



The Shorebird

The AZA Charadriiformes TAG'S Newsletter 2015

Inside this Issue:

TAG Mission/ TAG Committee Members/ Program Leaders
AZA Charadriiformes TAG

TAG UPDATES

NESTING & HAND-REARING

Nesting Attempts of American Avocets
Hand-raising Orphaned Killdeer and American Avocet Chicks
Challenges with Raising Spur-winged Lapwings

RESEARCH

Polymorphic Molt Patterns in Horned Puffins (*Fratercula corniculata*)

EXHIBIT

Smithsonian National Zoo – “Experience Migration”
Charadriiformes at Pinola Conservancy

CONSERVATION

Dinner with the Puffins
The Detroit Zoo Restores and Monitors Tern Habitat in Southeast Michigan

TRAINING

Alcid Training at Omaha's Henry Doorly Zoo & Aquarium

2015 PUBLISHED WORK

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
Treasurer: Stephanie Huettner, Omaha's Henry Doorly Zoo & Aquarium
Secretary: Cody Hickman, Brookfield Zoo
Hannah Bailey, Houston Zoo
Tom Schneider, Detroit Zoo
Debbie Zombeck, North Carolina Zoological Park
Anne Tieber, St. Louis Zoo
Colleen Lynch, Riverbanks Zoo
David Oehlar, Bronx Zoo
Robert Webster, Cincinnati Zoo
CJ McCarty, Oregon Coast Aquarium

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
Mark Myers, Spur-winged Lapwing, Woodland Park Zoo
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
Travis Garret, Egyptian Plover, Denver Zoo

AZA Charadriiformes TAG Update

Shorebirds & Alcids Animal Care Manual

The Shorebirds ACM is complete 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 are posted on the Avian Scientific Advisory website, and more will be coming soon. The ASAG fact sheet section also includes EAZA Gull information.

TAG RCP 2016

The Charadriiformes TAG will begin working on the 2016 Regional Collection Plan soon. We will be contacting IR'S later this year.

Charadriiformes TAG MART

The first time the Charadriiformes TAG participated in the TAG Mart at this year's 2015 Mid-year. We had a successful year selling hand-crafted jewelry that was designed by Cindy Pinger the Charadriiformes TAG Chair. All proceeds will go to shorebird conservation.



NEW TAG MEMBERS

The Charadriiformes TAG would like to welcome a new member to the group. Stephanie Huettnner from Omaha's Henry Doorly Zoo and Aquarium is the TAG's new Treasure. We are excited to have her aboard. We also like to introduce our newest steering committee member – CJ McCarty from Oregon Coast Aquarium.

OUTSTANDING PROGRAM LEADER NEWS

The Charadriiformes TAG would like to recognize Sunny Nelson from Lincoln Park Zoo. Sunny has done a fantastic job as program leader for the Inca Tern SSP. She recently received recognition for "Magnificent Management of Mate RX for Program Success" for her management of the Inca Tern SSP program from the Population Management Center. Currently, the population is roughly 230 birds.

BREEDING

Nesting Attempts of American Avocets

Mindy Rabideau, Primary Aviculturist

MindyR@tracyaviary.org

Tracy Aviary

Tracy Aviary is home to 2.1 American avocets (*Recurvirostra americana*). These birds, along with other native wetland birds, are housed in our large walk-thru Kennecott Wetlands Immersion exhibit. In 2008 we received a young female (hatched that spring) from a local rehab institution. 2013 saw the addition of two males (from El Paso Zoo), currently aged 24 and 18 years, to our wetlands exhibit with the hopes of breeding this species.

By the time the males arrived in 2013, it was too late in the season to expect any breeding behavior. As spring 2014 arrived, we were hopeful to see breeding behaviors. March and April saw the males hanging out together as usual with no interest in the female. However, in late May, the younger male began hanging out with the female on occasion and they built a nest together. Copulation attempts were observed, but no eggs were produced. The pair did not spend much time together this spring and the two males were usually observed together.

Around the time breeding season 2015 started, the older male developed an eye issue that necessitated his removal from the exhibit for treatment. Whether it was the absence of the other male or their second breeding season together, the younger male and the female formed a pair this year. They built a nice nest, which was subsequently taken over by our long-billed curlew. Unable to drive the larger curlew off, they built a second nest on the other side of the exhibit. Beginning in mid-April, the pair began nesting, triple clutching this spring. The first clutch had two eggs, the second and third with three each. If we did not pull the eggs close enough to when the incubation period was over, the pair would begin to destroy them. Perhaps due to the age of the male or the inexperience of the pair, we did not see any signs of fertility this season. The nesting of the avocets was quite popular with visitors. The male exhibited good defense of his nest, often attacking keepers doing morning rounds. Due to over-inquisitive nature of some visitors and the close proximity of the nest to the boardwalk for visitors we stationed staff and volunteers in the exhibit more than usual, taking extra care to make sure someone was there during busy times to keep the pair and their eggs safe. American avocets are wonderful shorebirds and are popular with our guests as well as our staff. We hope to have success with this wonderful species in upcoming breeding seasons.

Hand-raising Orphaned Killdeer and American Avocet Chicks.

Anysia S. Dickson and Linda D. King

Project Wildlife in San Diego, California receives Killdeer as orphans weighing between 8 and 10 grams on intake. One of the most important things for these young birds is warmth. We have found that the chicks need a direct heat source above and from below to keep them warm enough for the first few weeks in life – standard forced air brooders do not achieve this.

For these small chicks we start out with a storage box as shown in *Figure 1*. The inside of the plastic top is cut out and 1/4" hardware cloth secured over the cut out opening. Larger (22-24 grams) 1 week old chicks are upgraded to a larger storage box of the same design (*see Figure 2*).



Figure 1: Shallow Brooder Set Up (23"L x 16 1/4" W x 6" H).

