GREATER PRAIRIE-CHICKEN - TYMPANUCHUS CUPIDO

Taxonomy: Kingdom: Animalia Phylum: Chordata Class: Aves Order: Galliformes Family: Phasianidae Genus: Tympanuchus Species: T. cupido

Habitat:

Biomes: Greater Prairie-Chickens largely live in areas that combine small patches of oak woodland and extensive prairie. Most now inhabit mixed-grass and tallgrass prairie (rather than shortgrass prairie) with relatively few trees and with patches of cropland interspersed. For nesting, patches of dense brush are critical, as they provide protection from predators and the elements, while more open areas, with a greater abundance of insects, are necessary for hens foraging with their chicks. Males display on open, elevated, flat areas, in part so that prairie-chickens can detect predators both on the ground and in the air. During the winter, prairie-chickens occupy much the same habitats but are often found near croplands that provide supplemental food; winter roost sites are mostly in brushy areas. Modern agriculture has reduced and fragmented these habitat types, leading to sharp declines in populations. South of the Great Plains, in the sandy Gulf coastal plain, oak savannas (now rare) were habitat for Attwater's Prairie-Chicken. The extinct Heath Hen apparently favored scrub oak with openings created by fire or natural barrens.

Distribution:

In US: Greater Prairie-Chicken is a year round resident in disjunct populations from e. North Dakota into w. Minnesota and central South Dakota, south through Nebraska and into n. and e. Kansas and ne. Colorado, w.-central and nw. Missouri, ne. Oklahoma, s.-central Illinois and central Wisconsin (Svedarsky et al. 1999a, Svedarsky et al. 2000). The extent of overall connectivity in the core of its range -- ne. Oklahoma, Kansas, Nebraska and South Dakota -- is not known. In contrast, populations in Wisconsin and Illinois are isolated (Westemeier et al. 1998, Johnson et al. 2003, Johnson and Dunn 2006, Bouzat et al. 2009), with efforts currently being made to reconnect populations in Minnesota and North Dakota with those in South Dakota.

In Other Countries: NONE

Holistic Description: Few performances in the bird world are more memorable than the dawn display of Greater Prairie-Chickens at their booming ground, or lek—the traditional spot where males dance, call, and try to impress females with their vigor. When displaying, the males erect earlike plumes on the head and blow up bright orange air sacs on the neck, transforming themselves from brownish chicken like birds into brightly colored performers, all the while drumming with their feet and producing whooping and cackling calls.

Species Richness: 3 SUBSPECIES

Population Dynamic: NONE

Evolution and Systematics:

Evolution: Ten prehistoric and one Pleistocene records are given for T. cupido by Brodkorb. However, several additional late Pleistocene records for this species are of considerable interest because of their more southern localities.

Systematics: Body size tends to decrease both west to east and north to south, with the smallest birds at the southern end of the range. Plumage variation is complex. In general, the palest birds are on the Great Plains, whereas birds (formerly) in the Northeast were more rufescent and boldly marked. Tarsus feathering is reduced in the south. The number of feathers constituting the pinnae are fewer in the east and are more pointed at the tips. Three subspecies that differ either in plumage coloration, size, and extent of feathering. These subspecies differ genetically to some extent

Number of Species: CHECK SYSTEMATICS AND SPECIES RICHNESS

Number of Genera: CHECK SYSTEMATICS AND SPECIES RICHNESS

Physical Characteristics:

Size and Length: Length: 16.9 in (43 cm) Weight: 31.9-36.1 oz (904-1024 g)

Wingspan: 27.4-28.5 in (69.5-72.5 cm)

Coloration: Mottled brown, rufous, black, and white above, barred brown and white below.

General Body Features: NONE

Special Features of the Body: The male prairie chickens have large orange air sacks on their neck and also have bright orange eyelashes to attract mates.

Special Features of the Head and Sensory Organs: They are omnivores and they feed on fruits and seeds. They also feed on insects such as grasshoppers, ants, etc. In winter, they become totally herbivorous due to the lack of insects.

Dentition: BEAK AND DIET

Special Features of the Limbs and Digits: These birds are not perturbed by the rough winters. They have adapted well to the snow. There are tough projections of skin on their feet, this helps them to walk through the snow. These birds dig into the

snow, around 10 inches. After that they make a horizontal tunnel. This tunnel functions as an Igloo and, in a way, insulates them from external freezing temperatures.

