



# The Shorebird

The AZA Charadriiformes TAG'S Newsletter 2014

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## TAG MISSION

The mission of the Charadriiformes Taxonomic Advisory Group is to coordinate management of captive Charadriiformes in North American collections, as well as participate in and support relevant conservation efforts.

## AZA Charadriiformes TAG

### **AZA Charadriiformes Steering Committee**

Chair: Cindy Pinger, Birmingham Zoo  
Vice-Chair: Aimee Greenebaum, Monterey Bay Aquarium  
Secretary: Cody Hickman, Brookfield Zoo  
Hannah Bailey, Houston Zoo  
Aliza Baltz, Ph.D, Philadelphia Zoo  
Cheryl Dykstra, John Ball Zoo  
Megan Ross, Ph.D, Lincoln Park Zoo  
Tom Schneider, Detroit Zoo  
Paul Schutz, Disney's Animal Kingdom  
Debbie Zombeck, North Carolina Zoological Park  
Pamela Harmon, Buffalo Zoo  
Anne Tieber, St. Louis Zoo  
Colleen Lynch, Riverbanks Zoo  
David Oehlar, Bronx Zoo  
Robert Webster, Cincinnati Zoo

### **Advisors:**

#### **Veterinary**

Dr. Stephanie McCain, DVM, Birmingham Zoo  
Dr. Terry Norton, DMV, St. Catherines Island Center

#### **Education**

Sarah-Mae Nelson, Monterey Bay Aquarium

#### **WCMC Liaison**

Harrison R. Edell, Dallas Zoo

### **Program Leaders:**

Cindy Pinger, Spotted Dikkop, Birmingham Zoo  
Diane Lavsa, African Jacana, National Aviary  
Phillip Horvey, Masked Lapwing, Sedgwick County Zoo  
Vacant, Spur-winged Lapwing  
Sara Perry, Common Murre, Tufted Puffin, Horned Puffin, Seattle Aquarium  
Stephanie Huettner, Atlantic Puffin, Omaha's Henry Doorly Zoo & Aquarium  
Carmen Murach, Black-necked Stilt, Northeastern Wisconsin (NEW) Zoo  
Sunny Nelson, Inca Tern, Lincoln Park Zoo

### **Species Champions:**

Aimee Greenebaum, Snowy Plover, American Avocet, Monterey Bay Aquarium  
CJ McCarty, Black Oystercatcher, Oregon Coast Aquarium

## AZA Charadriiformes TAG Update

As the TAG chair, I would like to recognize a lot of hard-working people that are doing a lot for the Charadriiformes TAG.

The program leaders have been very busy this year and have gotten either their studbook or population plan published this year.

Sara Perry has done an incredible job and published everything for three species: The Common Murre and Horned and Tufted Puffins. If interested in any of these birds for your collection please contact her at [S.Perry@seattleaquarium.org](mailto:S.Perry@seattleaquarium.org).

Also Stephanie Huettner published the Atlantic Puffin plan and she can be reached at [stephanieh@omahazoo.com](mailto:stephanieh@omahazoo.com)

Sunny Nelson published the Inca Tern plan and can be reached at [SNelson@lpzoo.org](mailto:SNelson@lpzoo.org).

Carmen Murach has published the Black-necked Stilt studbook and is working on the population plan and can be reached at [Murach\\_CD@co.brown.wi.us](mailto:Murach_CD@co.brown.wi.us).

I have gotten the Spotted Dikkop studbook published and hope to have the plan complete by early 2015. It has been a great year for the Spotted Dikkop population. After many years of being the SSP coordinator, the Birmingham Zoo finally fledged a chick!! If interested in Spotted Dikkop please contact me at [cpinger@birminghamzoo.com](mailto:cpinger@birminghamzoo.com).

I would like to thank Phillip Horvey, Senior Zookeeper at the Sedgwick County Zoo, for taking on the studbook for the Masked Lapwings.

Another huge thanks goes out to Aimee Greenebaum, Vice-chair, and Cody Hickman, Secretary and newsletter editor. Thank you everyone for everything you do for this group of birds!

## Training and Enrichment

### Alaska SeaLife Centers Training Program

By: Tasha DiMarzio

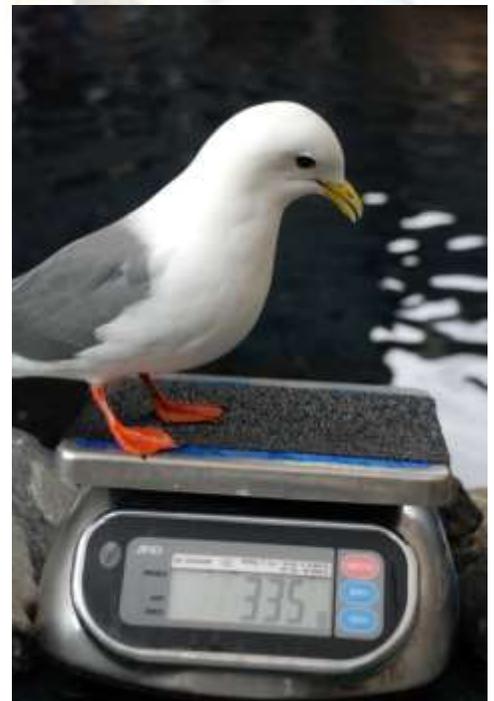


Training alcids is not a common practice in most zoos and aquariums. The Alaska SeaLife Centers Avian department started a Seabird training program in 2006 in order to observe our birds up close for any health issues and for managing weights. Some birds learn more than others, but most have at least one simple behavior learned: scaling. Scaling involves a bird stepping up on a scale and receiving food as positive reinforcement, which is simple yet effective. The birds caught on very quickly and scale sessions occur one to two times daily to keep the birds in practice.

