Proposed Extension to Cyanotech Corporation's Habitat Conservation Plan and Incidental Take Permit

March 14, 2016

Executive Summary

In 2002, the Habitat Conservation Plan for Hawaiian Stilt at the Cyanotech Aquaculture Facility (HCP) (Ducks Unlimited, Inc.(DU) 2002) was approved and the U.S. Fish and Wildlife Service (USFWS) issued Incidental Take Permit TE051040-0 on 18 March 2002 with a duration of three years, and the State of Hawaii Department of Land and Natural Resources (DLNR) issued an Incidental Take License T&E ES-01 with a duration of one year on 3 April 2002. USFWS and DLNR, hereafter referred to as Wildlife Agencies, authorized incidental take of the endangered Hawaiian Stilt (*Himantopus mexicanus knudseni)* as a result of ongoing operations and maintenance activities of the Cyanotech Aquaculture Facility. On 3 April 2003 a six-month extension of the State Endangered Species permit (Number T&E ES-01) was secured. In December 2003, a new permit (Number WLIT-04) was issued and was valid until 17 March 2005. Following Cyanotech's request, the state permit was extended on 11 March 2005 and the USFWS permit was extended on 9 May 2005 (TE051040-2).

In October 2015, Cyanotech submitted a request to the Wildlife Agencies for extension of incidental take authorization provided by their existing Federal incidental take permit (TE051040-2) and State incidental take license (WLIT-04). The period of time for which the extension is sought is 19 years, until 2035.

Background

Cyanotech Corporation operates a 90 acre facility with in the boundaries of the Natural Energy Laboratory of Hawaii Authority (NELHA) on the Kona Coast of the Big Island of Hawaii. The Company produces nutritional products from microalgae in open culture ponds. In the spring of 2002, as in the previous four years, Cyanotech prepared the 0.69-hectare (1.7 acre) sediment basin as man-made stilt-nesting habitat (the Lake) for the upcoming nesting season. In 2002, the Cyanotech's management of the Lake resulted in 48 stilts fledged while three chicks hatched from this area drowned in production raceways (please see Attachment 1, Hawaiian Stilt Use at Cyanotech Aquaculture Facility 1998-2006). Based on Section 3.4(5)(a)(i) of the HCP "if the total number of fledglings produced in Year 1 is greater than the sum of incidental take in Year 1 plus the incidental take anticipated in Years 2 (2003) and 3 (2004), then management of the Lake as a stilt breeding area may be discontinued upon approval of the Wildlife Agencies." In December 2002, the management of the Lake for Years 2 and 3 was discussed, and primarily due to aviation safety concerns, Cyanotech and Wildlife Agencies agreed to discontinue habitat management for stilt nesting.

In February 2003, the Lake was netted with 1.9 centimeter (cm) polypropylene mesh to provide physical exclusion to the nesting habitat. The netting was monitored daily to check for entangled stilts. Passive hazing methods such as driving the roads of the

facility and deployment of Mylar tape were used to discourage foraging, roosting, and nesting of stilts in the production area of the facility.

On 25 June 2004, Cyanotech formally requested in writing to the Wildlife Agencies a one-year extension to the existing incidental take authorization. This extension was approved and allowed for additional data collection and analysis of the Kona Coast stilt population, continued work on minimization efforts, and the opportunity to identify possibilities for mitigation, if necessary. As part of the extension, Cyanotech funded the Kona Coast water bird surveys through DU, worked with the State Division of Forestry and Wildlife (DOFAW) and funded the labor to provide predator control at the Kealakehe Wastewater Treatment Plant (KWTP) and the Waikōloa Resort treatment plant in an effort to increase survivorship of stilt hatchlings at those facilities.