Any Special Internal Anatomy: The prairie chicken uses its air sack to make booming and clucking noises to attract a mate, the male chickens also stomps their feet and fight off each other to get a mate. The prairie chickens have adapted to snow by being able to dive in it to keep warm.

Sexual Dimorphisms: Males have a barred brown-and-white chicken like grouse with a small head, rounded wings, and short tail. Males also have orange patches on both sides of their neck. Females have a dark eyeline and a pale throat.

Differences Between Juvenile Stage and Adult: Plumage in being cryptically patterned, but feathers weak and more heavily marked with bars and spots; secondaries with outer web barred and mottled buff; rectrices shorter (< 90 mm) and weaker. Sexes can be separated by the presence (females) or absence (males) of bars to the outer rectrices.

Behavior:

Diurnal, Nocturnal, or Crepuscular: Diurnal

Activity: Prairie-chickens walk slowly through habitats, pecking at seeds and grains on the ground and gleaning insects. To obtain buds and fruits, they occasionally feed in trees. They are strong fliers and frequently make flights of several miles between roosting and feeding areas. In early spring, often with snow still on the ground, males begin to assemble on small areas called leks, dancing grounds, or booming grounds. Here, in what is known as a lek mating system, males defend small territories and together perform their spectacularly odd “booming” displays: extending their orange eye combs, lowering the head, raising two tufts of feathers on the neck, and pointing the tail slightly forward. They then stamp their feet on the ground, clicking their tails, shaking and lowering wings until they touch the ground. They expanding bright orange air sacs in the neck (reminiscent of a frog inflating its throat) to produce a booming vocalization. Males clash relentlessly at these gatherings, chasing each other, leaping into the air and striking with wings, feet, and bills, but they also have ritualized standoffs that minimize bloodshed. When females arrive at the lek to observe males, the dancing goes into high gear. Males sometimes bow to nearby females and may perform “flutter jumps”—leaping into the air while flapping their wings, often in combination with whoops, cackles, or whines. Females sometimes make similar jumps. They occasionally warn off other females by raising their tail and pinnae (feather tufts) and drooping the wings. In the lek system, only a few males, mostly experienced older males, are accepted by females for mating. Those with the largest eye combs, longest legs, and best territories (nearest the center of the booming ground) appear to have the best breeding success. No pair bond is formed, and males have no role in selecting nest sites or rearing young. After the breeding season, grouse gather in flocks in autumn.

Locomotion: Generally walk while feeding; frequently fly between breeding, feeding, nesting, loafing, and roosting sites. When disturbed, generally fly. Sustained flights of ≥ 11 km possible between islands of suitable habitat; speed estimated at 67 km/hr. Not known to swim or dive.

Communication and Perception: The low booming of displaying males is made by air passing through the syrinx and amplified by the inflating air sacs, which are extensions of the esophagus. Displaying males also give cluck, whoop, whine, and cackle. Females make a kuk call in interactions with other adults, a brirrrb call when gathering their chicks, and a kwerr call when warning them about predators.

Home Range: Males maintain territories on booming grounds during the breeding season. Booming grounds generally located in areas accessible to numerous females, often on small rises or knolls exposed by prominent topography and/or lack of vegetation. Territories consist of a core area in which other males are rarely encountered and a boundary area in which aggressive interactions with other males are common; average territory size 518 m^2.

Degree of Sociality: Highly social. Males form flocks associated with specific booming grounds during the breeding season. Females often visit booming grounds in small groups, and remain in flocks until they begin to nest. Mixed flocks of both sex and age classes are largest during late autumn and winter, up to 300 birds. Flock size is greatest during mornings and cold weather.

Level of Aggression: During the breeding season males congregate on relatively small display sites or booming grounds (i.e., leks). Males actively defend territories on booming grounds from intruding males. During aggressive encounters with other males, males lower their pinnae feathers, deflate their air sacs, leap into the air, and strike their opponent with feet, wings, and/or beak. Chases are common. Most intense aggressive interactions between males on booming grounds occur when females are present. Fights between males occasionally result in death of a combatant. Chases and displacements common among females visiting booming grounds during the breeding season. Females threaten other females by assuming an elongated posture with primaries dropped slightly, tail and pinnae vertically erected.