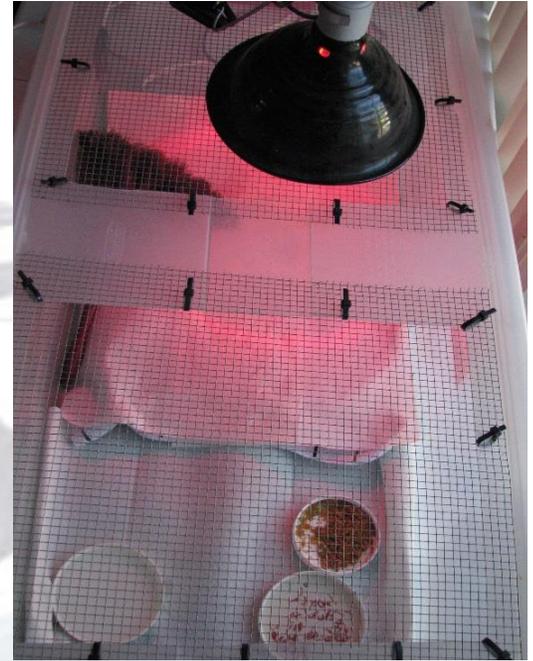


Figure 2: Deep Bigger Brooder Set Up (34 5/8" L x 18 3/4" W x 12 1/2" H).

At one end of the brooder we place a heating pad on low (one that does not have a safety shut off). On top of the wire lid is a 100 watt infrared heat lamp. At the other end there is food and water. For comfort the temperature in brooder box has about a 10°F range from the food end to the heat end. In the enclosure we offer a place to hide or cuddle (e.g. a feather duster or a stuffed animal).

As a substrate (while indoors) we use puppy pads or small towels covered with paper towels.

For food we offer a shallow lid with *Hill's Ground Feline Science Diet Original* sprinkled with mini-mealworms dusted in Calcium Carbonate. In another lid we melt cubes of bloodworms and brine shrimp in water. This needs to be changed at a minimum every 2 hours due to spoilage. Also, we offer a shallow dish of fresh water for them to drink.



Every day the chicks get time in the sun for 15 minutes so they can naturally produce vitamin D. Be sure they have

some shade to move into and make sure they do not overheat. *Figure 3* shows chicks during sun time.

Figure 3: Singleton California quail have been housed with Killdeer as buddies. We have also housed single Killdeer with multiple California quail to prevent imprinting.

Here is a breakdown of housing based on the chicks weight see *Figure 4* and approximate age:

- Less than 20 grams (1st week): housed in the shallow brooder with a temperature range of 100-110°F. Sometimes the brooder end is even hotter than 110°F if ambient temperature is high. Heat above and below.
- 20-40 grams (~1-2 weeks): housed in the larger deeper brooder and the temperature ranges 90-100°F. Heat above and below.
- 40-50 grams (~2-3 weeks): the heat under the chick is discontinued the temperature ranges 80-90 °F. At this age we also upgrade to medium sized mealworms.
- 50-60 grams (~3-4 weeks): all heat is discontinued as long as ambient air temperature is above 70°F. Also at this age only offer the brine shrimp/bloodworms in water once a day for a couple hours to wean the chicks prior to going out to an aviary.
- 70-80 grams (~4-5 weeks): the birds are moved to an aviary with a shallow pool and grasses for them to hide behind. The ground Science Diet with mealworms is still offered, along with mealworms and crickets scattered directly on the ground to encourage foraging.

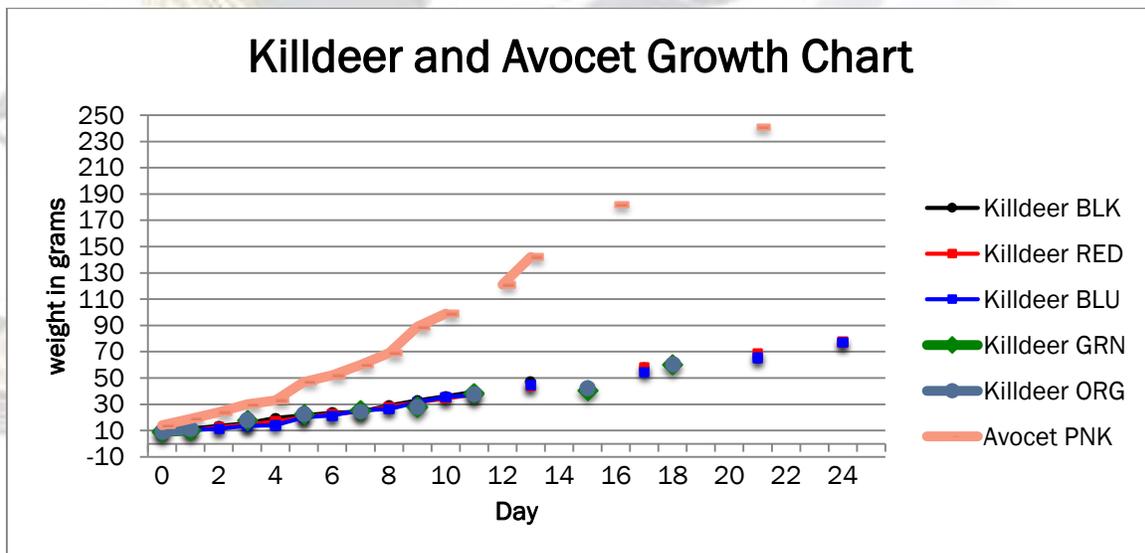


Figure 4: Killdeer and American Avocet Growth Chart

After 2 weeks of perfecting flying the birds are released back into the wild.

For Avocets the weights are higher, but these methods were applied to hand-rearing Avocets and gave us good results as well. We found they are voracious eaters, so they are offered fresh slivers of raw fish throughout their time in our care. The fish needs to be changed every two hours due to spoilage. They also love bathing at a younger age, so offering a larger shallow dish for bathing while sunning is appropriate.

Anysia S. Dickson is a volunteer Wildlife Rehabilitator and the head of Project Wildlife's Songbird team at Project Wildlife in San Diego, CA

Linda D. King is a volunteer Wildlife Rehabilitator at Project Wildlife in San Diego, CA

Challenges with Raising Spur-winged Lapwings

Sydney Oliveira and KC Donaldson, Bird Keepers

Saint Louis Zoo

Here at the Saint Louis Zoo, the bird department allows our birds every opportunity to incubate and rear their own young but sometimes, despite their best efforts, we have to intervene. The latter was the case with our Spur-winged Lapwings (*Vanellus spinosus*). This is a relatively new species for the collection and 2015 marked the first year of successful reproduction for the Saint Louis Zoo. However, at 20 days of age the chicks started developing clinical symptoms consistent with metabolic bone disease. Below we will discuss how we diagnosed them, treated them and what we can do in the future to prevent this from occurring again.