In October 2005, Cyanotech submitted a request to the Wildlife Agencies for extension of incidental take authorization of their existing incidental take permit and license. Prior to the 2006 amendment (from 1998-2005), Cyanotech took 12 Hawaiian stilt adults and 58 chicks and produced 237 fledglings at the Cyanotech Lake. The Federal permit (TE51050-2) was issued in September, 2006, and the State permit in October, 2005, for a 10 year extension expiring in March, 2016. The HCP required off-site predator control at Opaeula Pond (now called Kapo`ikai) and Kona Coast Waterbird Surveys. HCP implementation has helped improve nesting success at Kapo`ikai Pond and limited incidental take of stilts at the Cyanotech facility. Cyanotech has also significantly reduced stilt numbers at the facility during the breeding and non-breeding seasons, eliminated nesting in hazardous areas at the facility, and funded surveys to monitor stilt use at other wetland sites on the Big Island (Kona Coast) where successful reproduction is probable.

Cyanotech has achieved the success criteria identified in the 2006 HCP Amendment. Success criteria is defined as 1) the total number of stilts fledged at off-site locations is greater than the number of stilts incidentally taken over the course of the ten-year permit term and 2) nesting success (average number of fledglings per nest) at off-site locations managed with predator control is greater than 1. Since 2006, Cyanotech has taken six adult Hawaiian stilts, and 52 Hawaiian stilts have fledged at Kapo`ikai Pond (Table 1). From 2006-2015, the average nesting success at Kapo`ikai Pond (as defined in the success criteria) was 0.95 fledglings per nest, with a nest success range from 0.18 (2013) to 1.86 (2010) fledglings per nest (Table 1). If the very low nest success year of 2013 is removed from the calculation, the average nest success is 1.3 fledglings per nest.

The first Cyanotech HCP was approved in 2002 by the Service and DLNR. Since that time, 48 stilt fledglings were produced at Cyanotech and 55 fledglings at Kapo`ikai Pond. From 2002 to 2015 there was take of 18 stilt adults and 4 stilt fledglings at Cyanotech (Table 1). Because not all fledgling stilts survive to breeding age, we have adjusted the number of adult take to account for the survival rate of fledglings. Based on data from the most recent study of Hawaiian stilts (Reed et al. 2015), it is estimated that 55 percent of first-year stilts survive to breeding age. If this survival rate is applied, each adult that is taken is equivalent to (1 / 0.55) or 1.82 fledglings. Therefore, we have adjusted the incidental take of adult stilts from 2002 to 2015 to account for juvenile survival (Table 1).

Based on these adjusted calculations, the total take of Hawaiian stilts at Cyanotech from 2002-2015 was 37 (33 adjusted adults, 4 chicks). Cyanotech produced 48 stilts at the Cyanotech pond in 2002, and 55 fledglings were produced at Kapo`ikai Pond, for a total of 103 fledgling stilts produced. Therefore, an excess of 66 fledglings stilts was produced during this time period (103 – 37) that can be used for the future HCP term.

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Adult take	0	2	10	0	0	0	0	0	3	0	0	1	1	1	18
Chick take	3	0	0	1	0	0	0	0	0	0	0	0	0	0	4
Adjusted adult take	0	4	18	0	0	0	0	0	5	0	0	2	2	2	33
Fledglings produced at Cyanotech	48														48
Fledglings produced at Kapo`ikai				3	3	3	2	3	13	5	3	3	13	4	55

Project Description

Cyanotech proposes to continue normal microalgae operations, daily monitoring and maintenance at its aquaculture facility, and implementation of minimization measures described below. Microalgae is grown and harvested within 67 raceway ponds that comprise about 48 acres of man-made open-water habitat. To optimize growth of microalgae, the water depth is maintained at approximately 12 inches. The water is hypersaline (20-30 parts per thousand) and alkaline with an average pH between 9.8 and 10.6. Paddle wheels are installed at one end of each raceway to maintain a constant flow of water during daylight hours. Submersible pumps are used to maintain nutrient and water levels and for inoculation and harvesting. Cyanotech conducts daily monitoring at all ponds to locate and remove debris that may damage the mechanical and harvest systems.

