Order:	Ciconiiformes	**Family:**	Ciconiidae
Scientific Name:	*Ephippiorhynchus senegalensis*	**Common Name:**	Saddle-billed stork

AZA Management: ☐ Green ☒ Yellow ☐ Red ☐ None

Photo (Male): Adult, dark brown eyes

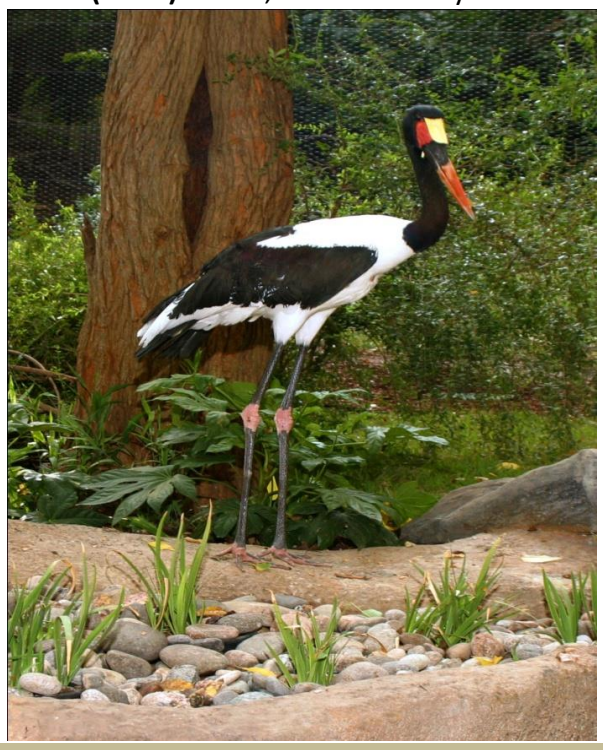

Photo (Female): Adult, golden yellow eyes

NATURAL HISTORY:

Geographic Range:	Europe	☐	Asia	☐	North America	☐	Neotropical	☐
	Africa	☒	Australia	☐	Other	Click here to enter text.		
Habitat:	Forest	☐	Desert	☐	Grassland	☐	Coastal	☐
	Riverine	☒	Montane	☐	Other	Click here to enter text.		
Circadian Cycle:	Diurnal	☒	Crepuscular	☐	Nocturnal	☐	Other	Click here to enter text.
Cold Tolerance:	To 70° F	☐	To 60° F	☐	To 50° F	☐	To 40° F	☐
	To 30° F	☒	To 20° F	☐	Other	Click here to enter text.		
Heat Tolerance:	To 30° F	☐	To 50° F	☐	To 70° F	☐	To 90° F	☐
	To 110° F	☒	Other	Click here to enter text.				
Diet:	Frugivore	☐	Carnivore	☒	Piscivore	☐	Insectivore	☐
	Nectivore	☐	Omnivore	☐	Folivore	☐	Other (Add Below)	☐

Captive Dietary Needs:

Saddle-billed storks eat fish, amphibians, crustaceans, insects, and small mammals. Adults easily swallow fish that are 6 to 12 inches (15-30 cm) in length and weigh 1 pound (500g). A ground meat

product (for example: beef or horse) combined with whole prey items (mice, chicks) and one or more fish species (capelin, smelt, trout, sardines, etc.) provides a good variety. Live insects are a favorite.

In zoos, diets for saddle-billed storks should minimally include a selection of fish, small rodents, large insects, and a vitamin and mineral supplement. The diet for adults with offspring should initially be modified to minimize indigestible material (fur, feathers, fins, chitin, and large bones). Offspring cannot caste until they are 30 days old, and proventricular impaction might otherwise result.

Vitamin/Mineral supplementation: Metabolic bone disease is a serious concern for this species. Growing saddle-billed storks need appropriate supplementation for adequate bone growth. The amounts suggested below were established for nestlings in a covered area that light could penetrate, but little ultraviolet light penetrated to the nest. Vitamin D and Calcium tablets without phosphorous was selected. Calcium was administered orally by keepers to each chick each morning.

Suggested daily diet ration per one (1) bird. Note: the weights of the diet items average as follows: whole mouse 0.73oz (23g), skinned mouse 0.67oz (19g), Gallus gallus whole domestic chicks 1.18oz (37g), skinned chicks 1.0 oz (34g)

DIET FOR ONE (1) ADULT during Non-Breeding Season (01 January to 31 July). Diets are fed twice per day, with mice and a premium beef feline diet offered in the morning, and fish and insects in the afternoon.