Daily massing has become an incredibly useful tool in monitoring the health of the flock at the ASLC. Weight loss or gain is possibly the easiest way to detect if there is a medical concern for a bird. By recording daily weights we have learned the individuals normal weight ranges and fluctuations throughout the year. When they step up onto the scale they not only get reinforced they also receive their daily vitamins and

some birds receive medications. Obtaining voluntary weights without catching and stressing the bird is uncommon practice, but a major part of daily husbandry at the ASLC.

One of the biggest benefits to training has been the ability to know when a female is egg heavy and when the egg has been laid. Many alcids (puffins, auklets, guillemots) are burrow nesters, and because we get weights daily we are able to see the weight gain and then sudden drop once the female has laid minimizing disturbance on the burrows by keepers checking for eggs.





Other benefits to scale training are the ability to see the birds up close to look for signs of bumble or frostbite, molting patterns and their bills when growing in or sloughing off their bill sheaths.

Over the years the training program has since grown from medial behaviors such as scaling, kenneling, holding for nail trims and showing wings, to involve behaviors for education. The birds that are chosen to be education birds are based on personality and the desire to work with aviculturist but they are still part of the breeding flock. They step up onto hands or platforms to station while in front of classrooms or

keeper chats, target, show their wings, and even paint mats to help raise funds for the enrichment program.

The Alaska SeaLife center has had such a huge success with training a typically non-trained species that we encourage other facilities to start a training program and benefit from the knowledge you will gain.

### North Carolina Zoo's Alcid Enrichment Items

The following items are used to enrich our Parakeet Auklets, Horned Puffins and Thick-billed Murres. We use these items to stimulate natural behaviors (i.e.: investigating, material gathering, nesting, bathing) and to help with displaced aggression.

**Boat:** ½ plastic barrel cut lengthwise (~ 3' x 1 ¾') with small rope loop. Floated in pool or on walkway. (Pic 1).

**Boomer ball:** 9" ball, with plastic shapes attached. (Pic 2).

**Caution cave:** ½ plastic traffic barrel with 16"x 16" doorway and short kelp strands attached to the top. (Pic 3).

**Cow nursers:** rubber. (Pic 4).

**Easter eggs:** 2 – 3" colorful plastic eggs that can be left halved or put together. (Pic 4).

**Flooding exhibit walkway:** exhibit drains are covered and walkway is flooded with less than 6" of water.

**Floating donut:** large plastic donut with nomad platform with rope covered in PVC. Floated in pool or on walkway. (Pic 1).

**Floaty steps:** nomad covered plastic lid with ½ nomad covered Very kennel attached. 2 plastic buoys and cable tie loop on bottom. Can be floated in pool or placed on walkway. (Pic 5).

**Floaty Food Tray:** Garbage can lid with neoprene covered pool noodle and nomad slip cover. Floated in pool or on walkway. (Pic 6).

**Jingle Bells:** 4 stainless steel cow bells. Placed on walkway, attached to wall anchors, or attached to PVC frame. (Pic 4).

**Kelp balls:** 4" Wiffle ball with plastic kelp stuck through holes. (Pic 7).

**Kelp logs:** 2 26"x 3" PVC pipes with 3 – 4 kelp strands. Some removable shower curtain leaf cut-outs. (Pic 8).

**Kelp Rock:** small plastic container spray painted with kelp leaves stuck through holes in bottom. (Pic 7).

**Laser pointer:** cat toy operated by keepers.

**Loose kelp:** short and long strands. Leaves are original and permanent or removable shower curtain cut-outs.

**Moss cubes:** moss frozen in ice cubes trays.

**Murre decoys:** two plastic decoys painted to look like our Thick-billed Murres. (Pic 5).

**Nomad tunnels:** ~17"x 9" PVC pipe cut in half lengthwise and covered with nomad. (Pic 2).

**Ping pong balls:** small plastic white and yellow balls. (Pic 4).

**Plastic sea creatures:** including anemone, jellyfish, and octopi. (Pic 9).

**Shell ball:** small shells glued to a plastic Wiffle ball. (Pic 4).

**Shells:** clam, oyster, conch, and mussel shells of various sizes with sharp edges filed down. (Pic 3).

**Sled:** snow sled with rope covered in PVC. Can be floated in pool or placed on walkway. (Pic 9).

**Slow release feeder:** PVC tube 2' long, spray painted, with various sized holes. Fill with insects (mealworms and crickets). (Pic 10).