The pair is housed below Carmine Bee-eaters in a habitat that is designed to resemble an African riverbank. It features several skylights that provide natural lighting, a shallow stream to encourage bathing and foraging, a substrate of rock and clay, and a variety of live and artificial plants. The walls are comprised of gunnite "rock" work complete with nest cavities for the bee eaters. (Refer to image 1)

The birds started searching for a place to nest in early June 2015. Within a week, they had a small scrape and a few days later had 2 eggs. After a twenty-nine day incubation, keepers reported seeing two chicks brooding under parents and periodically foraging. We offered a diet consisting of ¼" chilled live crickets, thawed blood worms, small pieces of meat diet, flamingo bits, chopped mealworms and waxworms, and finely chopped smelt and capelin dusted with calcium carbonate. The chicks appeared to favor the ¼" crickets. The movement of the crickets seemed to stimulate them to eat. The chicks were growing and developing normally for the first 20 days, then on day 21 we saw a slight limp in one of the chicks. Less than 24 hours later, that chick was barely able to walk. Upon closer examination we found that the chick's legs (tarsometatarsus) were turning slightly outward just below the ankle or intertarsal joint. Despite its inability to walk, the chick appeared very alert and maintained a healthy appetite. (Refer to images 2,3,4)

Vet staff performed a physical examination and after several discussions they diagnosed the chick with having symptoms consistent with metabolic bone disease. Keeper staff took UV Meter readings from the habitat and discovered that the skylights did not allow any natural UVB light in. We found that UV output can diminish as the skylights age, as we had raised other plovers with no issues in our indoor habitats in the past. The chick was initially given a Vitamin D injection. The injection was given on Day 22 in the AM and at that time, the chick could not stand. By the following afternoon, the chick was able to stand and move around for brief periods of time. Its legs were still visually bowed but it did not seem to affect the chick's mobility. The chick was eating well so an oral Vitamin D supplement (Enfamil D-Vi-Sol) was provided in place of the injection. The supplement was coated on chilled ¼" crickets. Then, as the chick grew and was able to eat larger crickets and waxworms, we were able to inject the supplement into a single cricket or waxworm.

Following the addition of the D-Vi-Sol, the chick was provided with a supplemental UVB light bulb (48" Zoo Med T5HO (high output)). UV readings were taken with a UV meter to see what height would give the proper UV reading of 20-50 μ w/cm² which was decided by vet staff. Higher readings could result in damage to the chick's retinas. 16-20" above the chick's legs gave the correct reading. We were measuring from the UVB light to the highest un-feathered area on the bird, which in this case, was the legs. Based on our UV meter readings, the light was hung 18" from the ground in the enclosure. The light was turned on twice daily for 15 minutes each time. Once the chick was about 2/3 adult size (around 50 days old), we stopped offering the D-Vi-Sol but continued using the UVB light for 15 minutes twice daily until the chick was fully grown. The chick was encouraged to stand underneath the light by feeding or scattering insects below it. We also placed the UVB light near a heat lamp since these plovers are attracted to hot spots.

When the chick was pulled for hand rearing, it was initially housed in a small wooden brooder box that measured 24" long by 18" wide by 12" tall. The box had a mesh screen that sits on top of it and a wooden lid that then holds the screen in place. We covered about 2/3 of the screen with the wooden lid to allow the box to stay at a warmer temperature. A 250 watt infrared heat lamp was hung around 6-12" from the top of the box. The light was hung with plastic chain and could be raised or lowered to achieve the desired temperature. We used carpet covered by huck towels as the substrate. The chick was also given a small mirror and a feather duster to mimic brooding and socializing with their parents. We offered food and water in a small shallow plate that was 4" in diameter which was sufficient until day 15. By that time, the chick was around 50g and getting too tall for the box. While the chick was housed in the brooder box, we were able to place the UVB light on top of the brooder for the 15 minutes twice daily and then removed it for the remainder of the day.

Once the chick outgrew the small brooder box it was moved to a small enclosure in the off exhibit area of the birdhouse. The enclosure was 10' long by 4' wide by 7' tall. We hung a 250watt infrared heat lamp in the front and back of the enclosure at around 14-16" from the ground. We used dri dek matting covered in mulch as a substrate. We found that plovers need a variety of textures and cushioning from the concrete floor to prevent foot issues such as bumbles. To continue the UVB light therapy, the light had to be hung about 20" from the ground in the enclosure. To accomplish this, we suspended the light near a heat lamp. The chick was still fed in a small plate but water was given in a large shallow plate anywhere from 8-12" in diameter. The 8" plate was adequate, but as the chick grew we increased to a 12" plate to allow the chick to bathe. Once the chick was 115g or about 2/3 adult size, it was moved to our Nursery building and given access to a small shallow pool.

Even though the off exhibit enclosure can be suitable for plovers and other wading birds if needed, we prefer to move waterfowl and wading birds to our Nursery. The Nursery is equipped with small pools that have continuous running water. This is more hygienic and allows the chicks to wade and forage in the water more naturally as opposed to a dish. We were able to use dri dek and enka matting for substrate as before, but no mulch was necessary. By that time the chick was fully feathered and comfortable at room temperature, so no heat lamp was required.

After raising this chick, we reviewed our Spur-winged Lapwing protocol and made adjustments to prevent future cases like this one. Since the skylights do not provide any natural UV exposure, any future chicks hatched in this exhibit will be pulled on Day 5 to be hand reared. Day 5 was selected since most chicks are self-

feeding at this age and therefore have a higher chance of survival. Once pulled, the chicks will be put on a Vitamin D regimen along with supplemental UVB light treatments. This change in protocol paid off. In less than a month after the first two chicks hatched, the plovers re-clutched and hatched out a single chick. It was pulled at five days and followed the D-Vi-Sol and UVB light treatment and the chick is currently adult size and thriving. We learned a lot from raising these plovers and look forward to hatching more out this next season with our successful protocol.



