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FROM THE EDITORS

We had intended to focus on the South American *Spheniscus* penguins in this issue. Unfortunately, some of the information we wanted to include was not available at this time. We will continue to provide information on these species in future issues.

In this issue, Nola Parsons (SANCCOB) describes the need for further study of penguin chick feather-loss disorder, which has occurred in both artificially reared African penguin chicks since 2006 and wild Magellanic penguin chicks since 2007. SANCCOB and scientists at St. John Fisher College in Rochester, New York are working together to identify the cause of this puzzling disorder.

Tom Schneider (Detroit Zoo and Penguin TAG Chair) describes recent changes to AZA’s managed animal programs, and how the new criteria will impact eight of the ten penguin species currently managed in North American institutions.

Rick Smith (St. Louis Zoological Park) shares information on the St. Louis Zoo’s efforts to quantify and reduce fish food waste in their penguin and puffin diets. Staff conducted a six month survey of fish usage at the Penguin and Puffin Coast. It is their hope that this information can be used by other institutions as they strive to reduce the amount of fish food waste, and continue to educate the public about sustainable seafood consumption.

Two different artificial nest burrows are featured: PVC nest burrows which have been successfully used for African penguin nesting for the past eighteen years at Mystic Aquarium, and plastic refuse bins recently used at the Pájaro Niño Island Humboldt penguin colony in central Chile. Both are examples of how a lot can be accomplished with very little.

Also included is a review of *Switch: How to Change When Change is Hard* (2010), written by Chip and Dan Heath. Chip was a workshop speaker at the recent American Association of Zookeepers (AAZK) National Conference. *Switch* describes useful concepts for facilitating change and making ideas “stick”, which can then be applied to penguin conservation messaging.

We thank all contributors to this issue: Dr. Nola Parsons (SANCCOB), Tom Schneider (Detroit Zoo), Rick Smith (St. Louis Zoological Park), Laurie Macha (Mystic Aquarium), Dr. Alejandro Simeone (Universidad Andres Bello), Dr. Roberta Wallace (Milwaukee Zoo), and Dr. Ginger Rebstock and Dr. Dee Boersma (University of Washington).

A special thanks to AAZK, Inc. and Susan Chan, Managing Editor AKF (Animal Keepers Forum) for allowing us to publish the paper *Good Catch*, which was presented at the 2011 AAZK National Conference.

We are always looking for content for future editions. If you or your institution have significant research, studies, hatches, acquisitions or events that you would like to share with our readers, please contact the editors.
PENGUIN CHICK FEATHER-LOSS DISORDER
Dr. Nola Parsons, Veterinarian, South African Foundation for the Conservation of Coastal Birds (SANCCOB), South Africa

Researchers from both sides of the Atlantic Ocean are grappling with a wildlife mystery: Why are some penguin chicks losing their feathers?

The feather-loss disorder first emerged in Cape Town, South Africa in 2006, when researchers at the Southern African Foundation for the Conservation of Coastal Birds (SANCCOB) first observed the disorder in African penguin chicks during artificial rearing at the centre. During that year, approximately 7% of the penguin chicks at the facility lost their feathers, followed by 18% in 2007, and 11% in 2008. Chicks with feather-loss disorder grew new plumage after losing their feathers and were released back into the wild. The feather-loss disorder is now seen routinely at SANCCOB each year but has never exceeded 20% of the chicks admitted for artificial rearing.

On the other side of the South Atlantic, researchers from the Wildlife Conservation Society (WCS) and the University of Washington as well as Centro Nacional Patagónico observed feather-loss disorder in the chicks of wild Magellanic penguins (closely related to African penguins) for the first time in 2007 in four different study sites along Argentina’s coastline. Researchers also noted that while feathered chicks sought out shade in the hot midday sun, featherless chicks remained in the sun’s glare. Several of the chicks with feather-loss disorder died during the study.

A study on the disorder appears in a recent edition of the journal *Waterbirds* (2010) 33(3): 415-421. The authors of the paper are researchers from the organizations listed above.

In both instances, penguin chicks with feather-loss disorder grew more slowly than feathered chicks. Featherless chicks were also smaller in size and weight than feathered chicks; both disparities were presumed to be due to the increased energy spent in thermoregulation in the absence of an insulating coat of feathers and/or down. So far, the possible causes include pathogens, thyroid disorders, nutrient imbalances, or genetics. It is not known whether the feather-loss disorder in both penguin species is related or not.