**Sprinkler:** garden sprinkler head with various sprinkle settings.

**Sprinkler hose:** soaker hose stretched along walkway or in pool.

**Sugar Shack:** nomad covered milk crate with 2 plastic buoys and cable tie loop on bottom. Floated in pool or on walkway. (Pic 11).

**Teeter totter:** Plastic food pouches attached and covered in nomad. (Pic 7).

**Tree:** spool with shower curtain kelp leaves attached to top. (Pic 8).

**Yellow tunnel:** part of plastic children's slide with nomad cover and pieces of shower curtain kelp attached on sides. (Pic 12).

#### **Pictures:**



1. Boat and Floating donut.



2. Boomer ball and Nomad tunnels.



3. Caution cave with Shells.



4. Jingle bell with frame, Shell ball, Cow nurser, Ping pong balls, and Easter eggs.



5. Floaty steps with Murre decoys.



6. Floating food tray with nomad cover.



7. Teeter totter, Kelp rock, and Kelp ball.



8. Kelp logs and Tree.



9. Sled with Plastic sea creatures inside.



10. Slow release feeder.



11. Sugar shack.



12. Yellow tunnel.



13. Puffins with kelp rock.



14. Puffins in caution cave (floating).

# Conservation

## Conservation Field Notes

By: Aimee Greenebaum, Associate Curator of Aviculture

Both the Monterey Bay Aquarium and the Detroit Zoological Society had a busy summer helping with the rehabilitation efforts of two different shorebird species: The threatened Western Snowy Plover and the endangered Piping Plover.

Twenty-five staff members from twelve AZA institutions participated in the Great Lakes Salvage Captive Rearing Program. Abandoned eggs were brought to the captive rearing station at the University of Michigan Biological Station where they were incubated, hatched, and reared. Twenty-three chicks, along with a rehabbed wild chick, were released. There were 109 parent reared chicks from 81 nests so the captive reared chicks represent 18% of the 2014 production. This project is partially funded by a National Fish and Wildlife Foundation grant.



Western Snowy Plover Photo credit: Monterey Bay Aquarium



The Monterey Bay Aquarium received 39 western snowy plover individuals that included eggs, chicks and adults. Of those received, 20 of them were able to be reared and released back into the Monterey Bay.

For more information about the Great Lakes Piping Plover project, please contact Tom Schneider at [tschneider@detroitzoo.org](mailto:tschneider@detroitzoo.org) or Bonnie Van Dam at [bvandam@detroitzoo.org](mailto:bvandam@detroitzoo.org).



Piping Plover release Photo Credit: Alice Van Zoeren

For more information about the Western Snowy Plover project, please contact Aimee Greenebaum at [aagreenebaum@mbayaq.org](mailto:aagreenebaum@mbayaq.org).

## Success of captive-rearing for a threatened shorebird

By: Kriss Neuman

[Kneuman@pointblue.org](mailto:Kneuman@pointblue.org)

Captive breeding, rearing and reintroduction programs have been used extensively to support conservation efforts for a wide array of threatened species but they require extensive financial resources and are prone to failure for a variety of reasons. It is essential to determine the effectiveness of these programs if limited resources are to be spent on them for the recovery of rare species. In Monterey Bay, California, a small number of Snowy Plover eggs and chicks abandoned by their parents are reared by the Monterey Bay Aquarium each year to support conservation efforts for this federally

threatened species. After release back into the wild, we studied these captive-reared plovers as part of our annual efforts to track the long-term status of the Monterey Bay snowy plover population.

We examined how well they survived and reproduced compared to wild-reared plovers that were exactly matched by age and sex. We found no differences in survival or reproductive output between captive and wild plovers.

We attribute the success of captive-reared plovers in the wild to multiple factors. There was minimal evidence of behavioral deficits, such as habituation to humans or failure to select appropriate habitat, resulting from the captive environment which can be a common stumbling block for captive-rearing programs. There was a large existing wild plover population at the Monterey Bay release site, which may have encouraged newly released plovers to remain in the area during winter and to join the breeding population, thereby avoiding the risks of moving to another site. There may have been social benefits gained from joining a large group, as it is probably easier to learn crucial skills of predator avoidance. In addition, the habitat quality at the release site was high due to historic and ongoing efforts to manage beaches for this imperiled plover. Our findings demonstrate that captive-rearing is a valuable tool to support ongoing Snowy Plover conservation efforts.

### Main Points

Snowy Plovers that were reared in captivity and released back into the wild survived and reproduced at rates similar to their wild-reared counterparts.

The success of captive-reared plovers in the wild was probably due to multiple factors including the rearing environment, the large number of wild Snowy Plovers and the habitat quality at the release

site.