3 mice
4 oz premium beef feline diet
2 oz smelt
12 oz. capelin
15 giant mealworms or 30 live crickets
½ tablespoons Ca/Vionate in non-breeding ratios
2 Mazuri Vita-Zu Bird w/o Vit A* tabs inserted into the fish/ or ½ cc thiamin Vit E paste

DIET FOR ONE (1) ADULT during Breeding Season (generally, breeding activity can occur 01 August to 31 December. Offer this diet as long as chicks are being reared). Diets are fed twice per day, with mice, chicks and premium beef feline diet offered in the morning, and fish and insects in the afternoon.

3 mice
1 chick
4 oz premium beef feline diet
2 oz smelt
20 oz. capelin
15 giant mealworms or 30 live crickets
2 tabs Cooper Calcium Citrate 250mg Ca/tablet (1 tab=1.25g)
1 1/2 Mazuri Vita-Zu Bird w/o Vit. A tabs inserted into the fish (use these vitamins for breeding and chick rearing.)

DIET FOR TWO (2) ADULTS during Breeding Season
6 mice
2 chicks
8 oz premium beef feline diet
4 oz smelt
40 oz capelin
30 giant mealworms or 60 live crickets
4 tabs Cooper Calcium Citrate 250mg Ca/tablet (1 tab=1.25g)
3 Mazuri Vita-Zu Bird w/o vit A tabs inserted into the fish (use these vitamins for breeding and chick rearing)

FOOD PREPARATION BASICS

DIET FOR ONE (1) ADULT during Brooding of Offspring
ADULT Brooding diet - along with offspring's portions - are divided into 3 equal portions fed out at 7:30 a.m. (0730), 11:30 a.m. (1130), and 3:30 p.m. (1530) The last bowl is left overnight.

This diet was developed with these particular items in mind:
1) Removal of any portion of the prey item that might cause an impaction risk (i.e. fur, feet, beaks, etc.); including items fed other species sharing the exhibit. In addition, insects are removed from the rearing diet at the early stages, because of indigestibility of chitin.

2) Growing saddle-billed storks need appropriate supplementation for adequate bone growth. The supplementation regimen had changes to include Cooper Calcium Citrate and Nature Made Vit D adjusted for age based upon previous growth rates. Mazuri Vita-Zu Bird w/o vit A is included to supplement the fish to ensure adequate vitamin E and thiamin.

Day 1 to30 - 45 days
Parents eat their offspring's diet and regurgitate it to the offspring.
Day 30-40 they may begin carrying food items to the nest for the young.
Day 65- 100 Days old fledging occurs. Once chicks have left the nest, they continue to be fed by the parents, but can eat from the food bowl.

**Saddle-billed stork parents feeding offspring should have access to food at all times while taking care of chicks. If the adults are clearing their food bowls between feedings, the amount of food offered should be increased. A breeding female was observed killing two of her chicks from a clutch of four at a time when food bowls were empty for several hours between feedings. The amounts below are suggested and can be adjusted if necessary. It is recommended that food consumption tracking be maintained in an effort to keep enough food before the parents.

Adult Diet amounts Daily (1 Adult with chicks)

Age of Offspring (1-20 days)
3 skinned and crushed mice

1 skinned and crushed chick
4 oz premium beef feline diet
2 oz crushed smelt
20 oz crushed capelin (head and fins removed)
3 tabs Cooper Calcium Citrate 250mg Ca/tablet (1 tab=1.25g)
3 Mazuri Vita-Zu Bird w/o vit A tabs inserted into fish (crushed with chicks and mixed in diet)

Age of Offspring (21-22 days); 1 Adult with chicks
2 skinned and crushed mice
1 cut mouse with pelt (3-4 pieces)
1 skinned and cut chick
4 oz premium beef feline diet
2 oz smelt
20 oz small capelin
3 tabs Cooper Calcium Citrate 250mg Ca/tablet (1 tab=1.25g)
3 Mazuri Vita-Zu Bird w/o vit A tabs (crushed, mixed in diet)

Age of Offspring (23-24 days)); 1 Adult with chicks
2 skinned and cut mice
1 cut mouse with pelt
1 cut chick with pelt
4 oz premium beef feline diet
2 oz smelt
20 oz whole small capelin
3 tabs Cooper Calcium Citrate 250mg Ca/tablet (1 tab=1.25g)
3 Mazuri Vita-Zu Bird w/o vit A tabs (crushed and mixed in diet)