Image 1

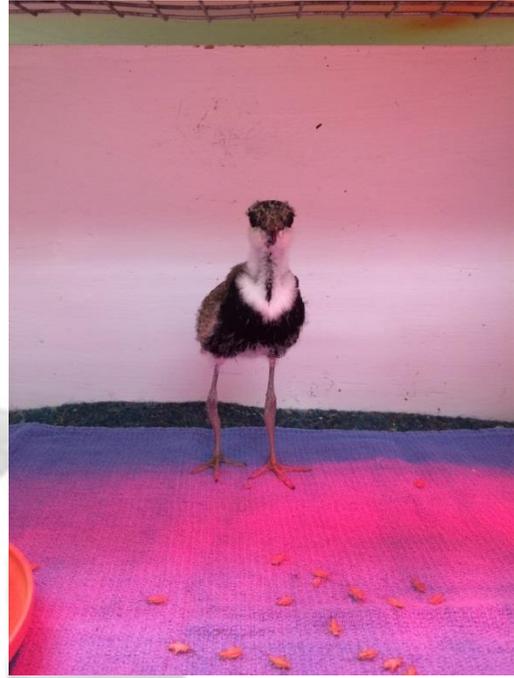


Image 2,3, & 4 (Day 22 in bucket/ Day26)



Day 26



Day 2



Day 4



Day 58

RESEARCH

Polymorphic Molt Patterns in Horned Puffins (*Fratercula corniculata*)

Melissa Vindigni, Seabird/Raptor Keeper 1

North Carolina Zoological Park

Though the molt pattern of many bird species is well documented, patterns in Alcids are largely unknown. Most Alcids molt outside of the breeding season when birds may not be near land and they are known for molting their flight feathers in a very short time, usually just a few weeks (Bridge 2005, Pyle 2009). What we do know about Alcid molts comes primarily from the study of museum specimens or birds that have washed ashore (Harris et al 2014, Pyle 2009).

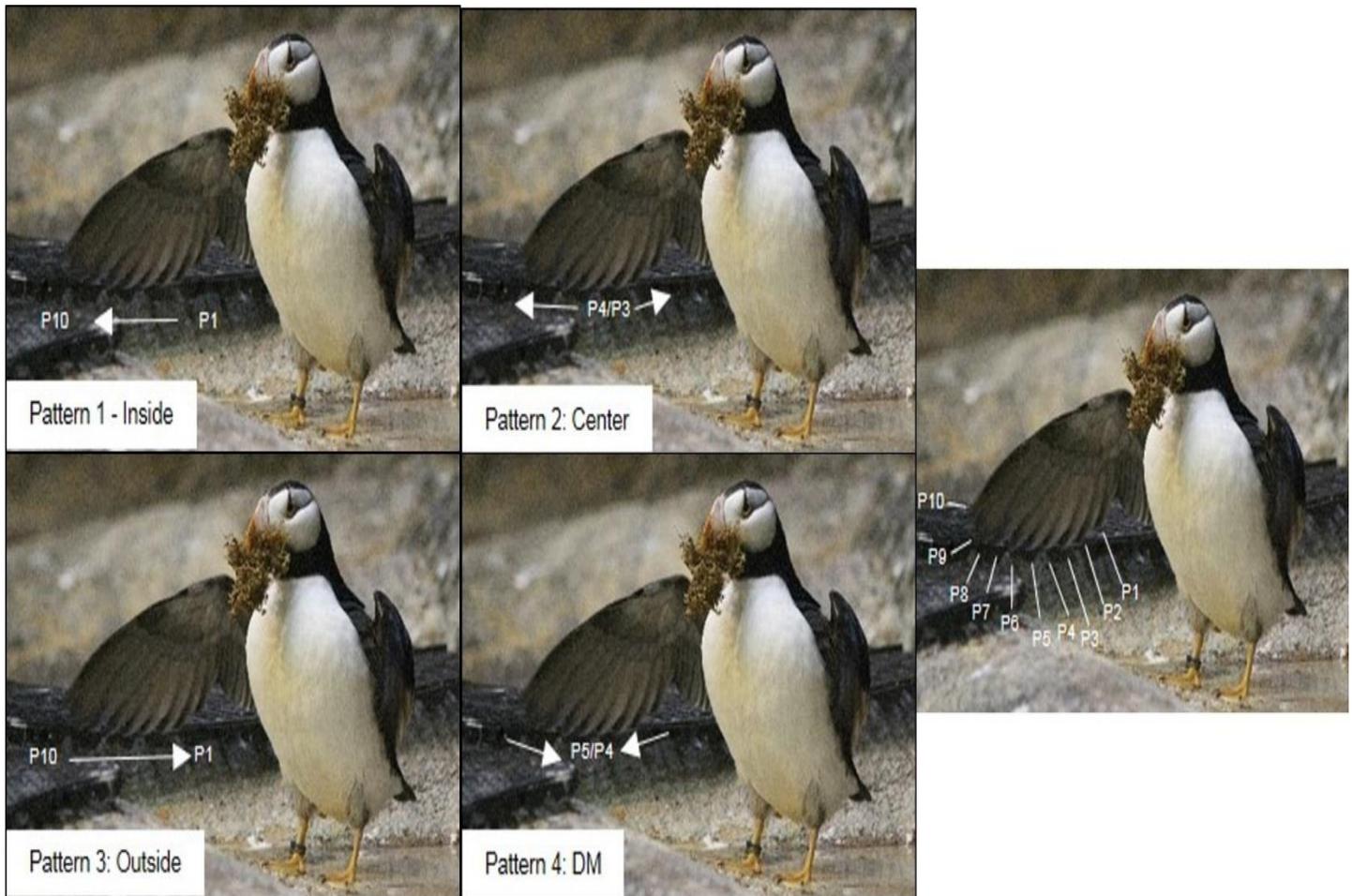
Puffins are not a common exhibit animal in North American zoo's and they are usually seen in small numbers (<15 individuals). The North Carolina Zoo has housed Horned Puffins (*Fratercula corniculata*) since 1994. Currently, we house 31 individuals (16 males and 14 females) of varying ages (<1 year to 32+ years). In 1998, keepers began recording when puffins started and finished dropping primaries. This was done purely through observation as birds are only handled for medical reasons. Keepers always assumed that puffins molted from P1 to P10 (medial to distal) and most birds in the collection did. But in 2005, keepers noticed 2 individuals were not following this "inside" pattern. Instead, both were molting from P10 to P1 (distal to medial). In 2007 a third individual was seen to have this "outside" pattern and was documented with that pattern consistently for several years.