We believe that captive-rearing is an effective tool to support ongoing Snowy Plover conservation efforts, and may be relied upon in the event that nests need to be salvaged due to catastrophic events such as an oil spill.

of captive-rearing for a threatened shorebird. Endangered

Neuman, K.K., L.E Stenzel, J.C. Warriner, J. L. Erbes, C.R. Eyster, G.W. Page, E. Miller, and L.A. Henkel. 2013. Success

## Red knots Volunteer

By: Lori Smith

Red knots (*Calidris canutus*) are a small-medium sized shorebird. There are 6 subspecies of red knot. A majority of the population of *rufa* red knot winters in Tierra del Fuego (the southernmost point of South America) with its breeding grounds in the Canadian Arctic. During their migration, one of the most important stopover points are the beaches of the Delaware Bay. Here the birds have a 2-3 week period of time to refuel for the rest of their journey to their breeding grounds in the Arctic. The birds arrive in early-mid May and leave in early June. Their migration is timed precisely with the spawning of horseshoe crabs. Horseshoe crab eggs are an energy rich, easily digestible food that birds can use to gain a lot of weight in a very short period of time. The decline in the population of horseshoe crabs over the last 30 years in the Delaware Bay has reduced the amount of eggs available for animals that depend upon them for survival. This project collects data from primarily red knots to determine the health of the population due to environmental impacts. Volunteers will help wildlife biologists and researchers collect biometric data.

Volunteers can help on both sides of the Delaware Bay:

**For Delaware side** please contact

Kevin Kalasz- project manager - [Kevin.Kalasz@state.de.us](mailto:Kevin.Kalasz@state.de.us)

Or Delaware Shorebird Project - [deshorebirds@gmail.com](mailto:deshorebirds@gmail.com)

Please contact in **late March/ early April** for the upcoming field season

They recommend people volunteer for a minimum of three days so that they can ensure volunteers are exposed to all aspects of their monitoring work. They rent a field house in Slaughter Beach DE, and can provide food and housing options, either floor space or there is always room for a tent in the backyard, for volunteers while they are there.

As far as a list of items to bring with them here is an initial list:

Binoculars

Sun Screen

Insect Repellent

**Rain Gear!**

Water bottle

A small notebook and writing implement something that works well in damp conditions

Boots or old shoes that you don't mind getting wet

A backpack to carry things to the field

Enthusiastic attitudes!

**For New Jersey side-** please contact

Larissa Smith

Biologist/Volunteer Manager

Conserve Wildlife Foundation of NJ

2201 County Route 631

Woodbine, NJ 08270

609-628-2103

Direct: 609-628-040

[Larissa.Smith@conserwildlifenj.org](mailto:Larissa.Smith@conserwildlifenj.org)

Again, please contact in **late March/ early April** for the upcoming field season

They also recommend people volunteer for a minimum of three days so that they can ensure volunteers are exposed to all aspects of their monitoring work. There are several hotels and many campgrounds in the area around Reeds Beach, NJ.

In addition to Kevin's recommendations, bring whatever gear/food you would need to stay comfortable, fed and hydrated on a hot sunny day or a cold, wet, windy day out in the field for several hours.

## Breeding

### Breeding Egyptian Plovers (*Pluvianus aegyptius*) at the Denver Zoo

By: Stacy Johnson and Travis Garret, Bird Keepers, Denver Zoo  
sjhonson@denverzoo.org, tgarrett@denverzoo.org

#### Denver Zoo Exhibits

Egyptian plovers (*Pluvianus aegyptius*) are currently in two different locations at the Denver Zoo. One breeding pair resides at our Avian Propagation Center, an off-exhibit location. Their enclosure is paneled off from staff viewing for minimal disturbance. It consists of a large sandy area with a few silk plants along the ground, a small dump and fill pool and outdoor access (Fig 1).



Figure 1. Avian Propagation Center Egyptian plover enclosure

Another breeding pair is housed in our large public exhibit building, Bird World. This open-fronted exhibit has a water course closest to the guests, a large sandy area and live plants. During the breeding season, a wall graphic (Fig. 2) covers the entire guest viewing area to give these birds the privacy needed during breeding.

We have found that these plovers have the best breeding success rate in enclosures that are 16' x 20' or larger, with an ambient air temperature of 70-75F.

#### Breeding Set-Up

Both areas are prepped similarly for breeding. Other species of birds are relocated out of their exhibits during their breeding season, to allow the plovers to breed successfully. Only a single pair has been set up in our enclosure, although other zoos have reported multiple pairs in larger areas. An adjustable electric heat bar (Fig. 3) is set up in an open area of the exhibits. The height of the heat bar is adjusted until the sand reaches 115F and is set with a timer for a 12 hour cycle. Breeding set-ups are prepped in December and remain until the end of chick rearing. The plovers will lay 2-3 eggs in different areas near the heat bar. Both exhibits are monitored on a closed circuit video system.

Figure 3. Heat bar set-up in the Bird World exhibit



## Incubation to Hatch



All eggs laid in the exhibits are removed for artificial incubation and replaced with dummy eggs. Eggs are placed in bowls with moist sand (Fig. 4) and partially buried to mimic natural conditions and also to prevent any breaking of these thinly shelled eggs. Dry temperature for the Incubator is 99.5F, 90F on a wet blub.

External pip to hatch is approximately two days. The chicks are precocial and active from day one. It is preferred to give them back to the parents, however we have had good success hand rearing these plovers. Their diet remains the same throughout the year, however with rearing chicks all items are finely chopped adding extra bugs and pinkies, offered twice daily.