Age of Offspring (25-26 days)); 1 Adult with chicks
1 skinned and cut mice
2 cut mice with pelts
1 cut chick with pelt
4 oz premium beef feline diet
2 oz smelt
20 oz small capelin
3 tabs Cooper Calcium Citrate 250mg Ca/tablet (1 tab=1.25g)
3 Mazuri Vita-Zu Bird w/o vit A tabs (crushed mixed in diet)

Age of Offspring (27-29 days)); 1 Adult with chicks
3 cut mice with pelts
1 cut chick with pelt
4 oz premium beef feline diet
2 oz smelt
20 oz small capelin
3 tabs Cooper Calcium Citrate 250mg Ca/tablet (1 tab= 1.25g)

3 Mazuri Vita-zu Bird w/o vit A tabs (crushed mixed in diet)

Age of Offspring (30-100 days)); 1 Adult with chicks
3 whole mice
1 whole chick
4 oz premium beef feline diet
2 oz smelt
20 oz capelin
15 giant mealworms or 30 live crickets
3 tabs Cooper Calcium Citrate 250mg Ca/tablet (1 tab=1.25g)
3 Mazuri Vita-zu Bird w/o vit A tabs (crushed mixed in diet)

FOOD PREPARATION AND SUPPLEMENTATION INSTRUCTIONS

CHICK DIET (1) PARENT-REARED (Daily)
Metabolic bone disease is a serious concern for this species. It is very important, therefore, that each chick receive their specific vitamin and mineral amounts. The adults may dip the food in water before swallowing, thus rinsing all of the vitamin/mineral powder off of the food. If this occurs it may be necessary to directly feed the vitamins and minerals to the chick by placing them in a food item and tossing that item directly to each chick or giving the chick the prescribed amount orally each day.

The following amounts are designated as to be fed directly to the chick or added to the adult's food bowl.

Cooper Calcium Citrate 250mg Ca/tablet and Nature Made Vit D3 400 IU supplementation fed orally directly to the chick:

Amounts are dependent upon the chicks weights:
Day 1 to 2lbs (1 kg) – 1/8 tab Ca Citrate; 1/16 tab Vit D
2lbs (1 kg) to 6lbs (3 kg)- ¼ tab Ca Citrate; 1/8 tab Vit D
6lbs (3 kg) to fledge – ½ tab Ca Citrate; ¼ tab Vit D

Additional Ca Citrate crushed and mixed in the diet:
Day 1-2 7/8 tab Ca citrate
Day 3-14 1 7/8 tab Ca Citrate
Day 15-Fledge 2 tabs Ca Citrate

Age of Offspring (1-2 days) ; CHICK DIET (1)
2 skinned and crushed mice, head, feet, tail removed
1 skinned and crushed chick, head and feet removed
1 oz premium beef feline diet
5 oz crushed capelin, head and find removed, cut in small pieces
1 crushed Mazuri Vita-zu Bird w/o Vit. A tab sprinkled over the fish
7/8 tab Ca Citrate crushed and sprinkled on food

Feed to chick
1/8 tab Ca Citrate
1/16 tab vit D
Age of Offspring (3-7) ; CHICK DIET (1)
4 skinned and crushed mice, head, feet, tails removed
2 skinned and crushed chicks, head and feet removed
4 oz premium beef feline diet
12 Oz crushed capelin, head and fins removed, cut in small pieces
2 crushed Mazuri Vita-zu Bird w/o Vit. A tab sprinkled over the fish
1 & 7/8 tab of Ca Citrate crushed and sprinkled on food

Feed to chick
1/8 tab Ca Citrate
1/16 tab Vit D

Age of Offspring (8-14 days) ; CHICK DIET (1)
6 skinned and crushed mice, head, feet, tails removed
2 skinned and crushed chicks, head and feet removed
4 oz premium beef feline diet
2 ounce crushed smelt
12 oz crushed capelin, head and fins removed, cut in pieces
2 crushed Mazuri Vita-zu Bird w/o Vit. A tab sprinkled over the fish
1 & 7/8 tab of Ca Citrate crushed and sprinkled on food

Feed to Chick
1/8 tab Ca citrate
1/16 tab Vit D

Age of Offspring (15-21 days) ; CHICK DIET (1)
10 skinned and crushed mice, feet and tails removed
2 skinned and crushed chick, head and feet removed
8 oz premium beef feline diet
4 ounce crushed smelt
16 oz crushed capelin, head and fins removed
3 crushed Mazuri Vita-zu Bird w/o Vit. A tab sprinkled over the fish
2 Tabs of Ca Citrate crushed and sprinkled on food
Note: feed ½ mouse pelt directly to each chick on Days 18 to 21.