Thompson and Kitaysky (2004) found 2 different molt patterns in Tufted Puffins: the "inside" pattern and a "center" pattern where birds molt from P5-P7 and progress distally and medially simultaneously. This paper prompted NC Zoo keepers to formally document molt patterns within our colony.

Every day, keepers observe the Alcid colony two times per day after morning and afternoon feeds. Typically a full census is done twice a week. During molt, census is done twice a day. Keepers identify each puffin, note if they have started or finished dropping primaries and, when possible, which molt pattern they are exhibiting. Due to the rapid pace at which puffins drop their primaries, some birds' patterns were unable to be identified. These birds were labeled as "unknown". A few birds in the colony are known to break or pull out their primaries. These individuals were not included. If there was a question about what pattern a bird had, a second keeper confirmed.

Keepers were able to identify molt pattern for 8 individuals 2 years in a row and for 3 individuals 3 years in a row. After 3 years we identified 4 different molt patterns within our puffin colony. 1) inside: molt from P1 to P10, 2) center: molt from P3/P4 to P10 and to P1 simultaneously, 3) outside: molt from P10 to P1, 4) distal medial (DM): molt from P10 and P1 to P4/P5 simultaneously. The most common pattern seen was the center molt.

Also, while most puffins had the same molt pattern on both wings and maintained that pattern across years, a few birds did not. At least 1 individual each year (3 individuals during the whole study) was seen to have different patterns on both wings, a phenomenon also seen by Thompson and Kitaysky (2004). However we also observed that molt pattern appeared to change between years in 3 individuals. In 2 birds, the patterns seen are very similar (center and inside) and can be difficult to differentiate if not noted early. The other bird showed two very distinct patterns: center and outside.



Overall, we were very excited to document these unique molt patterns. While we were hopeful of seeing both patterns noted in Thompson and Kitaysky (2004), we were not expecting to find a fourth pattern. In the future, we are hoping to continue monitoring molt patterns while sharpening our skills to better differentiate the center and inside patterns. We are also hoping to work toward determining if there is an underlying reason why certain puffins exhibit certain molt patterns.

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Pyle, P. 2009. Age Determination and Molt Strategies in North American Alcids. *Marine Ornithology*. 37: 219-225.

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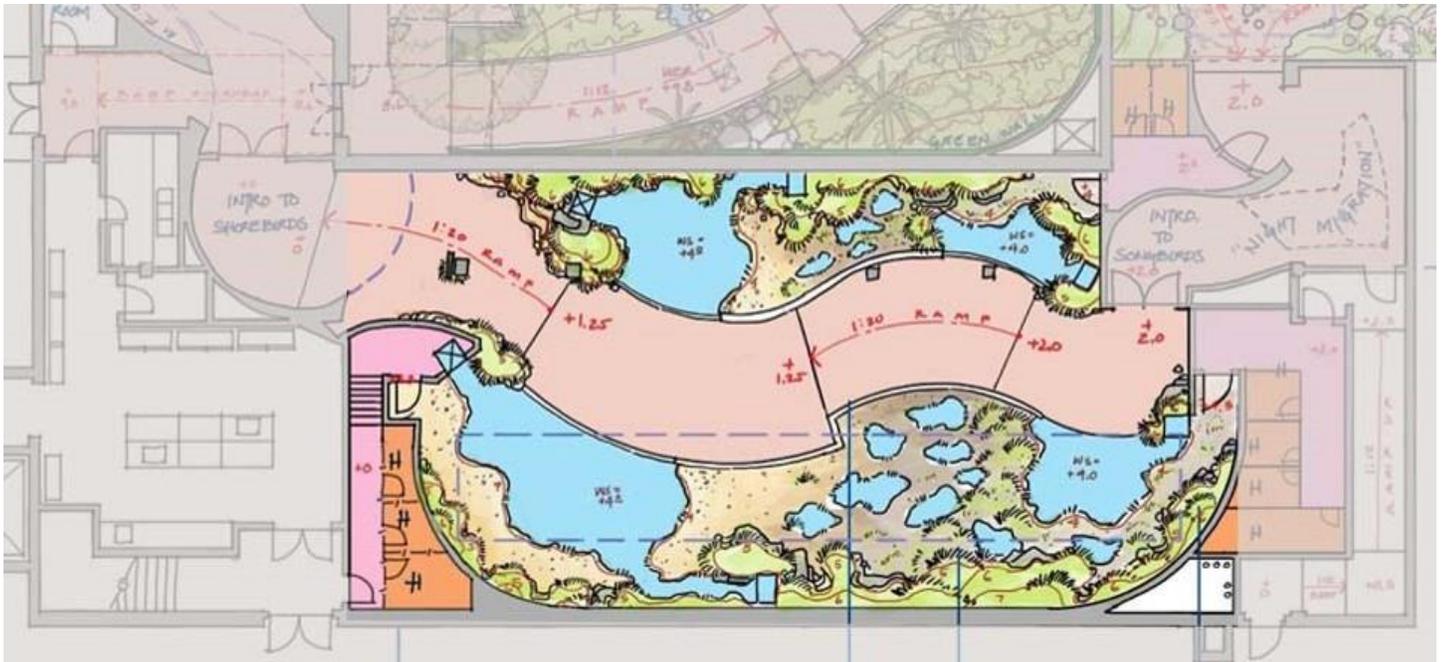
EXHIBIT

Smithsonian National Zoo – “Experience Migration”

Sara Hallager, Curator of Birds

National Zoological Park

Smithsonian Institution



The renewal of the Smithsonian National Zoo’s 1928 Bird House is a paradigm-shifting exhibition project which will broaden public access to Smithsonian science and collections. The project engages audiences in visitor-activated learning experiences that combine the resources of the Smithsonian Migratory Bird Center’s research with a correlated, revitalized animal collection. “Experience Migration” highlights the annual cycle and long-distance journeys of migratory birds in the western hemisphere, focusing on neotropical migratory songbirds and shorebirds. The story leads the visitor through phases of a migrating bird’s journey depicting key habitats for breeding, stopovers, and overwintering. The architecture of the Bird House will be transformed to offer multi-sensory, immersive experiences. The exhibit is projected to open in early 2021 following 24 months of construction.

