

Captive Population Management

Panel Organizers

Diana Weinhardt

PBI Advisory Council, Pearland, TX

Speakers

Ann Petric, Mammal Curator, Brookfield Zoo, Brookfield, IL

Dr. Tom Spady, Reproductive Physiologist, Center for Reproduction of Endangered Species (CRES), San Diego Zoo, San Diego, CA

Diana Weinhardt

Advisory Council, PBI

Weinhardt briefly addressed the history of captive population management.

America's first zoo opened in 1874 in Philadelphia. Captive polar bears at that time lived from one to five years. In the 1900s captive bears began to live into their teens and early 20s. Now, the average captive polar bear lives into its mid-20s.

Exhibits have evolved to become more like natural environments. Initial exhibits were concrete grottos with moats. Exhibits today include pools with fish, ice machines, and natural substrate for digging.

Polar bear reproductive rates in the past were high, but survival was low. Now, reproductive rates are low—due to managed breeding—but survival rates are higher. We need an occasional influx of wild-caught animals to keep the breeding stock healthy, though; in the last ten years, we have had only five cubs adopted by zoos.

Zoo goals today are:

- Conservation
- Education
- Recreation
- Research

Ann Petric

Mammal Curator, Brookfield Zoo, Brookfield, IL

Case study. What makes for a successful reproductive history and high cub-survival rate in the captive population?

Polar bears at the Brookfield Zoo have reproduced many times, but the survival rate of the cubs was very low—until 1972, when the zoo introduced new maternal dens. Now, out of four breeding females, three have raised cubs. In 31 years, the zoo has had 15 litters, with 24 cubs born. Out of

the 24, 16 survived—a 67% survival rate. All cubs were mother-raised, with one exception.

The zoo believes the primary factors for its success are the maternity igloo/den and updated dam/cub management practices. Once the mother is locked into the den, keepers can watch her only via a built-in camera. The mother is given water, but no food. She is given privacy, no disturbances, and familiar keepers.

Cub management practices have also changed. Introducing a new cub to the exhibit sometimes led to injury or death: cubs could fall into a dry moat or drown in the pool. Now, keepers add water to the pool gradually so cubs can adjust. They also choose enrichment tools of an appropriate size for the cub, and ensure appropriate food-particle size to reduce choking. They keep the entire top of the pool free from solid ice to prevent a cub from drowning under the ice.

Tom Spady, Ph.D.

Reproductive Physiologist, Center for Reproduction of Endangered Species (CRES), San Diego Zoo, San Diego, CA

Case study. Of all the bear species, we know most about the estrus cycles of pandas. How many estrus cycles occur in polar bears—and how long is each cycle? This study began February 1, 2004 and will continue until May 31, 2004.

Why is it important to understand polar bear estrus cycles?

Ovarian cyclicity is an early indicator of reproductive health, and is often the first thing to be adversely affected when environmental conditions are poor. Understanding how it should occur will clue us in to potential problems with a bear.

It can help us develop effective contraceptives, time introductions for natural breeding, schedule animal separations, and more effectively apply assisted reproductive techniques (ART).

This study looks at several factors with regard to estrus cycles:

- Physiologic characteristics, such as changes in vulva
- Morphologic characteristics such as changes in vaginal cells
- Sexual behavior changes
- Endocrine profile in feces
- Scent gland chemical profile (females have secretions between the digits of their paws)

The CRES study is yet another illustration of how training helps us do research. Keepers have trained the bears in the study to submit to noninvasive testing, and the keepers collaborate with researchers to acquire the samples.