Figure 4. Setting the eggs for the incubator

## Denver Zoo Lets Mother Nature Do the Work

We're screening the Egyptian plover exhibit to provide private breeding and nesting opportunities to minimize disturbance for this sensitive species.



*In the wild, the sun provides warmth for egg incubation. Birds cool the nest and eggs using breast feathers that have been dampened in nearby water.*



*Chicks hit the ground running the day of hatch – following their parents for food and protection. If intruders approach, chicks become silent and motionless. They are quickly covered with sand to be camouflaged.*



*Birds threaten intruders to the nesting area with loud vocalizations and threat displays.*

Denver Zoo was the first North American zoo to breed this species in captivity in 2000. In 2009 keepers used surrogate parents at our Avian Propagation Center to successfully raise a chick from an egg produced by the pair of Egyptian plovers in this exhibit.

Figure 2. Wall graphic added to the Bird World exhibit during breeding season

## Keeping & Breeding Southern Lapwings

By: Fred Kromm, Primary Aviculturist



Southern Lapwings have been a part of Tracy Aviary's collection since the 1990s, and are a favorite with both guests and staff due to their loud calls. Our birds show little fear of people and make great display birds in any exhibit they are placed in. They get along well with many species, including: parrots, doves, cuckoos, tanagers, finches, sunbitterns, and tinamou.

These birds frequently build nests, which are a shallow scrape in the ground lined with small bark chips and pebbles; ours have gotten creative and sometimes add other things to their nests like food pellets! Nests have been built everywhere: on-exhibit and in holding, near water and away from water. Eggs have been laid throughout the year, with 3-4 eggs being the typical clutch size. The male frequently incubates while the female defends the nest, however the female will occasionally incubate. The male sometimes performs behaviors to distract keepers from the presence of the female on the

nest, including a crouching posture very similar to a bird brooding chicks.

In March 2012, we let our pair raise a clutch on-exhibit in our South American Pavilion. Four eggs were laid, with two chicks hatching about 4 weeks later. Both parents were very attentive of the chicks, actively defending them from cage mates and brooding the chicks when they left the nest. Bloodworms, mealworms, and Natural Balance Meat-eating Bird diet (MEB) were preferred food items for the chicks. The chicks remained with the parents for about 3.5 months until displacement was observed towards the chicks when the pair re-nested, and the chicks were relocated.



We currently have our breeding pair in South American Pavilion, and a juvenile female in a walk-through exhibit in our Destination Argentina area. Our laying female is still going strong at 27 years old, producing multiple clutches every year and being as sassy as ever. Next time you visit Tracy Aviary our lapwings will be sure to say hello!

## Breeding Cape Thick-nees at Dallas Zoo

By: Alexandra Gilly, Senior Keeper, Dallas Zoo

For 6 years, the Dallas Zoo housed one lone male Cape Thick-knee (*Burhinus capensis*) on exhibit in the A. D. Martin, Sr. Forest Aviary. This exhibit is a walk-through public aviary housing more than 100 birds of all types and sizes. Visitors can find themselves nearly nose-to-beak with some of the more tame residents, or for those less adventurous,



observe the breeding and nesting behaviors of many of the residents of the aviary.

In 2013 the Dallas Zoo acquired a female Cape Thick-knee to pair (and hopefully breed) with our lone male, Sticks. After receiving a clean bill of health from our veterinary staff, our female Cape Thick-knee was moved into a stall beneath the aviary to introduce her to the male, housed temporarily in the next stall. To say it was a successful introduction might be an understatement. After three days of apparent displays (tail fanning, dropping insects at the shared wall), the two were introduced within the same stall. They immediately approached one another and became nigh-inseparable. Sticks would regularly approach the newly-christened “Stones” and drop fuzzy mice or pinkies at her feet. She graciously accepted.

Within three weeks the two were released on exhibit, quickly established a territory and became very protective over their space. The birds were introduced in early March. By late July regular displays were observed between the pair and in August nest scrapes were dug out in the ground in two locations. In early September, Stones laid her first egg on exhibit, followed by a second two days later at the second nest site. Dummies were placed at each location to encourage incubation, but (potentially) due to the large size of the exhibit and space between nest sites, neither Sticks nor Stones incubated the eggs.

In February 2014, while in an off-exhibit holding yard, the pair began displaying regularly and by March a new egg was laid in a new nest scrape, followed by a second egg 3 days later. Both Sticks and Stones regularly tended to the eggs. After 26 days, the eggs hatched and two healthy chicks emerged under the watchful eyes of both parents. One day after hatching the chicks were already taking worms from Stones, even if they weren't the most coordinated! Dietary preferences ran strongly towards insects and as they grew they developed a taste for chopped pinkies as well. Both chicks grew quickly and after just 2 months, two young males (Pebbles and Twiggy) were moved with parents Sticks and Stones back to the Forest Aviary where it all began.

## RESEARCH

### American Avocet Migration Study

By: Jennifer Evans, Curator of Exhibit Collections, Tracy Aviary

Researchers in Utah and Mexico have been studying and tracking the migration of the American avocet for many years now. This has been low-tech research, capturing, banding and hopefully spotting banded birds again at the other end of their migratory journey. Now, Dr. John Cavitt of Weber State University is the first person to track American avocet migration using satellite telemetry.