Migration: Most populations are considered non-migratory; a portion of the population remains resident on the same area throughout the year while others move 1–170 km between wintering and breeding areas.

Predators:

Predators: **Adults and Chicks**: Rough-legged hawk, red-tailed hawk, ferruginous hawk, broad-winged hawk, northern harrier, northern goshawk, cooper's hawk, bald eagle, golden eagle, american kestrel, gyrfalcon, peregrine falcon, prairie falcon, snowy owl, weasel, mink, badger, red fox, gray fox, coyote, red wolf, dog, and cat. **Eggs**: fire ant, various snakes, Great Horned Owl, American Crow, opossum, ground squirrel, striped skunk, weasel and mink, badger, raccoon, red fox, coyote, red wolf, wild boar, dog, and cat.
Anti-Predator Defenses: When a ground predator is detected, adults usually assume an alert upright posture and remain motionless with necks fully extended; birds may also assume a semi-alert posture with neck not fully extended. In response to an avian predator, birds often squat on the ground and remain motionless; flock members and brood hens may utter warning calls. Birds fly if the threat is serious.

Diet and Nutrition:

Adult Diet: Greater Prairie-Chickens eat leaves, seeds, buds, fruits, acorns, cultivated grains such as corn, sunflower, soy, and sorghum, and insects such as grasshoppers, crickets, and beetles. Attwater's Prairie-Chickens eat native plants but relatively little in the way of cultivated grains. Prairie-chickens forage mostly on the ground but may also climb into trees to eat buds and leaves, especially when snow limits access to food on the ground. Chicks eat mostly insects.
Juvenile Diet: Adult diet based on stomach contents in Attwater's consisted of 84.6% plant material and 13.2% insects (n=18); diet of two chicks and a juvenile consisted of 92.3% insects.
Special Adaptations for Getting Prey: Ingest grit to grind food items; amount of grit in the gizzard averages 7.3% of total items.

Reproduction:

Mode of Reproduction: polygynous mating system
Mating System: Here, in what is known as a lek mating system, males defend small territories and together perform their spectacularly odd "booming" displays: extending their orange eye combs, lowering the head, raising two tufts of feathers on the neck, and pointing the tail slightly forward. They then stamp their feet on the ground, clicking their tails, shaking and lowering wings until they touch the ground. They expanding bright orange air sacs in the neck (reminiscent of a frog inflating its throat) to produce a booming vocalization. Males clash relentlessly at these gatherings, chasing each other, leaping into the air and striking with wings, feet, and bills, but they also have ritualized standoffs that minimize bloodshed. When females arrive at the lek to observe males, the dancing goes into high gear. Males sometimes bow to nearby females and may perform "flutter jumps"—leaping into the air while flapping their wings, often in combination with whoops, cackles, or whines. Females sometimes make similar jumps. They occasionally warn off other females by raising their tail and pinnae (feather tufts) and drooping the wings. In the lek system, only a few males, mostly experienced older males, are accepted by females for mating. Those with the largest eye combs, longest legs, and best territories (nearest the center of the booming ground) appear to have the best breeding success. No pair bond is formed, and males have no role in selecting nest sites or rearing young. After the breeding season, grouse gather in flocks in autumn.
Mating Season: Late March throughout April.
Courtship: Males perform Flutter Jump when females visit booming grounds; they leap into the air while flapping their wings, often in combination with whoop, cackle, or whine calls. Birds perform an average of 11.8 booming displays/min when females are present and 8.2/min when females are absent. Males often strut, performing the booming display but without actually booming. They may give a Nuptial Bow when close to a female prior to a copulation attempt; male remains prone with tail erect and wings spread laterally and down while bill touches ground.
Mating: Females solicit copulation by squatting and dropping their wings slightly. After solicitation, the male approaches the female from the side and/or rear and stands on her back while grabbing her neck feathers. Both birds hold wings downward and outward during copulation; female's wings may quiver. Males can perform booming display while on female's back. Successful copulations are a few seconds in duration followed by characteristic shaking, ruffling, and/or preening by female. Often times, other males in close proximity on the booming ground will attempt to dislodge a male from a female during copulation. Females leave the booming ground soon after copulating.
Nesting: Females select the nest site in grassland with brushy cover, usually with vegetation 10–28 inches high. The nest is a bowl-shaped depression lined with feathers, dried grass, leaves, and small twigs, averaging about 7 inches wide and 2.8 inches deep.
Egg-Laying: Clutch Size: 5-17 eggs Number of Broods: 1 brood Egg Length: 1.6-1.7 in (4.1-4.4 cm) Egg Width: 1.2-1.3 in (3.1-3.2 cm) Incubation Period: 23-25 days Egg Color:
Hatching and Incubation/Gestation: Background tawny olive to pale horn color. Speckles of burnt umber or raw umber throughout egg. Although speckles may be up to 2 mm in diameter, they are usually smaller and occasionally absent. Eggs may become dull and shiny with age.

