Minor Amendment to Cyanotech Habitat Conservation Plan and Extension of Incidental Take Permits

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 2005, 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 following proposed amendment incorporate the HCP and one-year extension. The period of time for which the amendment is sought is ten years.

Background

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. The use of more aggressive non-lethal hazing methods, per the HCP (Section 3.7 c) were approved by the Wildlife Agencies. A laser and pyrotechnic devices were purchased and employed to further

discourage stilts from frequenting and utilizing the facility. There have been no nesting attempts on the Cyanotech facility since 2002. The incidental take of Hawaiian stilt at Cyanotech in 2003 was two adults.

Beginning 2 December 2003, the first two of ten incidences of take over the next 12 weeks, were recovered from production raceways. The Cyanotech biologist suspected that intraspecific aggression of adult pairs towards first year subadults was the primary cause of the increase in mortalities. While the nesting habitat was being managed, intraspecific aggression was commonly observed especially during the months leading up to and through the nesting season. The total amount of incidental take at Cyanotech in 2004 was 10 adults or subadults.

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 waterbird 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.

Cyanotech has made significant progress toward achieving the success criteria identified in the HCP (Section 3.2). To date, HCP implementation has resulted in 48 fledglings and has limited incidental take to 16 (3 chicks and 13 adults) thereby creating net reproductive benefit of 16 fledglings or 7 adults (see calculations in Appendix 1). This remainder of stilt fledglings as a result of HCP implementation is available to mitigate future incidental take under this amendment. In addition, a total of 189 chicks had previously fledged from the managed Lake habitat during the 1998 to 2001 stilt breeding seasons. Cyanotech has also significantly reduced stilt numbers at the facility during the breeding and non-breeding seasons. Cyanotech has 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.

Anticipated Take

Following the issuance of incidental take authorization in March 2002, there have been 16 Hawaiian stilt mortalities at Cyanotech. It is suspected that the reduction of the invertebrate food source in the production raceways and improved methodology of hazing strategies has resulted in a significant reduction of stilts frequenting the facility. In 2002, the last year the Lake was managed for stilt nesting, the mean number of stilts at the facility per week was 105.88 individuals. In 2003, the first year the nesting habitat was not managed after five years of management, the weekly mean number of stilts at the facility was 50.15 individuals. Weekly means for 2004 and 2005 were 23.13 and 0.05 stilts, respectively.

The number of occurrences of take is not expected to exceed two adults per year with a maximum of 10 adults per year. The maximum take of 10 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, the likelihood of a repeat of the take that occurred during December 2003 to February 2004 is low.

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 HCP (Section 3.3.1).

Mitigation Measures

1) Off-site Predator Control

Predator control is an integral part of waterbird species recovery (USFWS 2005). In order to mitigate incidental take at the facility, Cyanotech will fund and implement predator control and additional monitoring at ʻŌpaeʻula 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 or other means as necessary.

Monitoring will be conducted at a frequency of once per week during the breeding season, once nesting is observed, to document nesting success (average number of fledglings per nest) and to determine the effectiveness of predator control. Additionally, monitoring of waterbirds and nesting is conducted while the bait stations are being maintained providing a more accurate data set for the site.

Beginning in December 2001, the landowner initiated predator control at ʻŌpaeʻula 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 ʻŌpaeʻula pond (Waddington 2005). At this time, however, the landowner does not have dedicated funding for predator control at ʻŌpaeʻula pond, therefore, the funding provided by Cyanotech fills an important conservation need for Hawaiian Stilt recovery.

If additional sites for off-site mitigation that have a greater potential benefit for stilt recovery than ʻŌpaeʻula 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 $5,000 per year.

Table 1. Stilt Nesting at ʻŌpaeʻula Pond 2002 – 2005

Year	Number of nests	Number of hatchlings	Number of fledglings
2002	2	5	3
2003	3	5	5
2004	2	7	7
2005	2	3	3

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, ʻŌpaeʻula 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 effect not only stilt habitat, but habitat for all waterbirds on the Kona coast. Monitoring has identified and reported fish die-offs at both KWTP and ʻAimakapā, 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 $3,900 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 July 1 to June 30) will be submitted to the Wildlife Agencies by September 1 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., ʻŌpaeʻula 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; and

h) the Kona Coast Waterbird Survey Report.