Cavitt and his team captured eight avocets and placed the small transmitters on the birds' backs. The transmitters send a signal that is received by the ARGOS satellite network. The network can determine the location of the trackers and download information from them anywhere in the world.

The transmitters have a solar battery and will last from two to five years. In addition to location, the transmitters also measure temperatures and activity of the birds.



Those tiny little transmitters don't come cheap. At \$3000 each, Dr. Cavitt did not want to find out after an avocet had flown away that the transmitter wasn't up for the challenge. That is where one of Tracy Aviary's three American avocets came into play. Dr. Cavitt requested that his team try out one of these transmitters on our birds. While we fully wanted to support the project the thought of losing an expensive piece of equipment in the bottom of a natural pond was not appealing. Fortunately, dummy transmitters were available so the project went forward.

Dr. Cavitt and his team came to Tracy Aviary one afternoon to attach the transmitter. The goal was to have a unit still attached and working after 24 hours. Aviculturist caught an avocet and researchers got to practice their attachment technique. Once released we collectively held our breath for all of 30 seconds. That is about when the transmitter fell off. The bird was recaptured, adjustments made, and...success! The transmitter stayed on. The bird bathed, slept, ate and interacted with other birds. The following day the transmitter was right where it belonged, and the avocet was no worse for the wear.



Between May 31 and June 27 2014 8 transmitters have been attached and data is trickling in.



# When Do Alcids Molt? Data From Captive Alcids



Tasha J DiMarzio  
Alaska SeaLife Center, 301 Railway Ave, PO Box 1329, Seward, AK 99664

## Introduction

- The Alaska SeaLife Center (Figure 1) houses five species of Alcids: Horned Puffins *Fratercula corniculata* (HOPU), Tufted Puffins *Fratercula cirrhata* (TUPU), Common Murre *Uria aalge* (COMU), Pigeon Guillemot *Cepphus columba* (PIGU), and Rhinoceros Auklet *Cerorhinca monocerata* (RHAU).
- Captive birds were housed in an open air aviary with natural lighting. The salt water diving pool is 21.5 feet deep raw seawater.
- The captive birds have shown similar breeding cycles to birds in Resurrection Bay, Alaska.
- Molting occurs annually and is energetically demanding.
- Little is known about the timing of molt in Alcids due to the remote locations they inhabit in fall and winter.
- The captive flock provided the perfect opportunity to document molting patterns and compare data among five species.



Figure 1. Alaska SeaLife Center Seabird Habitat



Figure 2. 9<sup>th</sup> Primary Measurements taken using a caliper

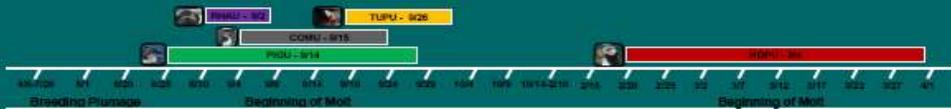
## Methods

- Daily plumage observations were conducted throughout 2010.
- Dates of individual primary feather loss were observed. Day 1 of re-growth was defined as complete primary feather loss.
- New primary feather lengths were measured opportunistically. To minimize handling stress, measurements of the right 9<sup>th</sup> primary were taken using a caliper. Each measurement was obtained by placing one point of the caliper at the proximal end of the feather where it emerges from the follicle and the other point extending to the distal feather tip (Figure 2).
- Two classes of nonlinear growth curves were fit to data points (Gompertz (Gompertz 1825) and Logistic (Lotka 1925)) based on scatter plots of initial samples.
- Gompertz Curves Follows:  $a + b \cdot e^{-e^{-x}}$  While Logistic growth follows:  $\frac{k \cdot a}{a + (k - a) \cdot e^{-x}}$
- Where: a = intercept, b = asymptotic correction, k = rate of growth, and x = number of days into re-growth period.

- Average calendar day of total feather loss during flight feather molt.

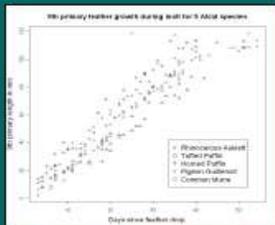
## Results

- Loss of ornamental breeding plumage and bill cere for TUPU during molt.

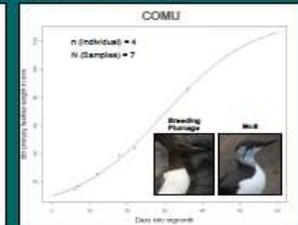
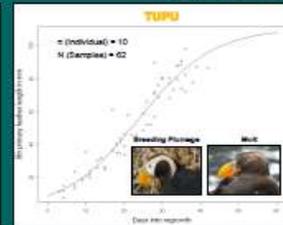
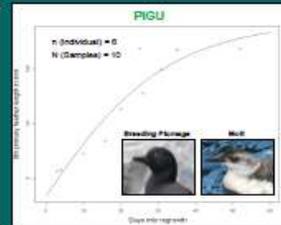
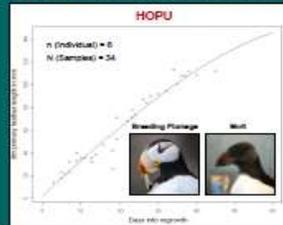
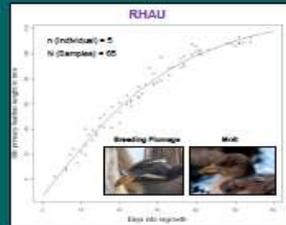


## Gompertz Growth Curves

## Logistic Growth Curves



Scatterplot of observed 9<sup>th</sup> primary feather lengths for all samples (N = 178).



