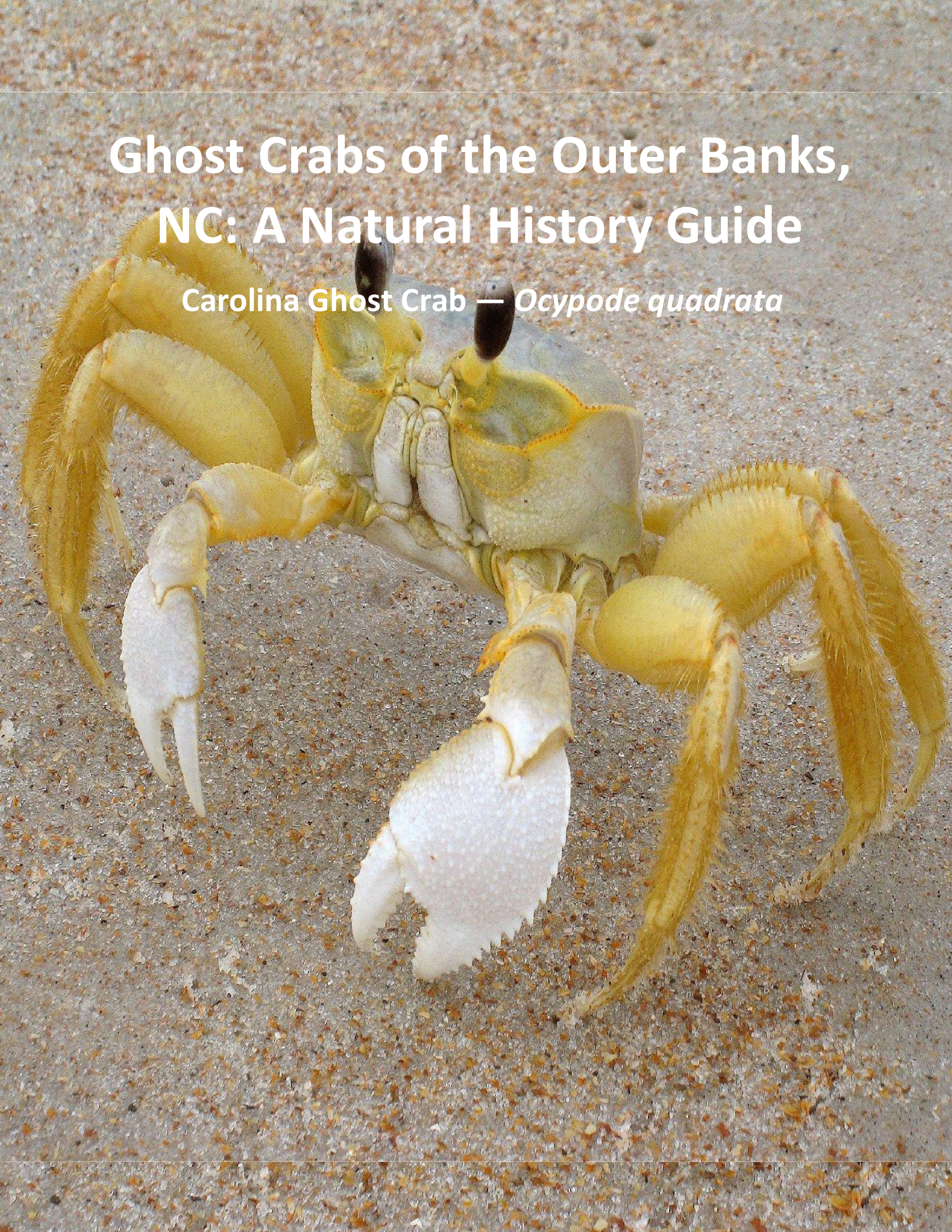
Ghost Crabs of the Outer Banks, NC: A Natural History Guide

Carolina Ghost Crab — *Ocypode quadrata*



Forward

This pamphlet was created by the Outer Banks Coastal Conservation (OBCC), a nonprofit organization whose mission is to foster environmental stewardship and a deeper connection to the Outer Banks of North Carolina through outreach, education, and conservation efforts.

We believe that small stories can spark big change. That is why we have made this book available as a free resource for parents, teachers, and community members.

All materials in this pamphlet may be freely downloaded, shared, printed and used for educational or nonprofit purposes.