Funding

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

Table 2. Estimated Annual Budget

Activity	**Estimated Cost (2006 dollars)**
Biological monitoring and reporting	$15,000
Purchase and installation of bird deterrents	1,000
Research and development of methods to reduce invertebrates	1,500
Labor for hazing activities	3,200
Off-site mitigation	5,000
Kona Coast Waterbird surveys	3,900
TOTAL PER YEAR	**$29,600**

Cyanotech will also create and maintain a contingency fund of $10,000 in the event additional mitigation is required for adaptive management. The contingency fund will be available each year at the full amount throughout the permit term. If at any time the contingency fund is used, Cyanotech shall restore the contingency fund to its full amount by September 30 for use in the following 12-month period.

Cyanotech will provide funding assurances by demonstrating proof of some type of financial instrument, e.g., bond, line of credit, in the amount equal to the estimated cost of implementation during a year ($29,600 in 2006 dollars) and maintenance of the

contingency fund ($10,000 in 2006 dollars) prior to permit issuance and annually thereafter.

Success Criteria

In addition to Success Criteria described in Section 3.4 of the HCP, implementation of this amendment will aim to achieve following:

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.

2) Nesting success (average number of fledglings per nest) at off-site locations managed with predator control is greater than 1.

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 ʻŌpaeʻula 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. A contingency fund of $10,000 will be created and maintained throughout the permit term to cover such circumstances.

If additional sites for off-site mitigation that have a greater potential benefit for stilt recovery than ʻŌpaeʻula 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.

Attachment 1. Hawaiian Stilt Use at Cyanotech Aquaculture Facility 1998-2006*

	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Average Monthly Count of Adults	53	56	84	99	104^{B} 113^{NB}	16^{B} 84^{NB}	8.6^{B} 38^{NB}	0.31^{B} 0.38^{NB}	No data
Nesting Pairs (Est.)	20	34	61	42	93	-	-	-	-
No. of Fledglings Produced	33	31	84	41	**48**	-	-	-	-
Nests @ Airport	4	0	0	1	3	0	0	0	0
Stilt Mortalities @ Airport	3	0	0	3e	8e, 1h	0	0	0	0
Incidental Take of Chicks	1	29	10	14	3	0	0	0	0
Incidental Take of Adults	0	0	0	0	0	2	10	0	1
Adjusted Incidental Take – Fledglings*					**3**	**4.3**	**21.7**	**0**	**2.1**
Fledglings Produced minus Adjusted Incidental Take					**45**	**40**	**18**	**18**	**16**

*Cyanotech received federal and state incidental take authorization since March 2002. From 1998 to 2002, Cyanotech, Ducks Unlimited, and the Wildlife Agencies worked cooperatively in development of the HCP and to minimize impacts to and maximize opportunities for Hawaiian stilt recovery. (Source: Ducks Unlimited 2002, Cyanotech 2002, 2003, 2004, 2005).

B = Average monthly Hawaiian Stilt count during breeding season (March to August)
NB = Average monthly Hawaiian Stilt count during non-breeding season (September to February)
e = Hawaiian Stilt eggs
h = Hawaiian Stilt hatchlings

*Adjusted Incidental Take takes the survival rate of fledglings into account with respect to incidental take of adults versus chicks. Based on re-sighting of banded birds in a previous study, it is estimated that 46 percent of first-year stilts survive to breeding age (Reed et al. 1998). If this survival rate is applied, each adult would be equal to (1 / 0.46) or 2.17 fledglings. Therefore, the incidental take of adult stilts (observed from 2003 to 2006) is adjusted in terms of fledglings in order to approximate the net conservation benefit as of the end of 2006 as follows:

2002: 48 fledglings – (incidental take of 3 chicks) = 45 fledglings

2003: 45 fledglings – (adjusted incidental take of 4.3 fledglings) = 40 fledglings

2004: 40 – (adjusted incidental take of 21.7 fledglings) = 18 fledglings

2005: 18 fledglings (no incidental take)

2006: 18 fledglings – (adjusted incidental take of 2.1 fledglings) = 16 fledglings