“Feather-loss disorders are uncommon in most bird species, and we need to conduct further study to determine the cause of the disorder and if this is in fact spreading to other penguin species,” said Dee Boersma, who has conducted studies on Magellanic penguins for more than three decades. “We need to learn how to stop the spread of feather-loss disorder, as penguins already have problems with oil pollution and climate variation,” said Boersma. “It’s important to keep disease from being added to the list of threats they face.”

Nola Parsons (the veterinarian and researcher at SANCCOB) says that the disorder in African penguins seen at the rehabilitation centre is probably caused by an infection as there is no evidence for a parasite, malnutrition, or stress. But the culprit has proven elusive, so Parsons took samples from affected penguins in 2010.
and is sending them to Greg Cunningham of St John Fisher College in Rochester, New York, who will try to identify what's causing the disorder. Parsons says that there have been several cases of feather-loss seen in wild African penguin chicks and although the chicks in their care recover it may have dire consequences to wild birds, and anything that threatens the African penguin is considered a problem due to their endangered status.

Should you wish to have more information and/or wish to contribute towards funding SANCCOB please contact Margaret Roestorf at Tel: +27 21 557 6155 Email: development@sanccob.co.za Website: www.sanccob.co.za

TWO EXAMPLES OF ARTIFICIAL NEST BURROWS

To provide information about a variety of topics related to both ex situ and in situ efforts, please look to this newsletter to see examples of methods and results experienced by others working with penguins. If your facility is using something new or different, contact us so we can share it with others. What follows are two examples of artificial nest burrows used at Mystic Aquarium for African penguins and at Pájaro Niño Island in central Chile for Humboldt penguins.

Mystic Aquarium, Mystic, CT - African Penguin Nests
The photos below show an artificial nest type used at the Mystic Aquarium for African penguins. The nests are made of ten-inch PVC pipe that has been cut longitudinally then heated and stretched to form an arch. The nests are durable and easy to clean and disinfect; the aquarium’s current supply of these nests has lasted 18 years. The “sticks” seen in the photo are artificial nesting sticks made of semi-flexible tubing. The tubing is heated at each end to seal the end closed and prevent bacteria from getting inside. The “sticks” are also easy to clean and disinfect.

Text and photos courtesy of Laurie Macha lmacha@searesearch.org; and Gayle Sirpenski, gsirpenski@searesearch.org, Mystic Aquarium
Pájaro Niño Island, Chile - Humboldt Penguin Nests

With the aim to contribute to the conservation of the Humboldt Penguin (*Spheniscus humboldti*), an IUCN Vulnerable species threatened by habitat destruction among other threats, we started a program based on the construction of artificial burrows at the colony on Pájaro Niño Island in central Chile. Nests were built from plastic bins (120 L capacity) following a very successful model implemented in Namibia by Jessica Kemper and colleagues. Bins were divided into two parts and then buried into the substrate simulating naturally-dug burrows.

The first nests were installed in March 2009 and an additional ten following the next year. Since then we have been monitoring the activity every 15 days on average. First signs of prospection were detected within the first month (at least five nests presented penguin guano in the interior). The first effective occupation was detected in November when an adult sitting on eggs was reported. The breeding pair incubated the eggs throughout a month, but deserted when the colony was occupied by Peruvian pelicans (*Pelecanus thagus*) which out-competed the penguins. In the following months, most artificial nests were buried into dirt and pelican guano. Starting this season (September 2011), new signs of occupation were detected (at least 2 nests presented penguins inside) and we are optimistic that new postures will appear in the following weeks.
Pájaro Niño Island, Chile - Humboldt Penguin Nests (continued)

Several artificial burrows in place at Pájaro Niño Island, Chile.

Humboldt penguin artificial burrow with nesting material.

Humboldt penguin inside artificial burrow at Pájaro Niño Island, Chile.

Humboldt penguin incubating eggs inside artificial burrow.

Peruvian pelicans nesting amongst Humboldt penguin artificial burrows at Pájaro Niño Island, Chile.

Humboldt penguin artificial burrows buried in dirt and pelican guano.

