

**Cyanotech Corporation Conservation Plan for  
Hawaiian Stilt (*Himantopus mexicanus knudseni*)  
Annual Report for 2008**



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## **Abstract**

This annual report covers data collected August 2007 to July 2008 for the Conservation Plan for Hawaiian Stilt (*Himantopus mexicanus knudseni*) at Cyanotech Aquaculture Facility. The nesting habitat and Ducks Unlimited raceway continued to be maintained in a manner unusable to the stilts. Cleaning the *Spirulina* production raceways reduces the invertebrate food source. The total amount of Hawaiian Stilt incidental take at Cyanotech was zero. There were no nests at the Cyanotech facility or in the lava field of Keahole International Airport. It is suspected that a stilt nest did occur at a facility adjacent to Cyanotech. One stilt hatchling was observed at Coast Seafood's facility on July 26<sup>th</sup>. The adult pair later walked the hatchling to a series of evaporation ponds at Cyanotech. The hatchling fledged from these ponds on August 22<sup>nd</sup>.

## **Facility Management**

### **Nesting Habitat**

Netting erected over the nesting habitat in February 2003 to provide physical exclusion to the 0.69-ha man-made nesting habitat has been removed. The netting has sustained severe wind damage over the past few years and only covered a portion of the habitat. Additional Mylar deterrents have been placed in the habitat. Three 90-watt floodlights are above the nesting habitat and illuminate the habitat at night. The floodlights were positioned on the North side of the habitat and operated by a photocell switch turning the lights on at sunset and off at sunrise. In the fall of 2007, Cyanotech initiated a “major” cleaning of its *Spirulina* production raceways and hold pond. The former nesting habitat basin was utilized, as originally intended, as a repository for the sediment generated during the cleaning process. The quicksand like sediment uniformly covered the bottom of the former nesting habitat. The sediment dried into a very fine powder and does not provide stilts with preferred nesting conditions. No stilts have been observed at the former nesting habitat. The former habitat is monitored daily.

### **Production Area**

In 1998, a production raceway was converted into a stilt-nesting habitat and became known as the “DU raceway”. In 2003 the former DU raceway was netted as per recommendation of the 2002 annual report. The DU pond netting has also received considerable wind damage. The pond remains partially covered by the net. Sediment from cleaning operations has been deposited into the pond. The pond was monitored daily to and there was no use by stilts observed.

### **Raceway Cleaning**

An aggressive method of removing the invertebrate food source was to drain the production raceways, allow them to dry, and sweep out the sediment and invertebrates. Draining and cleaning the raceways is part of the normal operation and maintenance of *Spirulina* Production. Raceways have been cleaned on average of twice every 12 months. Raceway cleaning is based upon visual inspection of each raceway. Raceways with the most invertebrates are taken out of production for cleaning.

During the “major” cleaning efforts in the fall of 2007, all *Spirulina* raceways were drained and cleaned within a two-month period of time. Cleaning efforts have continued as a on going part of production operations.

## **Property Outside of Cyanotech Boundaries (Lava Field of Keahole International Airport and ‘Opae’ula pond)**

The lava field adjacent to the Cyanotech facility, where stilts had nested in past years, was monitored weekly for nesting activity. Surveys were conducted every Saturday during the nesting season. A Nikon 20 x 60 Fieldscope and Zeiss 10 x 40 binoculars were used to survey the lava field. There were no instances of stilts being observed in the lava field.

Additionally, as part of the conservation plan, Cyanotech funds predator control efforts at 'Opae'ula pond. 'Opae'ula pond is a 3.24 hectare coastal wetland located in the North Kona district of Hawai'i Island. The wetland is utilized for foraging by migratory waterbirds and shorebirds as well as for nesting by endangered Hawaiian Stilts (*Himantopus mexicanus knudseni*) and Hawaiian Coots (*Fulica alai*). The coastal area mostly consists of dry scrub, non-native vegetation. The vegetation around the perimeter of wetland consists mostly of Kiawe trees (*Prosopis pallida*) and other non-native scrub type vegetation.

Predator control was implemented in an effort to increase survivorship of all life stages of nesting Hawaiian Stilts and Hawaiian Coots, by reducing densities of Small Indian mongooses (*Herpestes auro-punctatus*), Rats (*Rattus spp*), and European House Mouse (*Mus domesticus*). Predator control efforts consisted of utilizing 27 tamper-resistant bait boxes around the perimeter of the wetland baited with Diphacinone rodenticide. The predator control work and wildlife surveys were conducted on the second and forth Monday of each month.

In 2008, to date there have been two stilt nests with two fledglings at Opae'ula pond. While the scope of this conservation plan is to benefit/mitigate Hawaiian Stilts, there has been one coot nest with three hatchlings at the time of writing.

## **Stilt Counts, Nesting, Hazing and Incidental Take**

### **Stilt Counts**

There were no stilts observed on any of the weekly surveys until July 31<sup>st</sup> after an adult pair and hatchling had been observed at an adjacent facility. The pair then walked the hatchling to a series of evaporation ponds utilized by the Spirulina process facility. The hatchling fledged from these ponds on August 22<sup>nd</sup>.

Stilt counts are conducted weekly throughout the year. Past hazing efforts have been successful in reducing the numbers of stilts frequenting the facility and also resulted in no nesting at the facility. The stilts have become conditioned to the point that merely driving in their vicinity is enough to have them leave the facility with minimal if any use of either the laser or the pyrotechnics. It is known that stilts do still frequent the facility at night, the numbers are fewer than ten and a few nights of late night hazing is enough to deter them from returning for several months.

### **Nesting**

There were no nests at the Cyanotech facility or in the lava field of Keahole International Airport. The hatchling is suspected to have originated from a nest at Coast Seafood facility adjacent to Cyanotech.

### **Hazing**

Hazing efforts consisted of utilizing mylar tape in areas previously utilized by stilts and driving the facility in golf carts. While it is known that stilts will at times frequent the facility late at night, noting the reluctance of the stilts to stay in the area and the low number of individuals (under ten) at the facility, the need to utilize the laser and pyrotechnics hazing devices was not warranted.

## **Incidental Take**

As per the Conservation Plan, surveying for incidental take was conducted twice per week during the nesting season and once per week during non-nesting season. However, monitoring for injured or dead stilts was conducted daily as part of normal operations of the production raceways. Surveying the raceways for debris was conducted daily in an effort to protect the mechanical and harvest systems of the production raceways. Surveying the raceways visually is conducted first thing in the morning, before the paddlewheels were turned on.

The total amount of incidental take at Cyanotech for 2008 was zero.

## **Recommendations and Requests**

Continue to modify and improve current deterrent measures as well as identify and research new deterrent measures for the facility.

Continue to modify and improve methods of reducing the invertebrate food source in the production raceways.

It is recommended that Cyanotech operate at 100% of production capacity during the stilt-nesting season (March-August). If this is not possible, idle raceways should be filled with seawater to prevent stilts from nesting in the idle raceways.

Cyanotech requests that the Wildlife Agencies continue to work cooperatively with the Cyanotech staff to provide technical assistance on policy and conservation issues, as well as biological expertise (e.g., compliance, adaptive management, bird deterrents, etc.).

## **References**

Evans, K. and Uyehara, K. 2001. A Conservation Plan for Hawaiian Stilt at Cyanotech Aquaculture Facility Keahole Point, Hawaii. Ducks Unlimited Inc. 76 p.

Waddington, J.S. 2007. Cyanotech Corporation Conservation Plan for Hawaiian Stilt (*Himantopus mexicanus knudseni*) Annual Report for 2007. August 11 ,2007. Cyanotech Corporation. 4 p.