Cyanotech will continue to implement deterrents such as modification of gravel raceway berms, hazing (increased human presence, use of lasers and pyrotechnics), mylar tape, predator calls, agitation calls, effigies, and research on reduction of the invertebrate prey base to discourage nesting in hazardous areas and reduce overall stilt foraging and loafing at Cyanotech.

Anticipated Take

The proposed bird deterrent measures are not intended to cause harm; however, implementation of bird deterrents may result in adverse behavioral or physiological reactions to certain forms hazing, disruption of breeding attempts and feeding, and less commonly mortality or injury of adult and/or juvenile stilts. Based upon implementation of minimization measures to date, the likelihood of direct mortality or injury as a result of hazing is minimal. Adult and/or juvenile stilts may continue to visit Cyanotech to forage for invertebrates and loaf in microalgae raceway ponds. While there, stilts remain susceptible to injury or mortality as a result of drowning, adverse physiological reaction to microalgae media, or harmful interactions with raceway machinery (e.g., paddle wheels and/or submersible pumps).

The number of occurrences of take is not expected to exceed two stilts per year with a maximum of 5 stilts per year, and a maximum over the 19-year permit term of 38 stilts . The maximum take of five individuals was determined from the 12-week time span beginning December 2003 where the 10 cases of incidental take occurred. Due to the

success of deterrent measures in reducing number of stilts at the Cyanotech, and that the average take per year from 2002 to 2015 was 1.3, the likelihood of a repeat of the take that occurred during December 2003 to February 2004 is low, and therefore we reduced the worst case take scenario to five adults per year. We do not expect that this worst-case scenario will happen in each of the 19 years.

Minimization and Mitigation Measures

Cyanotech will provide a biological monitor approved by the USFWS and the State (DOFAW) to oversee the following minimization and mitigation measures. Cyanotech will also continue to implement all minimization measures described in the 2002 HCP (Section 3.3.1) as described and updated below.

1)Cyanotech will continue to spray safflower oil 1) in the Spirulina ponds after harvests to control the water boatman (Family Corixidae) and 2) directly onto Euphedra flies (*Euphedra sp*.) during outbreaks of these species. The safflower oil causes both species to float on the pond surface as well as suffocating the Euphedra flies. These insects are removed from the ponds using filter screens. We have also recently found that commercially available "BugZappers" which use UV light to attract bugs and electrical current to kill them is very effective in reducing Euphedra fly population in culture ponds. BugZappers will continue to be used in combination with safflower oil. Cyanotech will also aggressively explore other options and pursue solutions to reduce or eliminate the invertebrate food source from its ponds in order to limit the number of stilts attracted to the site.

2) Cyanotech employees will use bird deterrents to keep adult stilts from raceway ponds. The bird deterrent measures used will be limited to driving or walking on raceway roads several times per day to increase the level of human activity, and placing preventative devices (e.g., Mylar tape) in areas where nest building activities are observed. In addition, Cyanotech employees will utilize more aggressive non-lethal hazing methods (laser, pyrotechnics) approved by the Wildlife Agencies to haze any stilts away from the facility when necessary.

3) Cyanotech will immediately halt use of any bird deterrent or hazing method that results in the incidental take of adult or sub adult stilt until an evaluation of the incident can be conducted by the Wildlife Agencies and Cyanotech is advised on how to proceed.

4) The former DU Pond has been drained and remains dry. No stilts have been attracted to this area for the last 4 years.

5) A 684 KW solar array now covers 80% of the Lake and serves as a deterrent to stilts frequenting this area. The remaining 20% of the Lake is near the Company's parking lot with extensive human activity. Should stilts frequent this area, bird deterrents as describe in point 2 above will be employed.

6) Cyanotech will continue to educate its employees on the continuing activities to protect and conserve endangered Hawaiian Stilts at Cyanotech and on the behavioral cues for breeding stilts. Employees will be advised to continue aquaculture activities with

caution if stilts are exhibiting these behaviors and to provide the biological monitor with any nest, egg, or chick sighting data within three days of any observations.

