Fri 3/4/11 to Wed 3/23/11]																												
6	Incorporation of Agency Comments	9 days	Fri 3/25/11	Wed 4/6/11	[Gantt bar from Fri 3/25/11 to Wed 4/6/11]																												
7	Revised Draft Submittal	0 days	Fri 6/24/11	Fri 6/24/11	● Revised Draft Submittal																												
8	Public Review Release	60 days	Fri 7/22/11	Thu 10/13/11	[Gantt bar from Fri 7/22/11 to Thu 10/13/11]																												
9	ESRC/BLNR Review	22 days	Fri 7/22/11	Mon 8/22/11	[Gantt bar from Fri 7/22/11 to Mon 8/22/11]																												
10	ESRC Meeting	0 days	Tue 8/23/11	Tue 8/23/11	◆ 8/23																												
11	Tentative ESRC Site Visit	0 days	Wed 9/7/11	Wed 9/7/11	◆ 9/7																												
12	Incorporation of ESRC Comments	7 days	Wed 1/20/10	Thu 1/28/10	[Gantt bar from Wed 1/20/10 to Thu 1/28/10]																												
13	Incorporation of Public Comment	10 days	Thu 10/13/11	Wed 10/26/11	[Gantt bar from Thu 10/13/11 to Wed 10/26/11]																												
14	Planting Plan Submission to DLNR	0 days	Mon 10/31/11	Mon 10/31/11	◆ 10/31																												
15	Planting Plan DLNR Review	30 days	Mon 9/5/11	Fri 10/14/11	[Gantt bar from Mon 9/5/11 to Fri 10/14/11]																												
16	Final Planting Plan Submittal	0 days	Thu 10/20/11	Thu 10/20/11	◆ 10/20																												
17	Final HCP Submittal	0 days	Fri 10/28/11	Fri 10/28/11	● Final HCP Submittal																												
18	HCP Approval	28 days	Wed 1/20/10	Fri 2/26/10	[Gantt bar from Wed 1/20/10 to Fri 2/26/10]																												
19	Plant Nursery Propagation	90 days	Tue 11/1/11	Mon 3/5/12	[Gantt bar from Tue 11/1/11 to Mon 3/5/12]																												
20	NWR Kalaeloa Unit Site Preparation	15 days	Mon 3/5/12	Fri 3/23/12	[Gantt bar from Mon 3/5/12 to Fri 3/23/12]																												
21	NWR Kalaeloa Unit Outplanting	6 days	Mon 3/26/12	Mon 4/2/12	[Gantt bar from Mon 3/26/12 to Mon 4/2/12]																												
22	120-Day Establishment Period Monitoring	120 days	Tue 4/3/12	Mon 9/17/12	[Gantt bar from Tue 4/3/12 to Mon 9/17/12]																												
23	Commencement of 5-year Monitoring Period	0 days	Mon 9/17/12	Mon 9/17/12	◆ 9/17																												

State of Hawai'i
 Department of Land and Natural Resources
 Division of Forestry and Wildlife
 1151 Punchbowl Street, Room 325
 Honolulu, Hawai'i 96813

Incidental Take License Number: ITL-18
 Date of Issue: _____
 Valid Until: 5 years from date of issue

To accompany:

Achyranthes splendens *rotundata*

The Board of Land and Natural Resources hereby grants permission under the authority of Hawaii Revised Statutes §§ 195D-4(g) and 195D-21 and all other applicable laws to:

For take, if such taking is incidental to and not the purpose of the carrying out of an otherwise lawful activity, of the following species:

Round-leaved Chaff Flower	<i>Achyranthes splendens</i> var. <i>rotundata</i>	Two individuals within the 0.75-acre project area	TMK 9-1-074:023
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1. This license only authorizes incidental take of the covered species by the licensee on the lands owned or otherwise controlled by CIRI Land Development Company identified as 9-1-074:023 on the island of O'ahu, Hawai'i at the time this license is issued pursuant to the "Draft Round-leaved Chaff Flower (*Achyranthes splendens* var. *rotundata*) Habitat Conservation Plan for Kenai Industrial Park" dated March 2012 (hereafter "HCP").
2. This license is valid only if CIRI Land Development Company abides by the terms and conditions of the HCP and ITL for the duration of the permit.

3. This license shall become valid upon completion of the following:
 - i. A legal representative of CIRI Land Development Company has acknowledged understanding and agreement to abide by its conditions by signing two copies of this license.
 - ii. Both copies of the signed license must be returned to the Division of Forestry and Wildlife. Upon approval by the Chairperson, a copy of the license will be returned to the applicant.

4. The Board may suspend or revoke this license if the HCP is suspended or revoked. The Board may also suspend or revoke this license in accordance with applicable laws and regulations in force during the term of the license.

By: _____ Date _____

William J. Aila, Chairperson and Member
Board of Land and Natural Resources

The undersigned has read, understands, and hereby agrees to abide by the General Conditions and the Special Conditions stipulated in this license.

CIRI Land Development Company

By: _____ Date _____

Its: _____

CIRI Land Development Company notarized signature is made a part of this document.

Cc: DOFAW
DOCARE
USFWS Pacific Islands Office, Honolulu