Feed to chick
¼ tab Ca Citrate
1/8 tab Vit D

Age of Offspring (22-28 days) ; CHICK DIET (1)

10 skinned and crushed mice
2 skinned and crushed chick
8 oz premium beef feline diet

4 ounce crushed smelt
16 oz whole small capelin
3 Mazuri Vita-zu Bird w/o Vit. A tab inserted into the capelin
3 crushed Mazuri Vita-zu Bird w/o Vit. A tab sprinkled over the fish
2 Tabs of Ca Citrate crushed and sprinkled on food
Note: feed 1 mouse pelt directly to each chick on Days 22 to 24.
Note: feed 1 ½ mouse pelts directly to each chick on Days 25 to 27.
Note: feed 2 mouse pelts directly to each chick on Day 28.
Feed to chick
¼ tab Ca Citrate
1/8 tab Vit D

Age of Offspring (29-35 days) ; CHICK DIET (1)
5 skinned whole mice
5 whole mice with pelts
2 whole chicks with pelts
8 oz premium beef feline diet
4 ounce whole smelt
16 oz whole capelin
5 giant mealworms or 8 live crickets
3 Mazuri Vita-zu Bird w/o Vit. A tabs inserted into the capelin
2 Tabs of Ca Citrate crushed and sprinkled on food
Feed to chick
½ tab Ca Citrate
¼ tab Vit D

Age of Offspring (36-67 days); CHICK DIET (1)

10 whole mice with pelts
1 whole chick with pelts
12 oz premium beef feline diet
4 ounce whole smelt
16 oz whole capelin
5 giant mealworms or 8 live crickets
3 Mazuri Vita-zu Bird w/o Vit. A tabs inserted into the capelin
2 Tabs of Ca Citrate crushed and sprinkled on food

Feed to Chick
½ tab Ca Citrate
¼ tab Vit D

Age of Offspring (68-100 days)

6 whole mice with pelts
1 whole chicks with pelts
4 oz premium beef feline diet
4 oz whole smelt
16 oz whole capelin
10 giant mealworms or 20 live crickets
3 Mazuri Vita-zu Bird w/o Vit. A tabs inserted into the capelin
2 Tabs of Ca Citrate crushed and sprinkled on food

Feed orally to chick
½ tab Ca Citrate
¼ tab Vit D

DIET FOR ONE (1) HAND-RAISED OFFSPRING

See also hand-raising guidelines in Parental Care section.

The chart below should be used to figure the amount of supplements required to administer to the chick each day. Please note it is based on the body weight of the chick and should be used day 3 through day 39. Supplement amounts are listed in the individual daily diet for day 2 and past day 39.

	Total Daily Weight (g) of Chick Diet up to Day 39							
Supplement	100-200g	200-300g	300-400	400-499	500-649	650-749	750-849	850-950
Rep-Cal w/o Vitamin D	3/16 tsp	3/16 tsp	1/2 tsp	1/2 tsp	3/4 tsp	3/4 tsp	1 tsp	1 tsp
Cooper Calcium Citrate	0	0	1/8 tab	1/4 tab	1/4 tab	1/2 tab	1 tab	1 tab
Nature Made Vit D 400IU/tab	0	0	1/16 tab	3/16 tab	3/16 tab	1/4 tab	1/4 tab	3/8 tab
Mazuri Vita-Zu Bird w/o Vit A	1/4 tab	1/4 tab	1/2 tab	1 tab	1.5 tab	1.5 tab	2 tab	2 tab
Vionate	5/16 tsp	3/8 tsp	5/16 tsp	0	0	0	0	0
Diet is 75% mouse, 25% capelin by weight								

Diet is 75% mouse, 25% capelin by weight

DAILY DIET SCHEDULE

DAY 1 - No food. (allow for complete absorption of yolk)

DAY 2 - Offer 30% of body weight total for day. Five (5) feedings, 6% of body weight per feeding. Expected weight gain 5-10%.

- ¾ by weight: mouse (head, tail, feet removed, skinned, bones crushed, pulverized).
- ¼ by weight: capelin (with head and fins removed, chopped fine.)
- 1/16 teaspoon Repcal w/o Vitamin D added to first feeding
- 1/16 teaspoon Vionate added to first feeding

DAY 3 to 7 Offer 75% of body weight total for day. Five (5) feedings, 15% of body weight per feeding. Expected weight gain 25%.