Text and photos courtesy of Dr. Alejandro Simeone, Universidad Andrés Bello, Artificial Nest Project, asimeone@unab.cl
“GOOD CATCH” Monitoring fish consumption/waste in order to reduce food fish waste at the Penguin and Puffin Coast
Rick Smith, smith@stlzoo.org, Penguin and Puffin Keeper, St. Louis Zoological Park, St. Louis Missouri

Abstract
With zoos and aquariums being at the forefront of educating the public about consuming sustainable seafood, it is our hope that these practices will help the conservation of many species of fish. Some of the fish we are trying to conserve are caught by commercial fisheries in the North Atlantic. These species are not only consumed by humans, but are also fed to a variety of zoo animals. In 2010 the staff at the Saint Louis Zoo’s Penguin and Puffin Coast (PPC) monitored food fish consumption and waste for our collection of penguins and puffins. A six-month survey determined how much fish was actually used from the daily breakout. Fish breakouts were monitored as penguin and puffin appetites changed (i.e.; molting, nesting, etc.). Our eventual goal was to reduce fish waste in the daily diets. During the initial period of the survey (six months) it was determined that the total average daily fish waste was 5.6kg (7.46 lbs). This is equivalent to an annual waste of 1134 kg (2500 lbs) at an approximate cost of $1200. We felt that from a conservation standpoint this was not acceptable. The survey was continued for six more months so that we could analyze the entire year’s fish use. From the data collected the PPC staff will be able to adjust future fish amounts to a more optimal level. It is hoped that this practice can serve as a model for other zoos and aquariums to monitor fish consumption and in turn adjust their diets to reduce fish waste.

Introduction
Zoological parks and aquariums feed a variety of fish to their animal residents. In order to ensure that a balanced diet is offered in sufficient quantity, fish waste (uneaten fish) often occurs. To better understand the amount of fish waste produced, a survey was created in 2010 to track fish waste at the St. Louis Zoo’s Penguin and Puffin Coast (PPC). Implemented in the spring of 2010 PPC keepers began to monitor the amount of fish usage and waste at PPC. A series of meetings were held with the zoo’s animal nutritionist. A sample goal of recording fish waste over four days each month was established. Initially seven monthly 4-day samples, April-October, were taken and then reviewed. The results indicated that there was significant fish waste daily. Based on these findings, the sampling was continued for five more months, November through March 2011. The first task of the analysis was to create an extensive record of the entire fish breakout that included daily diet items as well as the proportion of uneaten fish and any bycatch fish. The survey focused on four primary species of fish that make up the majority of our PPC diets; capelin, Atlantic herring, Atlantic mackerel, and lake smelt. Data from the results of the survey have aided PPC in its initial stages of more conservative fish usage. It is our hope that these practices will help the conservation of many species of fish and keep zoos and aquariums at the forefront of educating the public about sustainable seafood use. The PPC is focusing on the conservation of fish caught by commercial fisheries in the North Atlantic. These species are not only consumed by humans, but are also fed to a variety of zoo and aquarium animals. (See the summary of the primary food fishes and their fisheries below).

Species Biology and Fisheries History
Capelin (Mallotus villosus), Atlantic herring (Clupea harengus), Atlantic mackerel (Scromber scrombus), and lake (rainbow) smelt (Osmerus mordax), are caught by fisheries in Canada and the USA. Government agency assessments have shown that all of these species have had some population declines. Regulations in season, (Continued on page 7)
net size and total allowable catch (TAC) have had some positive management outcomes however these regulations include population growth that forecasts decline.

**Capelin.** Capelin are smelt-like, cold water pelagic, schooling fish found in Arctic and sub-Arctic seas in the Atlantic and Pacific. They are the most important forage species in the North Atlantic and are consumed by larger fish, seabirds, whales, osprey and eagles (NFCS 2011). Capelin eat small crustaceans (euphasiid spp.) that are loaded with keratin. This makes them an excellent fish choice for most zoo seabirds. Historically capelin has been eaten locally and used as a fertilizer product. The female capelin became a sought after species for its roe by the Japanese fishery. Large female capelin is selectively sorted from the males and smaller females that are then discarded. The Japanese collapsed their own capelin fishery using this practice but have continued to sort females in the North Atlantic’s international waters (NFCS 2011). The Canadian fishery off the west coast of Newfoundland also targets the mature females. Since the 1970s there has been a sharp increase in landings of several hundred tons per year with highs of ten thousand tons for bumper years. Capelin is also a shrimp fishery bycatch. The capelin fishery at this point appears to be somewhat stable on the west coast of Newfoundland; however surveys of capelin on the east coast of Newfoundland and the northern portion of the Gulf of St. Lawrence show declines since the 1990s (CSAS 2010).