Three walk-through aviaries will feature migratory and resident birds of the western hemisphere. One of the aviaries is the Delaware Bay Stopover. Delaware Bay is a major stopover site for shorebirds refueling in spring migration. It is one of only four estuaries in North America that supports more than one million shorebirds during migration. Delaware Bay is habitat to the world’s largest population of horseshoe crabs who arrive by the thousands on the beach in late spring/early summer to lay eggs which are rich in nutrients for the shorebirds.

Guests enter the largest ‘pitstop’ of a shorebird’s annual cycle, the Delaware Bay in Spring. Red knots, ruddy turnstones and other shorebirds are all around. Your vantage changes from a beach, with soft waves that wash and rebuild the sand, to pebbly mudflats. Interactives teach you that these birds have just flown thousands of miles from South America, will spend a few weeks in May along the coast of Delaware Bay to refuel and fatten up, and then prepare for their next journey north to the Arctic Tundra for breeding. A themed shoreline covered

in horseshoe crab eggs shows why this location is an essential refueling station/stopover for birds on their northward journey.

Learning Objectives and Interpretive Messages of the Delaware Bay Aviary

- Migratory shorebirds travel great distances between breeding and non-breeding grounds in response to seasonal changes in food availability
- Long-distance migrators, like red knots, are in steep decline and need study and conservation action
- The bird migration journey is perilous, spectacular and awe-inspiring.
- Understanding that the same bird lives in multiple places connects me to people in other parts of the world.
- Bird populations are indicators of the health of our environment, (so now is the time to study and protect them and their habitats).

Charadriiformes at Pinola Conservancy

Jacob Kraemer



Figure 1: Collared Pratincole

Over the last several years, Pinola Conservancy has taken an active role in the keeping and breeding of several species of Charadriiformes. Our core focus here is waterfowl, thus the majority of our enclosures have one or more water features within them. In most cases this makes them just as fitting of a home for wading birds. We have done a number of imports recently, both from private breeders in Europe as well as direct wild-caught birds, to either bring in new species that were not currently kept in this country or to help diversify the bloodlines of species that needed it. Pinola currently houses 12 different species:

Greater Painted Snipe (*Rostratula benghalensis*)

Collared Pratincole (*Glareola pratincola*)

African Jacana (*Actophilornis africanus*)

Egyptian Plover (*Pluvianus aegyptius*)

Masked Lapwing (*Vanellus miles*)

Blacksmith Lapwing (*Vanellus armatus*)

Spur-winged Lapwing (*Vanellus spinosus*)

African Wattled Lapwing (*Vanellus senegallus*)

Southern Lapwing (*Vanellus chilensis*)

Pied Avocet (*Recurvirostra avosetta*)

Senegal Thick-knee (*Burhinsus senegalensis*)

Peruvian Thick-knee (*Burhinsus superciliaris*)



Figure 2: Greater Painted Snipe Male

Figure 3: Greater Painted Snipe Female

Most are kept in community aviaries with other birds. We do keep some species in flocks, such as the collared pratincole. The polyandrous species, snipe and jacana, are generally kept 1 female to 2-3 males and are carefully monitored for aggression from the female towards the males. I have found Charadriiformes husbandry to be fairly easy. It can get cold in North Louisiana so care is taken during the winter months to accommodate some of the more temperate species with access to heat or by moving them to completely heated quarters over those months.

The main diet specifically offered here for waders is as follows:

Soaked Mazuri Insectivore Diet

Soaked Mazuri Parrot Diet

Soaked Mazuri Softbill Diet

Mealworms of various sizes

Super worms

Wax worms

Hornworms

Crickets

Finch seed mix

Since they are in community aviaries, they have continuous access to other food items as well and have been observed to readily take:

Mazuri Waterfowl Maintenance/Breeder

Mazuri Sea Duck Diet

26% Protein High-Pro Dog Food

Mazuri Gamebird Maintenance/Breeder

Various fruits and vegetables

We do hand-rear most species in the same rearing cubicles, sold by Leucopsis Products, that we use to hand-rear waterfowl. I give them access to a shallow dish of water right from the moment they leave the hatcher and are put into the brooder. I gradually increase the water area as they grow and they are offered a diet of soaked Mazuri soft-bill and Mazuri Insectivore with extra small mealworms and bloodworms fed twice daily. I have also let a few species of lapwings rear their own chicks to great success as they are very protective and attentive parents.



Figure 4: Masked Lapwing Chick Brooder Setup



Figure 5: Masked Lapwing Nest



Figure 6: Masked Lapwing In Aviary



Figure 7: Spur-winged Lapwing Chick In Aviary



Figure 8: Spur-Winged Lapwing With Chicks



Figure 9: Southern Lapwing



Figure 10: Southern Lapwing Nest



Figure 11: Southern Lapwing Chick

Our newest aviary, completed in February of 2015, was built not only with waterfowl in mind but waders as well. A shallow stream runs through the entirety of the aviary and this feature is highly sought after by the aviary inhabitants. With several nesting areas beside the stream, we look for this to be a very successful breeding aviary for waders in 2016.



Figure 12: New Aviary For Seaducks & Wading Birds

I would personally like to thank the Charadriiformes TAG for allowing us to participate in the programs that we currently are involved with and we look forward to continue working to increase the wants and needs for these amazing birds within AZA collections.



Figure 13: Masked Lapwing Defending Nest From Crawfish

CONSERVATION

Dinner with the Puffins North Carolina Zoological Park



With so many species of plants and animals struggling in the wild, zookeepers have become some of the strongest and most passionate advocates for conservation in our changing world. Keepers strive to educate the public about the plight of the animals in their charge, and to evoke excitement for ways to protect them. The Rocky Coast Bird exhibit at the North Carolina Zoo houses Horned Puffins, Parakeet Auklets, and Thick-billed Murres. The seabird keepers wanted to come up with a creative way to help fund a conservation effort surrounding Arctic seabirds and climate science, and that's when "Dinner with the Puffins" was born.