- ¾ by weight: mouse (skinned, bones crushed, pulverized).
- ¼ by weight: capelin (with head and fins removed).
- Supplements from chart

DAY 8 to Day 10 - Offer 90% of body weight total for day. Five (5) feedings, 18% of body weight per feeding. Expected weight gain 25-35%.

- ¾ by weight: mouse (head, tail, feet removed, skinned, bones crushed, pulverized).
- ¼ by weight: capelin (with head and fins removed, chopped).
- Supplements from chart

DAY 11 to Day 14 - Offer 75% of body weight total for day. Five (5) feedings, 15% of body weight per feeding. Expected weight gain 20-30%.

- ¾ by weight: mouse (head, tail, feet removed, skinned, bones crushed, pulverized).
- ¼ by weight: capelin (with head and fins removed, chopped.)
- Supplements from chart

DAY 15 to Day 20 - Offer 50% of body weight total for day. Five (5) feedings, 10% of body weight per feeding. Expected weight gain 15-20%.

- ¾ by weight: mouse (tail, feet removed, skinned, bones crushed, chopped).
- ¼ by weight: capelin (with head and tail removed, chopped).
- Supplements from chart

DAY 21 to Day 24 - Offer 40% of body weight total for day. Four (4) feedings, 10% of body weight per feeding. Expected weight gain 10-15%

- ¾ by weight: mouse (skinned, bones crushed, chopped).
- ¼ by weight: capelin (with head and tail removed, cut in small pieces).
- Supplements from chart
- At Day 21 start adding mouse fur as casting material, and slowly increasing size of food pieces. Begin with ½ mouse pelt daily, increasing by ½ mouse pelt every three days.

DAY 25 to DAY 29 - Offer 30% of body weight total for day. Four (4) feedings, 7.5% of body weight per feeding. Expected weight gain 5-10%.

- ¾ by weight: mouse (skinned, bones crushed, chopped).
- ¼ by weight: capelin (with head and tail removed, cut in large pieces).
- Continue adding mouse fur as casting material, and slowly increase size of food pieces.
- Supplements from chart

DAY 30 to DAY 39 - Offer 30% of body weight total for day. Three (3) feedings, 10% of body weight per feeding. Expected weight gain 5-10%

- ¾ by weight: mouse (skinned, bones crushed, chopped).
- ¼ by weight: capelin (head and tail removed).
- Continue adding mouse fur as casting material, and slowly increase size of food pieces.
- Supplements from chart

DAY 40 to DAY 49 - Offer 30% of body weight total for day. Two (2) feedings, 15% of body weight per feeding. Expected weight gain 5-10%

- ¼ by weight: whole mouse offered in morning.
- ¼ by weight: Nebraska premium Beef Feline Diet offered in morning.
- ¼ by weight: whole capelin offered in afternoon.
- ¼ by weight: crushed chick offered in afternoon.
- Discontinue supplement chart.
- 2 tab Mazuri Vita-Zu per kg diet
- 1 tab Cooper Calcium Citrate per kg diet

DAY 50 to DAY 80 - Offer 30% of body weight total for day. Two (2) feedings, 15 % of body weight per feeding. Expected weight gain 5-10%

- ¼ by weight: whole mouse offered in morning.
- ¼ by weight: Birds of Prey Diet offered in morning.
- ¼ by weight: whole capelin offered in afternoon.
- ¼ by weight: crushed chick offered in afternoon.
- Begin offering 10 live mealworms and 10 live crickets as forage.
- 2 tab Mazuri Vita-Zu per kg diet
- 1 tab Cooper Calcium Citrate per kg diet

DAY 81 to DAY 100 - Provide adult diet and monitor intake. Adult Saddlebills weigh 10-14 pounds and consume 10% to 12% of body weight per day.

Distributors of some components mentioned in the diets:

*Mazuri Vita-Zu Bird, no vitamin A added, #5TLC – Mazuri Exotic Animal Nutrition; PMI Nutrition International, LLC; P.O. Box 19798; Brentwood, MO 63144; 1-800-227-8941; www.mazuri.com

*Cooper Calcium Citrate 250mg Ca/tablet – Cooper Concepts, Inc.; 12200 Preston Road; Dallas, TX 75230; 1-888-393-2221; www.coopercomplete.com

*Rep-Cal, Rep-Cal Research Labs, Los Gatos, CA 95031 www.repcal.com.