**Atlantic herring.** Atlantic herring are supplied to zoos and aquariums from the USA and Canada. Atlantic herring is fished from New Jersey north to Newfoundland. Atlantic herring inhabit the continental shelf and inshore waters where they are a primary forage fish for larger fish and many marine animals. Robin *et al.* (1986) consider them to be “one of the world’s most valuable fishes” and have been a commercial fishery staple for decades. They are used fresh, salted, canned and for bait. They are most commonly used for fish oil, canned “sardines”, and as bait for the New England lobster fishing industry. They are often fed to the larger sea birds and marine mammals in zoos. TAC proposals for 2010-2012 include and predict a 7.5% population decline. Without these regulations the population would decline nearly 35%. Atlantic Herring, as long as it is regulated, will not decline into an overfished condition (NEFMC 2010).

**Atlantic mackerel.** The Atlantic mackerel is an attractive dark striped (mackerel striping) large pelagic schooling predator that is found from North Carolina to Labrador. Zoos and aquariums feed mackerel mostly to larger marine animals. Mackerel are sold at seafood markets but are not a popular fish for the average consumer. Overholtz (2006) reported that “their biomass has increased and mortality statistics were low. They therefore were not overfished and overfishing is not occurring”. In contrast The Transboundary Resources Assessment Committee report (TRAC.2010) had uncertain results and recommended a strategy to maintain low or neutral risks of exceeding mortality limits to prevent any overfishing. This decision was made because there were declines in older fish populations and lower numbers in egg surveys indicated in a reduced population (TRAC.2010).
Lake smelt. The lake smelt is a slender dark-backed silver fish with blue and pink stripes. It was originally distributed along the Atlantic Coastal Drainage but has since been introduced throughout the Great lakes. Lake smelt are major prey species for game fish. Smelt containing low levels of DDT, Mercury, and PCBs have been documented in government surveys. These contaminates are below guidelines established to protect wildlife consumers (McGoldrick, personal conversation 2011). In zoos and aquariums lake smelt is fed mostly to smaller seabirds and fish. Lake smelt is commercially fished mainly in Eastern Canada. The smelt fishery is stable and at present under-harvesting its quotas (OMNR 2011).

Methods and Results
In March 2010, an initial planning meeting was held with the St. Louis Zoo’s animal nutrition staff. In April 2010, one month’s data was reviewed and the focus of the project was developed. It was determined that we would need at least six months data before we could create any major plans to reduce the fish waste. A sample of four-day’s worth of fish use would be recorded monthly. The data for the 2010/2011 survey includes all of the fish species (capelin, herring, mackerel, lake smelt, etc.) we fed at PPC. The monthly data collected was calculated to percentages of fish thrown away from the diet. Results over seven months (April-October) showed an average fish waste of 5.9% or 3534 grams (7.8 lbs) (Table 1 survey A). A need for food fish conservation was identified. The survey continued for five additional months (November- March) so that we had a one year record of fish use (Table 1, Survey B). During both surveys a few gaps (indicated by blank spaces) occurred; this was due to keeper error (the food fish waste was ground up before it could be weighed). During the month of August only one day’s data could be collected. After reviewing the data, we focused on four primary fish that we feed at the St. Louis Zoo: capelin, Atlantic herring, Atlantic mackerel and lake smelt. Since lake smelt is a preferred food fish and is consumed most of the time, we omitted it from the percent waste calculations and from further review. The larger herring and mackerel are hand fed. Capelin, smaller-sized herring and lake smelt are offered in an iced tray. Capelin and medium herring made up the majority of what was leftover in the food trays. The uneaten fish are what the survey considers to be “waste”. In addition, any fish older than 24 hours post-thaw were considered spoiled and any fish that were mutilated (e.g., broken bellies), freezer burned or were subjectively determined to look bad were considered “non-consumable”. The bycatch fish is not a target species; bycatch is separated as a “treat” for specific birds that “like” them. Some bycatch such as sticklebacks (Spinachia spinachia), are discarded because they are not palatable.