7) Cyanotech will work with the Wildlife Agencies on identifying additional bird deterrents that may be used as a long-term strategy for reducing incidental take of Hawaiian Stilts at Cyanotech and other future aquaculture facilities planned within NELHA. If a bird deterrent technique requires special training, Cyanotech personnel will seek the required training prior to use.

Mitigation Measures

1) Off-site Predator Control

Predator control is an integral part of water bird species recovery (USFWS 2005). In order to mitigate incidental take at the facility, Cyanotech will fund the implementation of predator control and additional monitoring at Kapo`ikai pond, a privately-owned, 3.24-hectare (8.0 acre) coastal wetland located 7.8 kilometers (km) (4.8 miles) to the north of the Cyanotech facility. Predator control operations will utilize tamper-proof bait stations baited with Diphacanone bait blocks or other means as necessary or available.

Beginning in December 2001, the landowner (Kamehameha Schools) initiated predator control at Kapo`ikai pond. The predator control effort has likely increased the probability of survival for hatchlings of Hawaiian Stilts and Hawaiian Coots (*Fulica alai*) that nest at Kapo`ikai pond (Waddington 2005). Cyanotech is actively working with Kamehameha schools on an agreement that will allow Cyanotech to continue funding the predator control and monitoring efforts at Kapo`ikai. Cyanotech proposes to fund the predator control efforts at Kapo`ikai until 48 fledglings have been produced to account for the projected take of 38stilts at Cyanotech.

If additional sites for off-site mitigation that have a greater potential benefit for stilt recovery than Kapo`ikai pond become available, Cyanotech and the Wildlife Agencies, in consultation with the Endangered Species Recovery Committee (ESRC), will consider such sites for implementation of mitigation measures. The estimated cost of off-site mitigation is $10,000 per year.

2) Kona Coast Waterbird Surveys

Cyanotech will also fund the on-going waterbird survey at six Kona Coast wetland sites that began in 1998. Cyanotech will contract a qualified organization or individual to conduct the survey at the following study sites: Kealakehe Wastewater Treatment Plant, Honokōhau Reef, ʻAimakapā pond, Kaloko pond, Kapo`ikai pond and Kūkiʻo fishponds.

In addition to monitoring habitat use, nesting data and trends, monitoring allows for the opportunity to identify new species, including invasive ones, avian botulism, West Nile virus and other conditions that can adversely affect not only stilt habitat, but habitat for all water birds on the Kona coast. Monitoring has identified and reported fish die-offs at

both KWTP and ‘Aimakapā, subsequently, fish carcasses were removed as not to provide a vector for avian botulism.

Surveys will be conducted once per month and an annual report (covering the period September 1 to August 31) will be prepared. The estimated cost of the surveys and reporting is $5,000 per year.

Monitoring and Reporting

1) If incidental take occurs, Cyanotech will notify the Wildlife Agencies immediately and in writing within 5 calendar days. All stilt remains will be collected and submitted to the USFWS or DOFAW for necropsy and/or scientific preservation. Cause of mortality will be determined if possible. The biological monitor will be responsible for the proper handling, storage, and shipment protocols for all biological material collected on the facility.

2) The annual report (covering the period September 1 to August 31) will be submitted to the Wildlife Agencies by September 30 of each year. The report will include information on the:

    a) management actions taken by Cyanotech during the stilt breeding season;

    b) summary of off-site mitigation efforts (e.g., predator control);

    c) summary of off-site (e.g., Kapo`ikai Pond) nesting success (average number of fledglings per nest) for stilts;

    d) the amount of any incidental take associated with operations and maintenance of the aquaculture facility throughout the entire year, and the suspected causes of the incidental take;

    e) average monthly stilt counts at Cyanotech during breeding and non-breeding seasons;

    f) a description of the deterrent methods evaluated including the number of raceway ponds tested and an assessment of the effectiveness of each deterrent;

    g) recommendations for management and monitoring the next year;

    h) Kona Coast Waterbird Survey Report. (September-August).