*Vionate Vitamin Mineral Powder – Gimborn Pet Specialties; 2425 West Dorothy Lane; Dayton, OH 45439; 1-800-635-2044; http://gimborn.net

*Nature Made Vit D3 400 IU tablets – Nature Made Nutritional Products; P.O. Box 9606; Mission Hills, CA 91346-9606; 1-800-276-2878; www.naturemade.com

*Vionate (Vitamin Mineral Powder), Gimborn Pet Specialties, LLC Atlanta, GA.

*Nebraska Premium Beef Feline Diet – Central Nebraska Packing, Inc.; P.O. Box 550; 2800 East 8th Street; North Platte, NE 69103-0550 (other similar brands can be substituted)

Life Expectancy in the Wild:	Males:	Unknown	Females:	38 years
Life Expectancy in Captivity:	Males:	Unknown	Females:	43 years

BREEDING INFORMATION:

Age at Sexual Maturity:	Males:	3 years	Females:	3 years

Courtship Displays:	Pairs are highly territorial. Adult males have brown eyes, and adult females have golden-yellow eyes. Adults do not vocalize, but do clatter their bills. The courtship display includes a “flap-dash”, a simultaneous combination of wing-flapping and running or sprinting. The male and female participate in this activity. In zoos, these large, 5 to 6 feet (1.5 – 1.8 meters) tall, storks copulate by standing on the nest. The male stands erect on top of the females back while flapping his wings to maintain balance. This should be considered when constructing the nest platform. The male must have enough height and width if the nest platform is in an enclosed space in order to stand erect and flap his wings while on the female’s back.
Nest Site Description:	In the wild, they nest on top of large trees -- such as Euphorbia ingens, Euphorbia dawei, and Acacia giraffe – creating a large bulky stick nest at the top of a tall tree. The nest is lined with grass, reeds and mud. In zoos, both male and female construct the nest. A sturdy made nesting platform can aid the nesting effort. Elevate the platform at least 4 to 5 feet (1.5 meters). Use dimensions approximately 4 x 4 feet (1.3 X 1.3 meters). A sturdy staircase will help flight restricted birds reach the nest platform from ground level, and will make it easier for the keeper to inspect eggs or chicks. If the nest platform is enclosed, ceilings should be at least 10 feet (3 meters) above the nest platform -- high enough so the male will not strike it with his

head or wings while copulating. The birds will continue to add nesting material even after chicks hatch, and an overzealous bird may accidentally cover a chick with grasses or hay. In U.S. zoos, nest-building typically begins in September.

Front of nest platform 4-5 ft tall (about 1.5 m)

Nest platform with step for flight restricted individuals

Clear hard plastic covering (viewed from yard)

View from inside through to yard

View through nest access door

Back of nest platform for heater, camera, etc.

	The parents demonstrate incubation behavior several days before they lay the eggs, and sit tightly on the empty nest. Adults will defend eggs and chicks, but can be nudged from the nest with a broom for inspections by keepers.
Clutch Size, Egg Description:	Clutch: 1-5 (normally 2-3) Eggs: oval, white to pale blue. Eggs are laid at intervals of 36-48 hours. Mark each egg as laid with a soft lead pencil for easy identification.

Incubation Period: 30-38 days **Fledgling Period:** 63-100 days

Parental Care:

Incubation, by both parents, lasts 31-32 days. Parents may regurgitate water on top of the eggs in warm weather. Chicks hatch asynchronously. Parents may gently place one foot on a hatching egg, perhaps to feel vibrations from the hatching chick. A healthy chick will vocalize strongly while still encased in the shell. To regulate the production of offspring (if faced with limitations of space or personnel), add two artificial eggs to the nest when the third real egg is laid. This results in the female realizing an apparent clutch size of 5 eggs in the nest. She will stop laying more eggs. On the other hand, to increase production of eggs, remove each egg from the nest as soon as it is laid. At the Dallas Zoo, one female produced nine eggs several days when each new egg was removed from the nest shortly after it was laid. In North American zoos egg laying typically begins in the last half of October.

Both parents take care of young. Newly hatched chicks are covered with white down. A few days after hatching, the parents may spend several hours standing in the nest rather than brooding the chick. This behavior was observed at the Dallas Zoo even at temperatures as low as 45°F (8°C) (with no harmful effects to the chick); it is not known if this behavior would continue at even lower temperatures and become problematic.