Variable	Gompertz Growth Model			Logistic Growth Model	
	RHAU	HOPU	PIGU	TUPU	COMU
a	-97.10 (3.75)	166.90 (50.46)	-106.92 (23.98)	8.82 (1.68)	9.96 (1.05)
b	229.02 (6.34)	446.16 (130.00)	252.33 (47.53)	0.10 (0.013)	0.09 (0.010)
k	0.05 (0.0035)	0.02 (0.0072)	0.05 (0.022)	110.84 (10.71)	135.74 (21.21)

Table 1. Mean (SE) values for 2 classes of nonlinear growth models fit to five species of Alcid birds to describe 9<sup>th</sup> primary feather re-growth during molt.

\*all parameter values were significant at  $\alpha = 0.05$ .

## Discussion

## Future Direction

- We determined growth curves that could be implemented in both field and captive studies.
- To our knowledge this is the first time complete annual molting patterns have been examined for these 5 species.
- Factors that could effect re-growth rate are: diet, stress, and ambient weather conditions.
- Reproductive status and success also could effect the onset of molt. For example, double clutching may delay the molt.

- Improve sample size to enhance model performance for COMU and PIGU.
- Collect data on individuals over multiple years to determine interannual variability and investigate sex and age class differences.

## Literature Cited

- GOMPERTZ, B. (1825): On the nature of the function expressive of the law of human mortality, and a new mode of determining the value of life contingencies. Phil. Trans. Roy. Soc. 182, 513-585
- Lotka, A. J. 1925. Elements of physical biology. Baltimore: Williams & Wilkins Co

Thanks to ASLC Avian and Vet Services department for help with data collection and special thanks to Chuck Frost and Pam Parker for their guidance.

## HUSBANDRY

### Introduction of Fifty-One Day Old Spotted Dikkop Chick to Parents

By: Kyle Loomis, Keeper 1 – Birds and Program Animal, Zoo Atlanta

Zoo Atlanta's current pair of spotted dikkops (*Burhinus capensis*) is considered one of the more genetically valuable pairs in the SSP. For this reason, successful breeding and rearing of chicks has been a high priority. While it is the bird department's preference to allow the parents to do as much as possible, sometimes it becomes necessary to artificially incubate and hand rear. This was the case for our only successfully hatched dikkop chick of 2014.

Our pair of spotted dikkops arrived in May 2012. After a successful breeding season in 2013, we were hopeful 2014 would produce the same results. Five clutches, beginning in January, were unsuccessful due to infertility, flooding, shell calcification issues, etc. However, the sixth clutch produced a fertile egg on April 29, 2014. We decided to pull and place the egg in one of our incubators to increase the likelihood of success. The parents were provided with a dummy egg to incubate.

The chick hatched on May 24 after a twenty-six day incubation period. We moved the chick to an AICU unit for hand rearing. The goal was to attempt to not imprint the chick any more than necessary. Keepers took turns in the hand-rearing process which included regular cleaning, scheduling feedings, and exercise. The chick grew rapidly and quickly outgrew its AICU unit. After a two week stay in a holding cage at the propagation center, we began to toy with the idea of a structured introduction to his parents. At this point we realized that, despite best intentions, the chick was significantly imprinted on humans. The chick, being largely self-feeding and nearly fully feathered, was assessed to be healthy enough to endure the possible stress of an introduction.

As it happened, the adult pair of dikkops had laid another infertile clutch in mid-May. We decided this would be a good time for an introduction since the parents were still incubating and, if the eggs had been fertile chicks would have been hatching. On June 14, the fifty-one day old chick was taken to the parents' exhibit and set up inside the holding building. The building was attached to an outdoor howdy in the exhibit itself. The howdy, made of 1" x 1" weld mesh, had approximate dimensions of 2' tall, 2' wide, 18" deep. The chick almost immediately went outside into the howdy. The parents, especially the male, quickly investigated and within minutes they became defensive of the chick through the mesh. By the next day both parents began spending much of their time around the howdy trying to guard the chick. We were delighted to see the parents were so accepting of the situation.

We removed the howdy eleven days later based upon the positive interactions that we had observed. The possibility to remove it earlier was available, but we felt it was best to wait a few more days. The adult pair immediately took over full parental duties such as guarding the chick from the keepers and offering food from their beaks. Within days the chick was eating from the partially hidden diet bowl and also learned how to catch live minnows in a shallow bowl. After being released into the exhibit, the chick would still approach keepers when servicing the exhibit, but stopped doing so after about two weeks. The overall introduction was smooth and successful and in the future we suspect that this pair would act in a similar way even if the timing of their breeding cycle was less perfect.