With the support of the NC Zoo and the NC Zoo society, Dinner with the Puffins began in 2013. It started out as a catered event in the seabird viewing area only, but has since developed into an all-inclusive tour of the "Arctic" incorporating all of the animal exhibits within the Rock Coast complex. It begins with appetizers and wine overlooking the Harbor Seal and California Sea Lion exhibit, then visit with our Peregrine Falcon, and on to dinner in the indoor seabird viewing area. Dinner includes a keeper talk and seabird feeding with a special visit from AJ the Horned Puffin, one of our trained Arctic

ambassadors, and a power point presentation about the purpose of the evening and how it supports conservation. After dinner, we visit our Arctic Foxes, then end our evening at our Polar Bear exhibit where we have dessert and the keepers deliver enrichment to our bear. This includes a keeper talk where we speak a little more about the struggles that Arctic wildlife is facing.

All of the funds raised thus far have gone to support Friends of Cooper Island, a nonprofit scientific organization which works to preserve and distribute its research for use by current and future researchers studying climate change and other Arctic phenomena.

Lead scientist George Divoky has been documenting his research on Cooper Island for over 40 years where he utilizes the resident population of Black Guillemots and growing population of Horned Puffins as indicator species in the Arctic as warming temperatures are causing changes in the sea ice formation. For more information about Friends of Cooper Island and ways you can help, please visit www.cooperisland.org

Dinner with the Puffins has happened each year since 2013 and has raised over \$3,800 for climate science research. The event not only benefits Arctic seabirds, but many different species of wildlife living in the Arctic ecosystem. We certainly love that we're able to create excitement and passion for the little seabirds that we care for, and to help them represent their wild cousins as fantastic ambassadors for their species. We hope to continue Dinner with the Puffins for many years to come. For more information about the NC Zoo and our commitment to conservation, please visit the NC Zoo Society at www.nczoo.com.

The Detroit Zoo Restores and Monitors Tern Habitat in Southeast Michigan

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Detroit Zoo

Michigan's lakes, rivers and wetlands support an abundance of birdlife. Common terns (*Sterna hirundo*), Forster's terns (*Sterna forsteri*) and black terns (*Chlidonias niger*) are neotropical migrants that are found in their Michigan breeding grounds from mid-April through mid-August. Common and Forster's terns are listed as state threatened species, and black terns are listed as a species of state special concern in Michigan.



Common Terns

Common tern colonies typically occur on islands and peninsulas with sparsely vegetated sand and gravel beaches, although artificially created sites also provide favorable nesting habitat. Common tern numbers increased significantly in the lower Great Lakes with the construction of numerous canals, piers and islands created from dredge spoils from shipping and other industrial activities in the 1940's and 1950's. During the years spanning 1960-1980, over 4,500 common terns nested on artificial sites along the Detroit River. The number of nesting pairs and colonies began to



decline by the 1970's due to habitat loss (mainly from high water levels, overgrowth of vegetation, and displacement by earlier-nesting ring-billed gulls), low productivity (mainly from predation of eggs and chicks) and human disturbance.

Since 2000, only two remnant populations remain on the lower Detroit River with approximately 135 to 300 nesting pairs observed annually. The colonies are located on the protection piers of two bridges, and although habitat improvements have been made, predation and overgrowth of vegetation continues to limit productivity at both sites. Predation from a nearby black-crowned night heron colony has also caused continual night time nest desertion.

In 2008, the Detroit Zoo partnered with the US Fish and Wildlife Service and the Detroit Water and Sewerage Department to restore a historically significant common tern habitat on Belle Isle Park, an island in the upper Detroit River. In the 1960's, this was one of the most productive common tern colonies in the lower Great Lakes with as many as 1,600 nesting pairs. The habitat was lost in the early 1980's due to human activity. The Detroit Zoo and its partners saw a unique opportunity to restore the habitat which is located on the end of a grass-covered dike and managed as part of the City of Detroit's municipal water intake.

Habitat restoration began in the fall of 2008. In 2009, common tern decoys and non-aggressive tern vocalizations were used to attract the terns back to the site. In 2010, a small group of terns were observed, and a dozen pairs began actively nesting in 2011. In 2012, two chicks fledged, followed by two years of heavy egg predation, with three chicks fledging in 2015. Egg predation continues to be the limiting factor at this site. Several measures have been taken to preclude and monitor predators, including the installation of electrified and snake deterrent fences, and the use of trail cameras.



The Detroit Zoo also monitors and maintains habitat for a common tern colony on a historical lighthouse located in northeastern Lake St. Clair, located between Lake Huron-St. Clair River and the Detroit River-Lake Erie. Isolated from the mainland, this colony of over 100 breeding pairs has the potential of being one of the more productive colonies in the Upper Great Lakes because it is secure from storms, human disturbance, and difficult for predators to reach. In 2012, the Detroit Zoo partnered with Save Our South Channel Lights, a non-profit group which provides support for the preservation of two historic shipping channel range lights. Prior to 2012, common terns were mostly nesting on the less suitable front-range light pier. In 2013, the colony moved to the rear range light pier after the Detroit Zoo made the habitat more suitable. Zoo staff has monitored this colony and banded chicks annually since 2013. The chicks are banded with colored leg bands which are used to monitor tern movements throughout southeast Michigan and the Great Lakes region.



In 2010, the Detroit Zoo hosted a Common Tern Roundtable which identified research needs and established a quantitative management target for common terns in the Detroit River-Western Lake Erie region. Our findings from common tern management thus far indicate that the amount productivity is correlated to the amount of time invested in predator control, habitat management and monitoring. Colonies isolated from land are potentially the most productive and successful. A summary of this workshop is available upon request from the author.

Forester's and Black Terns



Forester's and black tern colonies occur in large freshwater marshes of shallow lakes, embayment's and connecting channels. They typically nest in the marsh interior on floating mats of vegetation, which are protected by the emergent vegetation. The St. Clair Flats and Harsen's Island Wildlife Area, located in the northeastern Lake St. Clair, is Michigan's largest remaining wetland and represents one of the world's largest freshwater deltas.

Populations for both species have decreased markedly in Michigan since the 1960's, mainly due to habitat degradation and loss. An estimated 50% of Michigan's original wetlands and 70% of coastal wetlands have been lost since European settlement. Other causes for the decline include human disturbance (mainly from changing land and water usage), periodic cycles of high water, and environmental contaminants.