The parents take turns feeding the chick by regurgitating food close to it on the nest floor. The chick instinctively pecks at the food, and initially misses the food more often than it makes contact. The parent begins re-ingesting the food almost as soon as it is regurgitated. But the chick's coordination improves, and it may eat enough to increase its body weight by 20% to 50% per day for the first 10 days.
Within 45 days after hatching, the parents will carry food items to the nest. By age 60 to 80 days, a captive-hatched chick may leave its nest and feed directly from the food bowl shared with its parents.

In the wild, chicks may not fledge until they are 100 days old. At the Dallas Zoo, parents allowed their chick to feed before they themselves ate – this arrangement was still in place when the chick was one year old, and the parents were incubating a new season's clutch of eggs.

HAND-RAISING:

After hatching, the chick should be allowed to dry off and then moved to a brooder set at 98°F (36°C). The brooder should be disinfected daily - spray on and wipe off. As the chick gets older it will need less heat. The chick will be kept at this temperature for the first full day and then the temperature should be gradually reduced over a period of several days until the brooder temperature reaches 85°F (29°C) sometime in the second week. It is important that the legs stay beneath the chick, and a small bowl padded with cloth towels serves this purpose. Small sticks and hay can also be used to line the bowl. Observe the chick for signs that it may be too hot (lying out-stretched, panting or gaping) or too cold (tucked up tight, shivering) and adjust the brooder temperature as necessary. Temperature plays a direct role in activity level of chick and food digestion.

Access to UV light has shown to be important for bone growth for other species of birds and is believed to be important for long legged birds such as saddle-billed storks. With that thought in mind, efforts should be made to provide the chick with time outside for UV light exposure. The chick should be given a minimum of 20 minutes per day outside. Full sun is preferable, but very warm days may require dappled sunlight so that the chick doesn't get overheated. Since saddle-billed storks typically breed in the winter in the in North America temperature is a factor to consider. Chicks should not be taken outside if the temperature is below 60 F (15 C).

It is essential that the offspring is weighed each morning before the first feeding. This weight provides the basis for the amount of food and supplements provided each day. All food items should be covered in a small bowl with distilled water then warmed to 98°F to 100°F (36°C - 38°C). This added water will provide the chick's fluids. The first moistened food items should be rolled in and coated with the vitamin and mineral powder and offered to the chick. Remaining food items are offered in small bowl, and the chick can be stimulated to eat by tapping the food with tweezers. The crop may not empty completely between feedings, but it should empty every 24 hours and so be empty at first a.m. feed. Be sure the chick's crop is emptying between feedings.

All food bowls and feeding utensils should be disinfected in dilute solution prior to use.

Water will initially be provided with the food the chick is eating. However, as the chick grows it should be offered supplemental water by syringe. Saddle-billed stork chicks in the nest drink water brought by the parents by drinking a stream that is regurgitated over them into the nest. Initially the chick will drink a small amount of water from a small syringe offered at the end of every feeding. Be careful not to over water and cause the chick to regurgitate. Later, when the chick is eating on its own, larger amounts of water should be offered between feedings until it is certain the chick is drinking from its water bowl.

Food percentages offered are based on weight gain trends noted in parent-reared saddle-billed stork chicks and on type of food items offered. Previous hand-reared offspring have shown a weight gain percentage equal to approximately 1/3 of the amount fed. If weight gains are excessive the percentage of food can be adjusted. It is important to note that male saddle-billed storks grow faster than females and individual chicks may not consume the entire amount offered. Please consult with your supervisor if the chick is not consuming the full amount offered. No effort should be made to continue to try to feed a chick that has a full crop and appears satiated.

Every effort should be made to prevent imprinting on humans. Do not hand-raise unless absolutely necessary. Hand-raising was accomplished at the Dallas Zoo, where caretakers used a life-like puppet head to feed and preen the chick. Caretakers also wore a black-and- white fabric costume, complete with hood, to obscure the human form, and loosely mimic an adult saddle-billed stork. No talking was allowed, although the puppet's bill should be clattered. If a puppet is not available feed and weigh the chick from behind a blind. Place a mirror with a lone chick.

STEPS TO REDUCE IMPRINTING:

Saddle-billed storks will imprint readily on their keepers unless efforts are made to reduce this possibility. The following information should be taken into consideration in an effort to reduce imprinting of the chick.
Other steps, in addition to these, may be needed:

1. Prevent the chicks from viewing your full face, wear a hood or feed the chick from behind a drape.
2. All feedings should be conducted with a puppet head resembling the shape and color of adults.
3. When moving the chick from place to place, cover chick with light cloth so it can't see you.
4. No talking when around the chick, especially during feeding times.
5. Make every attempt to insure the only things the chick sees associated with feeding and care are the puppet and your hands.
7. Veterinary procedures are exempt from all of the above. You can handle the chick as you would other birds during a procedure.