Success Criteria

Hawaiian stilt mitigation efforts will be considered successful and Cyanotech will be deemed to have fulfilled their mitigation requirements for the Hawaiian stilt for Project impacts if the following occur:

1) An effective, environmentally safe deterrent for significantly reducing or eliminating Hawaiian Stilt use of raceway ponds at Cyanotech is implemented and results in very few Hawaiian stilts at the Cyanotech facility. The deterrent will be deemed effective only if harm (injury or death) of adult and subadult Hawaiian Stilts at Cyanotech is maintained at a take level of less than two stilts per year.
2) Cyanotech funds predator control at Kapo`ikai pond until the number of fledglings produced exceeds the adjusted take estimate for stilts at Cyanotech.
3) Cyanotech funds monitoring of the Kona Coast wetland sites identified above.
4) Results of predator and monitoring are provided in an annual report to DOFAW and USFWS.

Plan Implementation

This HCP will be administered by Cyanotech Corporation. The HCP is designed to authorize potential incidental take of the Hawaiian stilt as a result of operation of the Cyanotech Aquaculture Facility for a permit term of 19 years. If operation continues past 19 years or if it appears as though take may be exceeded, the HCP and associated ITP and ITL would need to be amended or extended in accordance with then-applicable laws and regulations.

Changed Circumstances, Unforeseen Circumstances, and No Surprises Policy

The USFWS's No Surprises Policy (50 CFR 17.22, 17.32) provides that once an ITP has been issued, and so long as the HCP is being properly implemented, the USFWS will not require the commitment of additional conservation or mitigation measures by the permittee (including additional land, water, or financial contribution, or additional restrictions on the use of land, water, or other natural resources) beyond the level provided in the HCP, without the permittee's consent. At the state level similar assurances are provided in HRS Section 195D-23. This regulation precludes the imposition of mandatory changes in conservation or mitigation measures, which would impose an additional financial burden on the permittee, resulting from circumstances not considered in an approved and properly implemented HCP except as provided for under changed circumstances as set forth below or adaptive management. No Surprises is also not applicable to situations where authorized take levels are exceeded.

An HCP must identify and analyze reasonably foreseeable changed circumstances that could affect a species or geographic area during the permit term (50 CFR 17.3). Should such a changed circumstance occur, the permittee is required to implement the measures specified in the HCP to respond to this circumstance. Conditions that are not analyzed, and for which the No Surprises assurances are designed, are called unforeseen circumstances. Unforeseen circumstances are events affecting a species or geographic area covered by the HCP that: 1) could not reasonably have been anticipated by the applicant, USFWS, and DOFAW during the development of the HCP, and 2) result in a substantial and adverse change in the status of a Covered Species.

Changed Circumstances

Circumstances may change or occur during the life of the HCP, some of which can be anticipated and for which contingency plans can be developed. Changed circumstances which are reasonably foreseeable by are described below.

Listing of New Species or Delisting of a Covered Species
If the federal or state government add a new species that occurs on Hawaii Island to the federal or state endangered species list, Cyanotech will evaluate the likelihood of incidental take of the species due to Project operation. If incidental take appears possible, Cyanotech may seek coverage for the newly listed species under an amendment to the existing HCP. Should the Hawaiian stilt become delisted over the permit term, Cyanotech will engage with USFWS and DOFAW to determine if mitigation measures should be discontinued.

Hurricanes
Hurricanes periodically strike or affect the Hawaiian Islands, and the likelihood of a hurricane causing severe damage on Hawaii Island during the term of the HCP is high enough to merit treatment as a changed circumstance. A hurricane could affect the activities covered by the HCP in several ways:

- Cause significant damage to or destruction of Cyanotech facilities;
- Pose a threat to the Hawaiian stilt by causing injury or death either directly, or indirectly through the destruction of habitat; or
- Alter the natural and built environment in areas surrounding Project facilities in ways that increase or decrease the potential effects of Project facilities on the Covered Species.