In 2013, a marsh tern advisory group was formed to study the breeding success of the two species of terns nesting in the St. Clair Flats and Harsen's Island Wildlife Area. The main objective of the group is to better understand whether either species is in need of conservation work, and develop necessary conservation strategies. Led by the National Audubon Society, this group includes the Detroit Audubon Society, Michigan Department of Natural

Resources, and the Detroit Zoological Society. The group selected a volunteer field technician to monitor the nesting areas with assistance provided by staff from each member's institution.

Fieldwork has been ongoing since 2013. Colonies are visited twice weekly during the height of the breeding season, and are only accessible by small watercraft. Most of the actual fieldwork is done off of the boat and requires wading into the marsh through thick mats of vegetation in chest-high water. The fieldwork consists of searching for new breeding activity, documenting new nests, weighing and measuring eggs and chicks, and banding chicks and adults.

The data collected so far suggests that marsh terns (and especially black terns) nest in the St. Clair Flats and Harsen's Island Wildlife Area in larger numbers than previously recognized. Although breeding success appears to be quite high, more monitoring is needed to fully understand the breeding biology and conservation needs for both species. This also confirms the importance of this area for the future breeding success of marsh terns in Michigan.

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TRAINING

Alcid Training at Omaha's Henry Doorly Zoo & Aquarium

Chris Felts and Nicole Shanklin



Like an increasing number of zoological institutions, we at the Henry Doorly Zoo and Aquarium have recently started scale training our Alcids, in order to provide a less stressful alternative to capturing our birds for weights. Previous articles in this newsletter, such as the one written by Tasha DiMarzio of Alaska SeaLife Center, for the 2014 newsletter, have sufficiently described the benefits of such husbandry training, so in this article we'd like to discuss some of the training decisions that have made our program successful.

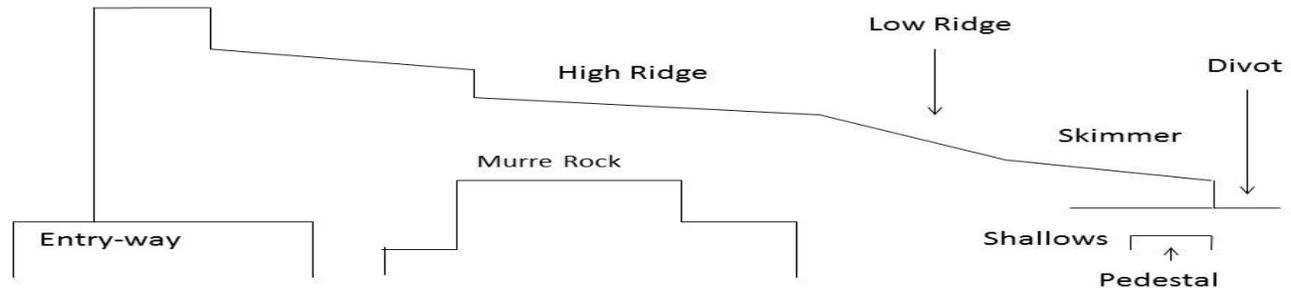
As with many behaviors, our Alcid scale training passed between outgoing and incoming zookeepers and had reached a

bit of a plateau. To move on from the sporadic participation of a few birds to our current status of about 90 percent of the exhibit stepping onto the scale consistently, we had to make a few changes.

First, we decided a two-person team would allow for more consistent training sessions across the seven-day work week, and cause less stress than the theoretical keeper attempting to do the whole thing by his or herself. In our experience this has also had additional benefits, such as certain birds progressing faster with certain trainers, trainers encouraging each other to push the birds forward, and much less burnout involving a repetitive task.

Second, we decided exactly what we wanted our trained behavior to be and set up a system for effective communication. Both of those ideas involved the picture below.

Puffin Training Zones



This crude drawing (made in powerpoint) was our way of breaking down our exhibit into zones and creating the steps toward our desired behavior, essentially creating our own language we used to communicate. Our end goal became the birds standing on a scale either at “High Ridge” or “Murre Rock”, based on how the birds approached us in the beginning of the process.

On that note, our third major decision was to treat the 26 birds in our exhibit as distinct individuals, who each occupied different levels of the training process. In action this meant asking for a more advanced position and therefore rewarding the more advanced birds first, then sliding further into the exhibit and rewarding less advanced birds for being on “Low Ridge” or the “Divot”, for example. As the birds progressed, we started to ask each of them for a more advanced position and, eventually, to move towards where the scale would be. This meant the birds needed to come to us instead of us moving towards them.



Only when we decided the birds were ready did we introduce the scale and only at its designated locations. In order to avoid confusion, we also decided not to use a whistle bridge and instead assume the immediate reward of getting a fish was clear enough.

Our final and perhaps most impactful training decision was to stagger the birds' diet outside of their breeding season. Instead of having food available at all times of the day, we now only put food out after our afternoon session is over, therefore giving the birds more incentive to take food from us during training sessions. In addition to this, we don't provide any food bowls twice a week, spreading the missed diet throughout the rest of the week and adding an element of uncertainty to the birds' food situation. The training sessions following these "no bowl days" are usually very successful, so we tend to bring the live scale into the exhibit to coincide with them.

As we mentioned earlier, all these changes have advanced our training in a fairly short period of time, and we can now get frequent, voluntary weights from about half our exhibit. We certainly still look forward to the day when all 26 of our birds weigh themselves, in part because one of our trainers has promised himself Chinese food when that happens. Hopefully you find our story and training methodology useful in your own Alcid training endeavors.

PUBLISHED WORK

History of Gulls in European and North American Zoos

Abstart:

Gulls are one of the most familiar and successful groups of birds, usually found in shorelines and other aquatic habitats across the world. They are rather large birds, usually grey or white, and numbering around 54 species. They have always been of limited interest for private aviculturists, but in the last century they were still widely kept in zoological gardens in Europe and North America. The popularity of gulls as zoo birds has declined in recent years. In this article, the authors discuss the history of gulls in zoos as well as experiences and observations on their diet, management, breeding and the presence of hybrids in captivity.

Journal Reference: Lindholm, J. III., & Svanberg, I. (2015). History of Gulls in European and North American Zoos. *Zool. Garten N.F.* 84, 207–233.

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

**If you have any ideas for next year or are interested in writing an article please contact Cody
Hickman at hickmanjc02@gmail.com.**