Note: The average daily fish breakout amounts that are fed are as follows: capelin 44,946g (99.09lbs), Atlantic herring 11,350g (25.02lbs), Atlantic mackerel 1,335g (2.943lbs), lake smelt 4,994 (11.01lbs), and rainbow trout (Oncorhynchus mykiss) 800-1,000g (1.764-2.205lbs). In addition we mix silversides, squid and krill into our puffin diets.

Weighing fish to be fed to penguins and puffins at St. Louis Zoo’s Penguin and Puffin Coast. (Rick Smith)

Non-consumable “waste” (uneaten, expired, mutilated) fish. (Rick Smith)
Table 1 PPC 2010/2011 Fish Waste.

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<tr>
<th>Survey A</th>
<th>Average Waste %</th>
<th>Average Sum grams</th>
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<tr>
<td>Month</td>
<td></td>
<td></td>
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<tr>
<td>April</td>
<td>5.576677</td>
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<tr>
<td>May</td>
<td>6.560276</td>
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<tr>
<td>June</td>
<td>4.731082</td>
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<tr>
<td>July</td>
<td>6.839357</td>
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<tr>
<td>August</td>
<td></td>
<td></td>
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<tr>
<td>September</td>
<td>5.817435</td>
<td>3628.75</td>
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<tr>
<td>October</td>
<td>5.984869</td>
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<td>Average% A</td>
<td>5.91828267</td>
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<table>
<thead>
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<th>Survey B</th>
<th>Average Waste %</th>
<th>Average Sum grams</th>
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<tr>
<td>Month</td>
<td></td>
<td></td>
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<tr>
<td>November</td>
<td>15.77067</td>
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<td>December</td>
<td>3.866007</td>
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<td>January</td>
<td>7.26943</td>
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<td>February</td>
<td>6.413918</td>
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<td>March</td>
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<td>Average% B</td>
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<th>Sum average</th>
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<td>6.71964463</td>
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Survey A originally determined that the total average daily fish waste of 5.6% (3,402gms, 7.46lbs) of our capelin and herring are wasted. This is equivalent to an annual waste of about 1,134 kg (2500 lbs). The survey was continued for five more months so that we could determine if our prediction was accurate. The results from survey B were higher than A and showed the total average daily percent was 7.5% (4,248g, 9.3lbs). Survey B occurred over penguin nesting and molting seasons. This may be a factor because during these times the keepers have the most difficulty predicting how much food is needed. Penguins in zoos eat very little or fast during their molt. This was greatly exaggerated in November during King Penguin, *Aptenodytes patagonicus*, end of molting and beginning of nesting seasons. The results from survey A (and reflected from survey B) confirmed that in over a year’s time we may be throwing out just over one pallet (1134kg, 2500lbs) of fish. The financial cost of this waste is not too much (approximately $1200) but, if we are to practice wise consumption of this resource we must also recognize the significant biological loss this represents.

One unexpected favorable result was that the communication between co-workers increased. It appeared that after the first few months of collecting data keepers demonstrated an improved awareness of the need to reduce fish waste. This was done by observing what was being consumed the previous day. Daily fish
break-out amounts were recorded on a calendar and a dry-erase board was used to address any daily diet changes. The communication between our staff and the animal nutrition department appears to have reduced our over-stocking and over-feeding. Fish delivery changes are made after the keepers discuss how the birds are eating and the quantity of leftovers that are discarded. From these conversations we adjust the delivery to the birds’ present appetites. The results defend that these efforts are worthwhile because we no longer unconsciously “grind fish down the drain”. Unfortunately, predicting these trends and turning them into a concrete schedule has proved to be difficult with only one year’s data.

Over seven species of bycatch were found. Of that, alewife (*Alosa pseudoharengus*), a relative of the Atlantic herring, were most common and found in the Atlantic herring boxes. In the Gulf of Maine there have been several controversies over regulation changes concerning the alewife harvest. Immature Atlantic cod (*Gadus morhua*), were also found frequently with the capelin. Since the 1990s the cod industry has been shut down from overharvest and may never recover (Kurlinsky 1998).