Should a hurricane cause significant damage on the Kona Coast of Hawaii during the term of the HCP, any resulting effects on the Covered Species will be considered based on the best available information at the time. The HCP mitigation efforts will be modified to respond to effects from a hurricane should USFWS and DOFAW reasonably determine in consultation with Cyanotech that such a response is necessary.

Invasive Species
Introduced animal and plant species have had, and will continue to have, a detrimental effect on the Hawaiian stilt. The likelihood that the threat from this source will increase during the term of this HCP is sufficient to warrant treating this threat as a changed circumstance. The management measures to be implemented through this HCP could be compromised by new and/or increased populations of invasive species. Should these measures be compromised by invasive species during the term of this HCP, the HCP mitigation efforts will be modified should USFWS and DOFAW reasonably determine in consultation with Cyanotech that such a response is necessary.

Disease
Hawaiian endemics evolved in the absence of many pathogens, and as a result, their lack of resistance to some diseases has played an important role in the declines of many endemic species. The Hawaiian stilt has been found to be susceptible to outbreaks of avian botulism (USFWS 2011d). Should the prevalence of disease increase and become identified as a major threat to the survival of any of these species by DOFAW and USFWS, the HCP mitigation efforts may be modified should USFWS and DOFAW reasonably determine in consultation with Cyanotech that such a response is necessary.

Changes in Distribution of Currently Listed Species
New research could alter the understanding of the potential impacts to species listed at the time this HCP was prepared. The likelihood that our understanding of risks to species and/or the distribution of their populations would change in a manner that would alter the assessment made in preparing this HCP is sufficient to warrant treating this possibility as a changed circumstance. If, as a result of new information, incidental take of a non-covered state or federally listed species appears possible, or if an increase in take of covered species is reasonably anticipated, Cyanotech would seek coverage under an amendment to the existing HCP. Cyanotech would also reinitiate consultation with the USFWS and DOFAW to discuss whether mitigation measures in place meet permit issuance criteria for the non-covered listed species or if additional measures are warranted.

Unforeseen Circumstances and No Surprises Policy
Should the USFWS determine, based on considerations outlined in 50 CFR §17.22(b)(5)(iii)(c), that unforeseen circumstances have arisen during the permit term, the USFWS and DOFAW will notify Cyanotech in writing. The federally listed Hawaiian stilt is considered adequately addressed under this HCP and is, therefore, covered by the USFWS's No Surprises assurances. Similar state No Surprises assurances under HRS 195D-23 apply to the listed species above, as the HCP conditions described for each of these species satisfy the permit issuance criteria under HRS 195D-21.

In determining whether such an event constitutes an unforeseen circumstance, the Service and DOFAW shall consider, but not be limited to, the following factors: size of the current range of the affect species; percentage of range adversely affected by the HCP; percentage of the range conserved by the HCP; ecological significance of that portion of the range affected by the HCP; level of knowledge about the affected species and the degree of specificity of the species' conservation program under the HCP; and whether failure to adopt additional conservation measures would appreciably reduce the likelihood of survival and recovery of the affected species in the wild. The Service and DOFAW shall have the burden of demonstrating that such unforeseen circumstances exist, using the best scientific and commercial data available. Their findings must be clearly documented and based upon reliable technical information regarding the status and habitat requirements of the affected species.

The Service and DOFAW shall neither require the commitment of additional land, water, or financial compensation by Cyanotech without Cyanotech's consent nor shall they impose additional restrictions on the use of land, water, or other natural resources otherwise available for use by Cyanotech under the original terms of the HCP, including additional restrictions on covered actions that are permitted under this HCP.

Funding and Assurances

The ESA and HRS require that HCPs detail the funding that will be made available to implement the proposed monitoring and mitigation plans. HCP implementation typically requires funding for activities associated with Project implementation and mitigation measures. Costs provided in Table 2 are estimates. Cyanotech is committed to providing the funds necessary to complete the avoidance and minimization, mitigation, monitoring,

reporting, and adaptive management as described in this HCP. Funding assurances consistent with state and federal requirements will be provided.