Development: Daily movements of 0.3 km are typical for young chicks and movements of 2 km for older chicks; chicks occasionally become detached from brood because of loose feeding formations. Chicks can perform weak flights by 2 wk of age (approximately 5% of mature body mass) and relatively strong flights of about 35 m at 3 wk. GROWTH IS RAPID
Parental Care: During 1st wk chicks brooded by hen about 50% of daylight hours; rarely brooded after 2 wk of age. Brooding hens squat low with wings drooped and lower feathers ruffled; chicks sit underneath hen's wings or breast feathers.
Lifespan: 2-3 years

Conservation:

Official Federal Status: Vulnerable
Special Statuses in Individual States: NONE
Threats: Greater Prairie-Chicken numbers declined severely in the nineteenth and early twentieth centuries, but they have been stable during the period 1966 to 2015, according to the North American Breeding Bird Survey. Partners in Flight estimates a global breeding population of 360,000 and rates the species a 16 out of 20 on the Continental Concern Score, placing it on the Red Watch List. It is listed as Vulnerable on the IUCN Red List of Threatened Species. The Greater Prairie-Chicken has an unusual status as a species of high conservation concern, but one that is also legally hunted. Heath Hen, the distinctive form endemic in the East, became extinct in 1932. The distinctive Attwater's Prairie-Chicken, formerly abundant in the coastal Plain of western Gulf states, is now federally listed as Endangered and at severe risk of extinction, limited to three small sites in Texas. Greater Prairie-Chickens are vulnerable to loss and fragmentation of prairie habitat through conversion to cropland and other uses such as wind energy development. Cows also modify its prairie habitat. Competition with the introduced Ring-necked Pheasant is likewise a concern for this species. Hunting of the species continues in South Dakota, Nebraska, Kansas, North Dakota, Minnesota, and Colorado, and studies confirm these hunted populations have lower overall survival rates than elsewhere. In the 1980s and 1990s, agricultural lands planted with grasses and forbs under the Conservation Reserve Program helped populations, increasing both nesting and brood-rearing habitat, especially when these plantings occurred near native grasslands.
Conservation Efforts: ^^^

Extra Facts:

1. Some booming grounds or leks have been used for more than a century and are considered “ancestral,” whereas others, more recently established, are called “satellite” areas. When prairie-chicken populations are low, most males assemble at ancestral areas, but during periods of higher populations the satellite areas may contain many males (especially younger ones).
2. Males’ territories within the booming ground appear to be oriented according to marks in the terrain such as depressions, drainages, fences, cow droppings, and wheel tracks. Modifying these features can result in males modifying the shapes of their territories.
3. The extinct Heath Hen was a subspecies (cupido) of Greater Prairie-Chicken that inhabited the Eastern Seaboard from Maryland to Massachusetts in the colonial era. Excessive hunting of this bird led to restrictions as early as 1791, but even so declines continued. The last Heath Hen died on Martha’s Vineyard, Massachusetts, in 1932.
4. Greater Prairie-Chickens occasionally hybridize with Lesser Prairie-Chickens. Male hybrids produce a booming sound that is intermediate in frequency between the two species.

Notable Species:

There are three subspecies;

1. The heath hen, Tympanuchus cupido cupido, which was historically found along the Atlantic coast, is extinct. It was possibly a distinct species; in this case the two other forms would be T. pinnatus pinnatus and T. p. attwateri.
2. Attwater's prairie chicken, T. c. attwateri is endangered and restricted to coastal Texas.
3. The greater prairie chicken, T. c. pinnatus, is now restricted to a small section of its former range.