**Conclusion**
There are very few records of food fish waste (at PPC) prior to the 2010/2011 Survey. From the 2010/2011 Fish Consumption/Waste Survey we now have a better view of how much fish is being thrown away every year. Though the quantity of waste is less than 10% of the total fed to the seabirds, this number still represents a large amount of wasted fish life. It is important to note that on November 25 data was very high (15kg, 34 lbs). This was not the only day during the survey that a larger than normal amount of fish were thrown away. The survey was created to address this kind of peak in our fish waste and may help to minimize any future mass wasting. We had hoped that the survey would have shown some sort of trend in our bird’s appetites and we could better predict what amount of fish we should offer them; however PPC is a multi-species exhibit with a variety of life stages occurring simultaneously throughout the year (i.e. nesting, molting, etc.). These factors complicate any forecasting of fish use. It appears that we will need more data collected from future surveys to complete the task. We may need to treat each exhibit separately instead of as a whole. Ultimately, the 2010/2011 survey has increased awareness of fish waste and prompted more conservative fish use. At present we are using smaller amounts of fish than we have fed in the past. There is a greater consciousness regarding appetite changes and altering the diets to better suit the birds consumption rates.

As demand for fish increases the economics will have an impact on what type of fish we will feed at zoos and aquarium. The 2010-2012 NEFMC herring fishery predictions are already decline in their “neutral harvest”. Pollutant have negative effects on fisheries, such as antibiotics from aquaculture, fish we give to animals. There is a need for wise conservation of these resources. If we ignore the historical matter how small, we will contribute to the fish waste results recorded during for all zoological parks that feed fish; concern. If one of the north Atlantic aquariums will look for alternative re-natives may not be the same quality. It stands to reason that if zoos and aquariums promote sustainable seafood use by the public then they should also strive towards more conservative food fish use at their institutions. We now have a better focus on our fish usage and we are better at communicating it to one another and that is “a good catch”.

(Continued on page 11)
Acknowledgements

I would like to express my gratitude to the Penguin Puffin Coast keeper staff for their assistance with this survey, zoo nutritionist Deb Schmitt and the St. Louis Zoological Park bird department management staff for their guidance during this project.

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Presented at the 2011 AAZK National Conference, August 24-28, 2011, San Diego, CA. Printed with permission from AAZK, Inc., Topeka, KS.

Parental Behavior Controls Incubation Period and Asynchrony of Hatching in Magellanic Penguins

Abstract: In many species of birds, periods of incubation of eggs within a clutch depend on the order in which the eggs were laid and determine whether the eggs hatch asynchronously or on the same day. Magellanic Penguins (Spheniscus magellanicus) lay two eggs 4 days apart that hatch 2 days apart; first eggs take 41 days to hatch, and second eggs take 39 days. We tested whether temperatures of the two eggs differ and whether delayed onset of incubation caused this pattern. First eggs were cooler than second eggs during their first few days (P < 0.001). First eggs averaged 23.4 ± 0.3 °C in the first 24–48 hours after they were laid. Second eggs averaged 27.9 ± 0.3 °C, warm enough for development. Egg temperature did not stabilize (33.9 °C) until eggs were about 18 days old. We swapped first and second eggs of different nests to determine if parental behavior caused the differences in temperatures and incubation periods. First eggs treated as second eggs developed as fast as control second eggs, and second eggs treated as first eggs developed nearly as slowly (40 days) as control first eggs. First eggs that were stored in a cooler until second eggs were laid took 2 days longer to hatch than control first eggs. Parental incubation behavior explained why the incubation period of second eggs was shorter than that of first eggs and controlled asynchrony of hatching, which affects chick growth and survival.


Links to Dee Boersma’s web pages http://mesh.biology.washington.edu/penguinProject with the above abstract. And this link to learn more about Dee’s work http://www.washington.edu/alumni/columns-magazine/december-2010/findings/penguin-pad.
THEY ARE NOW ALL SSPs
Tom Schneider, North American Penguin TAG Chair

Until recently, captive penguins were managed either as a Species Survival Program or as Population Management Plan. Both of these management programs utilized studbook data, or pedigrees, to make demographic and genetic analysis of the North American populations and make breeding recommendations for every individual in every AZA institution. The main differences between these two programs were that the SSPs required mandatory participation while PMPs recommendations were voluntary.

Recently these AZA programs have undergone a change. There are no longer PMPs, but rather all captive populations that have over 50 individuals are considered SSPs. There are two different SSP designations; Green and Yellow. Populations that can retain 90% genetic diversity for at least 100 years, or 10 generations, are Green SSP Programs. Green SSP Program recommendations are mandatory and AZA institutions must follow these recommendations. Populations that cannot retain 90% gene diversity for 100 years or 10 generations are Yellow SSP Programs. Participation in Yellow SSP Programs is voluntary.