Section 10(a)(2)(B)(iii) of the ESA requires an HCP applicant to ensure that adequate funding for the plan will be provided. Similarly, HRS Section 195D-4(g) requires the applicant to guarantee that adequate funding for the plan will be provided through a financial tool (e.g., an irrevocable letter of credit,), depositing a sum of money in the endangered species trust fund created by HRS Section 195D-31, or provide other means approved by the BLNR, adequate to ensure monitoring of the species by the state and to ensure that the applicant takes all actions necessary to minimize and mitigate the impacts of the take.

An estimate of the costs for funding the proposed implementation of the extended HCP including minimization and mitigation measures, and monitoring are outlined below. Over the 19-year permit duration, it is anticipated costs may fluctuate due to inflation.

Table 2. Estimated Annual Budget

Activity	**Estimated Cost (2015 dollars)**
Biological monitoring and reporting	$15,000
Purchase and installation of bird deterrents	$500
Research and development of methods to reduce invertebrates	$1,500
Off-site mitigation	$10,000
Kona Coast Waterbird surveys	$5,000
TOTAL PER YEAR	**$32,000**

Adaptive Management

The results of the annual monitoring reports will be evaluated by the Wildlife Agencies to determine if the bird deterrents are effective. If the results of the biological monitoring indicate that the bird deterrent measures are not producing the desired effect (reduced stilt populations at Cyanotech, in particular during the non-breeding season), additional deterrents and hazing methods will be investigated and if appropriate, implemented.

Although not anticipated, if incidental take exceeds the number of stilts fledged over any two-year period, then Cyanotech will increase habitat management at Kapo`ikai pond or an additional off-site location. The opportunities exist for additional management efforts i.e., live trapping for predators, removal of feral goats (*Capra hircus*), or habitat improvements such as vegetation removal.

If additional sites for off-site mitigation that have a greater potential benefit for stilt recovery than Kapo`ikai pond become available, Cyanotech and the Wildlife Agencies, in consultation with the ESRC, will consider such sites for implementation of mitigation

measures. Additional off-site mitigation sites on otherwise unprotected private land are preferred over those on public land.

Revisions and Amendments

Minor Amendments to the HCP

Minor amendments are changes that do not affect the scope of the HCP's impact and conservation strategy, change the amount of take, add new species, and change significantly the boundaries of the HCP. Minor amendments do not materially alter the terms of the ITP or ITL. Upon the written request by Cyanotech, the USFWS and DOFAW are authorized to approve minor amendments to the HCP.

Major Amendments to the HCP

Major amendments to the HCP and permit are changes that do affect the scope of the HCP and conservation strategy, increase the amount of take, add new species, or change significantly the boundaries of the HCP. A major amendment requires submittal to USFWS and DOFAW of a written request and implementation of all permit processing procedures applicable to an original ITP and ITL. Major amendments must be approved by the BLNR. A request for an extension of the existing HCP and associated ITP and ITL without major amendments should be submitted a minimum of 6 months prior to the expiration of the ITP and ITL. If provided for by the regulations existing at that time, the HCP will remain valid and in effect during the processing of this request if the renewal or extension is processed during the original permit term and other regulatory criteria are met.

Permit Transfer

In the event of sale of the Project, 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 new owner(s), USFWS, and DOFAW. The permit will be transferred if authorized by the applicable regulations existing at that time.

Literature Cited

Reed, J.M., C.R. Field, M.D. Silbernagle, A. Nadig, K. Goebel, A. Dibben-Young, P. Donaldson and C.S. Elphick. 2015. Application of the complete-data likelihood to estimate juvenile and adult survival for the endangered Hawaiian stilt. Animal Conservation. 18:176-185.

Waddington 2005

Appendices

Include 2002 HCP, 2006 Amendment