Chick Development: Altricial

CAPTIVE HABITAT INFORMATION:

Social Structure in the Wild: Solitary, in pairs or with first year offspring

Social Structure in Captivity: Solitary or in pairs

Minimum Group Size: 2 Maximum Group Size: 2 Adults

Compatible in Mixed Species Exhibits:	Varies	**Comments:**	Note: saddle-billed storks have successfully been housed with other birds and some mammals. However, saddle-bills have also been known to kill other birds. Small antelope such as suni, African white-backed vulture, Egyptian vulture, hooded vulture and ruddy shelduck have cohabitated successfully with these storks even while breeding, egg incubation and rearing offspring. Small waterfowl, ibis, other storks, small pelicans have not been so successful. Caution should be exercised when mixing saddle-bills with other animals. Individual personalities and size of enclosure should be considered. It is strongly recommended that saddle-billed storks not be housed with large hoofed stock such as zebra, okapi, kudu, gemsbok, oryx, eland, sable, roan, pigs, giraffe, elephant, etc. as well as ostrich

Optimal Habitat Size: 1,200 sq feet (130 sq meters)

Management Challenges:	Saddle-billed storks are large, strikingly marked and make attractive birds for public exhibit. Zoos usually flight-restrict them and display them in pairs with African hoofed stock. This arrangement rarely provides saddle-billed storks with the opportunity to express their full behavioral repertoire. It excludes the possibility of flight, and interferes with breeding behaviors. Zoos would best serve saddle-billed storks by keeping them fully flighted in their own enclosed exhibit. A suitable compromise would be to display them full-winged, but feather-clipped, in an open exhibit with certain waterfowl, small vultures and small herbivores such as suni antelope (Neotragus moschatus). Saddle-billed storks require a large raised space to build their nest. Lengthy time required for pair bonding and parental learning challenges. Saddle-billed storks are long-lived and require many years before successful chick rearing occurs.

ADDITIONAL COMMENTS:

An exhibit or enclosure for a pair of saddle-billed storks should be covered to allow flight and have an outdoor area at least 1,200 square-feet (130 square-meters). Two-thirds of the area should be a soft substrate, such as short lawn. Plant bushes or bamboo at the outer perimeter. The remainder should consist of a shallow 12 – 15 inches (20 - 40 centimeter) pool of fresh water exposed to direct sunlight. The birds will regularly bathe, drink, dip food, and display in the water. They also carry water to the nest and regurgitate it for both eggs and chicks.

The outdoor aviary should lead to two small 10 x 10 feet (3 x 3 meters) outdoor holding aviaries -- one for each bird -- which each lead to two small 10 x 12 feet (3 x 4 meters) indoor holding pens. These extra pens are

important when managing an injured or ill bird, and when sheltering the birds from bad weather. Habituate the birds to walk inside the shelter on a daily basis if nocturnal predators are a concern. Do not lock even a compatible pair of saddle-billed storks together inside a shelter, because they may seriously injure one another.

If a pool of cool water is present, saddle-billed storks can readily tolerate temperatures as high as 110°F (40.5° C). However, their feet, legs and facial skin are very susceptible to frostbite and it is highly recommended that these birds be sheltered indoors when the wind-chill temperature will be 30°F (-1°C) or below and higher if precipitation is present or predicted.

Natural sunlight is very important to the well being of saddle-billed storks, especially during growth and development of offspring. Parents stand in the nest several hours each day, and the chicks are exposed to a great deal of sunlight. This is crucial for the production of Vitamin D3, a molecule important in calcium metabolism -- deficiencies in this molecule result in metabolic bone disease (rickets). Therefore, it is very important to expose chicks to a minimum of 20 minutes direct sunlight per day, and to give them adequate vitamin and mineral supplementation.

Saddle-billed storks have been displayed in zoos since 1928, however it would be 66 years before any were reproduced in captivity. In 1994, the Dallas Zoo was the first facility in the world to breed the saddle-billed stork. In 2001 the Dallas Zoo received endorsement from the AZA Ciconiiformes/ Phoenicopteriformes TAG and was approved by WCMC to initiate a SSP and maintain a regional studbook. The saddle-billed stork studbook documents all known individuals and is the basic tool for a long-term captive breeding program.

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