Most penguin populations in North America have started with large founder bases and have reproduced consistently resulting in genetically and demographically stable populations. Because of this, eight of the ten species recommended for management plans in North America have met the criteria to be designated as Green SSPs. This includes the African, Humboldt, Magellanic, macaroni, gentoo, southern rockhopper, king and Adelie penguins.

Two penguin species did not meet the criteria for a Green SSP and have been designated as Yellow SSPs. These are the chinstrap and little penguin. Efforts continue to manage these populations to improve their genetic component. Recently it has been recommended that the regional little penguin studbooks be merged into an International Studbook that will allow this species to be managed cooperatively between the regional zoo associations. The other two species of penguins in AZA institutions, northern rockhopper and emperor, either exist in small numbers (rockhoppers) or are at one institution. The emperor is only kept at Sea World San Diego and they are carefully managing this colony.

The good news is that penguins in AZA institutions have healthy populations that will be sustainable for over 100 years without any additional recruitment. Visitors to zoos and aquariums will be able to enjoy these popular birds for many generations, and also learn about the threats that penguins may continue to face in the wild.

RECOMMENDED REFERENCES


(Continued on page 13)


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FLIPPING THE SWITCH
Linda Henry, Editor, PCN

Readers may already be familiar with Chip Heath who was a general session speaker at AZA this past September. Chip, along with his brother Dan, have written two books—Switch: How to Change When Change is Hard (2010) and Made to Stick: Why Some Ideas Survive and Others Die (2007). Chip Heath was also a workshop speaker at the 2011 AAZK National Conference (San Diego, August 24-28).

These authors may be popular because both books offer a blueprint for making change happen and making ideas “sticky”. In reading both books, I saw how easily the concepts described by the Heath brothers could be used in shaping messages that inspire and promote positive conservation change behaviors.

In Switch the obvious statement is made that “For things to change, somebody somewhere has to start acting differently”. But where does one begin to get someone or a group of people to change? And is the person or group the thing that needs to change or is it the situation that needs changing? For our particular message, penguin conservation, the change that is needed may seem very abstract to our audience. How do we make these messages more concrete and actionable?

The authors explore the change equation by explaining that in leading a change effort it is important to understand that you must not only change the situation but change hearts and minds too. They use metaphor to describe how each person is being driven by two sides—the emotional Elephant side and the rational Driver side—and that the “path” or situation must be clear for change to be successful: Motivate the Elephant, direct the Rider, and Shape the Path.

These are the three core concepts of the book Switch. The authors go on to explore each aspect in detail. Using both case studies of successful change efforts as well as “clinics” (real world scenarios as practice sessions) the authors provide tools for readers to apply to their own change efforts. The key questions are “What is the Switch and what is holding it back?” and “How do we make the Switch?”

I have read and recommend both books. I found them helpful in reshaping my approach to conservation messaging. Both books are widely available and supplemental information is available at the Heath Brother’s website (http://www.heathbrothers.com Resources section).
NEWS AND UPDATES

An oil spill has occurred from a damaged ship off the coast of New Zealand. On October 5, 2011 the container ship Rena, en route to the Port of Tauranga, ran aground on Astrolabe Reef off the North Island. At the time PCN went to publication the ship had spilled an estimated 350 tons of oil. Another 1400 tons of oil are in danger of spilling from the ship that is feared to be structurally damaged and may break up as bad weather approaches. Oil has already entered the Bay of Plenty and soiled several kilometers of beach. An estimated 200 birds, including little blue penguins, have died from oiling. An animal rescue center has been set up in Tauranga. Many political leaders have dubbed this spill as the worst environmental disaster to hit New Zealand. Updates can be found online including this link at http://www.bayofplentytimes.co.nz/news/oil-spill-wwf-arrives-help-rescue-wildlife/1133020.

Revisions to the Penguin Animal Care Manual (ACM) continue. The ACM is a compendium of animal care and management information collected from a variety of experts in the field. The Association of Zoos and Aquariums (AZA) require that accredited institutions have an ACM available to their animal care staff. Several chapters have been completed by penguin Taxon Advisory Group (TAG) members and have been submitted for review by the Steering Committee. Learn more about ACMs at http://www.aza.org/animal-care-manuals.