## PROGRAM

### Black-neck Stilt Program Update

By: Carmen D. Murach

I am in the midst of assessing wants & needs for the upcoming breeding & transfer plan (and making sure the studbook is accurate). Here is the latest:

Although a few institutions had successful hatches over the last 2 years and others have seen progress towards reproduction, the captive Black-necked stilt (*Himantopus mexicanus*) population is declining. The current

population of 51 (30.20.1) individuals includes 12 post reproductive birds. This compares to 66 (35.28.3) birds, only 6 of whom were age excluded, in February of 2012. The PMC produced a Population Analysis & MateRx in 2013 to assist with re-evaluating transfer recommendations as the population changed between formal planning sessions. Hopefully, some of the recent matches will result in more hatches in the coming year.

Several birds in the population are currently unpaired and awaiting mates and/or companions. There is a waiting list of institutions interested in adding the species to their collections but, unfortunately, not enough birds to go around at this time.

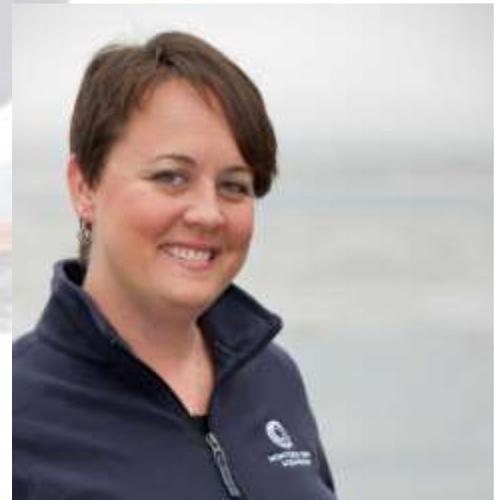
A couple of promising leads on rehab birds did not work out - both birds died before arranged transfers were completed. Relationships developed with the rehabilitation facilities involved may help the captive population in the future as both were excited about an opportunity to help the SSP. I have reached out to many rehab facilities within the breeding and migration range of this species but would greatly appreciate anyone with contacts in the rehab world to let them know that we can provide good homes for non-releasable birds.

## TAG UPDATES

### NEW Charadriiformes TAG Education Advisor

Hello everyone!

I recently joined the Charadriiformes TAG as its Education Advisor. I have been working around shorebirds and seabirds for the last 18 years at the Monterey Bay Aquarium. I started as a high school docent and worked my way up to volunteering with our aviculture team over the years. I graduated from University of California Santa Cruz (go slugs!) in 2002 with my B.S. in Marine Biology. I completed a husbandry internship at the Aquarium after my graduation in 2002 and now work with our interpretation staff as their science and climate change specialist. The birds have always been my favorite animals at the Aquarium (even though I get weird looks from co-workers and guests alike). There is a very special place in my heart for snowy plovers—small but mighty!



I am learning more about the work that is going on around the country to educate the public about shorebirds and their habitats. There is so much amazing work toward preserving the threatened species. As part of my role as Education Advisor, I hope to help make the messages about shorebird conservation more prominent in my own facility and facilitate greater communication, interpretation and education across the many facilities I interact with. Here's to inspiration and through it conservation!

Cheers!

Sarah-Mae Nelson  
Guest Experience Interpreter, CIG, CIT  
Climate Change Interpretive Specialist  
Monterey Bay Aquarium

## Shorebirds & Alcids Animal Care Manual

The Shorebirds ACM is completed and posted. This document can be viewed on the Charadriiformes TAG animal program page on the AZA website. The Alcid ACM is in the review process.

## Avian Scientific Advisory Group Species Fact Sheets

Black-necked Stilt, Spotted Dikkop and Inca Tern fact sheets have been posted to the Avian Scientific Advisory website and more will be coming soon. The ASAG fact sheet section also includes EAZA Gull information.

## American Avocets Egg Collection Update from Monterey Bay Aquarium

The Monterey Bay Aquarium is still working through permitting issues to collect American Avocets eggs to help boost the AZA population. The population in 2013 was 5.1 American Avocets according to ZIMS the current population is 3.1 in two institutions.

**LIKE the Charadriiformes TAG on FACEBOOK @  
<https://www.facebook.com/shorebirdTAG>**

## 2013-2014 Breeding Season Pictures



Inca Tern - Lincoln Park Zoo



Spotted Dikkop (chick is from wild-caught parents!!!!) - Tautphaus Park Zoo



2014 Feeding Parents – Sea World San Diego



Hours old Atlantic puffin chick – Sea World San Diego



Tufted Puffin Weigh Day – Sea World San Diego



Kittiwake Chick – Alaska SeaLife Center



Common Murre chick – Cincinnati Zoo

**The Charadriiformes TAG would like to give out a HUGE THANK YOU to all who helped contribute the second newsletter!!**

If you have any ideas for next year or are interested in writing an article please contact Cody Hickman at [hickmanjc02@gmail.com](mailto:hickmanjc02@gmail.com).