Emperor penguin rescue and release: On June 20 an emperor penguin washed up on Peka Peka beach, New Zealand. Dubbed “Happy Feet,” the bird was only the second emperor penguin known to have been seen in New Zealand. The bird was observed eating sand while on shore and it was decided to take the bird to the Wellington Zoo for care. Veterinarians removed approximately 3 kg of sand from the bird’s ventricle during several endoscopic procedures. The bird was maintained at the zoo until the bird was transferred to a ship for release into the southern ocean on September 4. The emperor penguin had been fitted with a Sirtrack KiwiSat 202 Satellite Transmitter but contact was lost by September 9.

In August Alex Waier offered the following updates with regard to the Humboldt SSP:

- Dr. Michael Adkesson (Brookfield Zoo) is now a member of the Vet Advisor team where he joins Dr. Roberta Wallace (Milwaukee County Zoo).
- Plans are in place to grow the North American population over the next several years; there has been increased interest in exhibiting this species.
- Active research projects continue in Punta San Juan, Peru, where the St. Louis Zoo-Brookfield Zoo-Philadelphia Zoo Consortium is conducting health assessments including environmental contamination, vitamin levels and gene dispersal. In addition, as also mentioned by Dr. Wallace below, they have been supporting the annual census in Chile for the last ten years and are now focusing on the development of educational materials. Another guano harvest is expected in Peru this year and efforts have been focused on allocating staffing and financial aid to the area to support monitoring of the harvest.

Dr. Roberta Wallace reported in July with regard to Humboldt penguins that "we have developed a Spanish/English penguin information pamphlet that I hope will be distributed to ecotourists, tourist centers and schools in Chile. We are working on bilingual laminated posters as well. We will not be doing a Humboldt penguin census this year." A PDF of the pamphlet can be obtained by emailing Dr. Wallace at roberta.wallace@milwcnty.com. (The PDF is designed to fold so a portion of the PDF will appear upside-down when read online).

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An emperor penguin chick hatched August 17 at Laohutan Pole Aquarium in Dalian, Liaoning Province, China. The chick was removed from the parents for hand rearing.

Lucy, the first ever juvenile African penguin to be fitted with a satellite transmitter (PTT) was released by SANCCOB on June 26, 2011. Read her story at http://www.sanccob.co.za/?m=7&s=7&idkey=872. Find updates on the satellite tracking for several more birds at http://penguins.adu.org.za/.

Another Oil spill: On March 16, 2011, in the wake of the March 11 earthquake disaster in Japan, the MS Olivia ran aground on Nightingale Island, Tristan de Cunha. The ship broke up spilling oil 2 days after it was grounded. Oil was the most immediate threat to the local habitat, home to many rare bird species. Rats that might escape from the ship were another concern as a long term threat to the ecosystem. A rescue operation began as soon as the magnitude of the event was known. Locals and volunteers from SANCCOB worked to save the oiled northern rockhopper penguins. The penguins were just finishing their molt cycle. The last 180 oiled birds were released in July 2011. A total of 3,718 birds were recovered with 381 total birds released—an approximate 10% survival rate from intake to release. To date, there have been no reports of rat sightings.

In March 2011 more than 70 Magellanic penguins were found dead over two days off the coast of Brazil, some apparently affected by poultry oil. Eleven birds were found alive and transferred to the Centre for Coastal Studies, Limnology and Marine (CECLIMA) in Imbe but the outcome of the birds is unknown. This was considered the largest amount of oil ever seen on penguins in the region in three years.

In late February 2011 the U.S. Fish and Wildlife Service announced that the New Zealand/Australia distinct population segment of the southern rockhopper penguin is now protected as threatened under the Endangered Species Act (ESA). The population size of this species has fallen 90% since the 1940’s and continues to decline.

The Brazil Zoo sent nearly two dozen penguins to California in February 2011. The Magellanic penguins were birds that had been swept to the shores of Brazil in 2010. Similar beaching has been recorded since 2008 when 700 penguins landed in Brazil debilitated and exhausted.

EVENTS AND ANNOUNCEMENTS

8-9 October 2011  Simon’s Town Penguin Festival; Simon’s Town, South Africa; http://www.sanccob.co.za
15 October 2011  Mystic Aquarium’s 5th Annual Run/Walk for African Penguins; http://www.mysticaquarium.org
20 January 2012  Penguin Awareness Day
25 April 2012  World Penguin Day
2-6 September 2013  8th International Penguin Conference, Bristol, UK; http://combine.cs.bris.ac.uk/ipc/