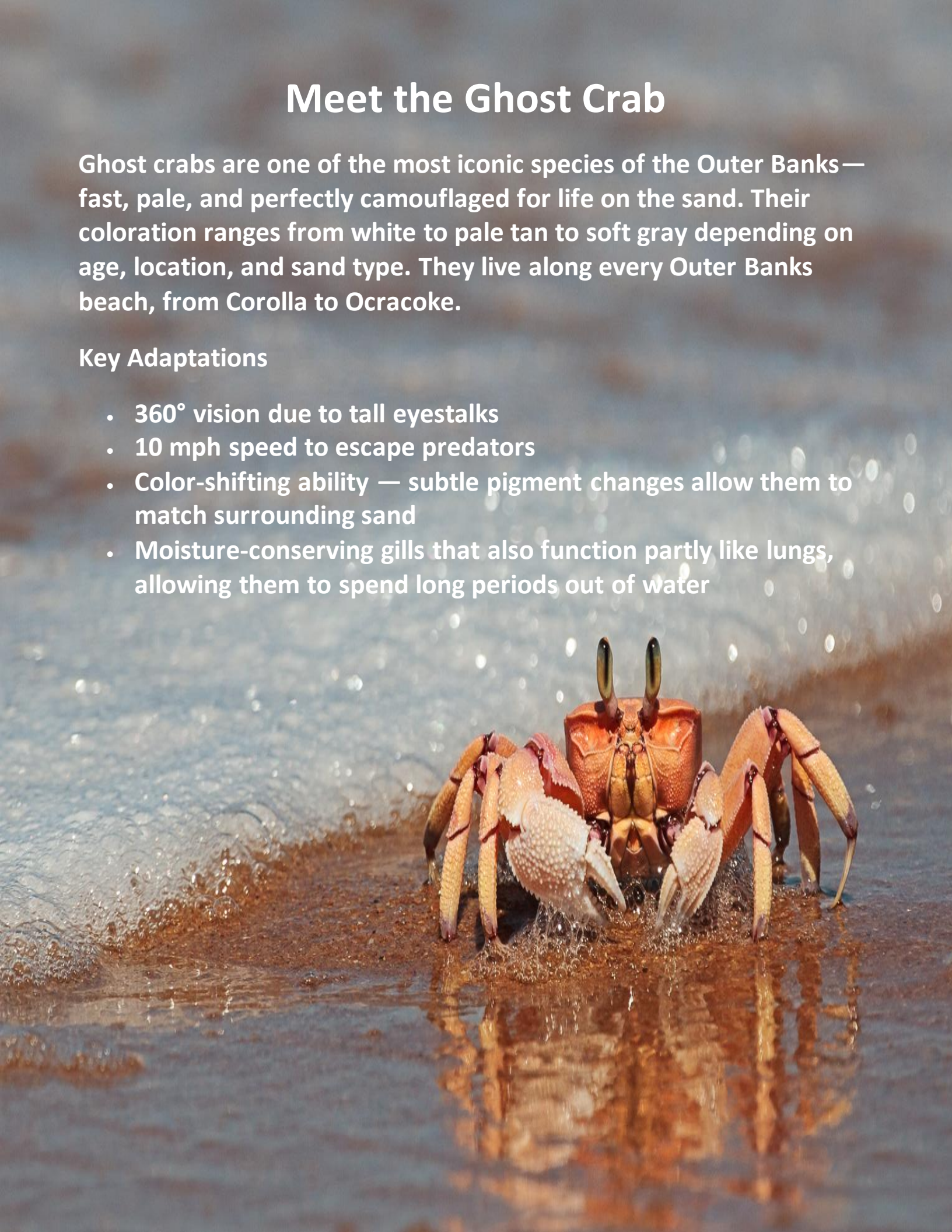
To learn more, access additional resources at: www.theobcc.org.

Meet the Ghost Crab

Ghost crabs are one of the most iconic species of the Outer Banks—fast, pale, and perfectly camouflaged for life on the sand. Their coloration ranges from white to pale tan to soft gray depending on age, location, and sand type. They live along every Outer Banks beach, from Corolla to Ocracoke.

Key Adaptations

- **360° vision due to tall eyestalks**
- **10 mph speed to escape predators**
- **Color-shifting ability — subtle pigment changes allow them to match surrounding sand**
- **Moisture-conserving gills that also function partly like lungs, allowing them to spend long periods out of water**



Why Ghost Crabs Dig Burrows

Ghost crab burrows are essential for survival. They are not random holes — they are carefully engineered.

Burrow Functions

1. Temperature Control
   Their burrows stay 20–30°F cooler than the surface sand on hot afternoons.
2. Moisture Reservoir
   Burrows maintain humidity for their gills. Ghost crabs must keep their gills moist to breathe.
3. Protection From Predators
   Burrows provide safe retreats from:
   - gulls
   - foxes
   - raccoons
   - ghost crab cannibalism
4. Nighttime Launch Site
   Crabs emerge around dusk to forage, then return to the same burrow before sunrise.
5. Nursery Burrows
   Females sometimes create special, deeper burrows to protect eggs until spawning.

Burrow Structure

- Typically 3–4 feet deep (sometimes deeper in loose dune sand)
- One main shaft, but sometimes two entrances
- “Spoil piles” show fresh digging (visible indicators of crab activity)

What Ghost Crabs Eat

Ghost crabs are opportunistic omnivores and scavengers, playing a huge role in nutrient cycling on the beach.

Main Food Items

- **Mole crabs (“sand fleas”) — a favorite food source**
- **Coquina clams**
- **Small fish or injured fish in surf wash**
- **Dead marine animals (fish, crabs, birds)**
- **Seaweed and organic debris**
- **Insects and beach hoppers**
- **Turtle eggs and hatchlings if nests are unprotected**

Feeding Behaviors

- **They use their larger claw to tear food into small pieces.**
- **They hunt by vibration detection — feeling prey moving under sand.**
- **They scavenge the wrack line at night.**

Their role as a clean-up crew makes beaches healthier and helps prevent disease spread in carcasses.

Life Cycle & Reproduction

Ghost crabs have fascinating life stages tied to the tides and seasons.

Mating Season

- Late spring through early fall (April–September)
- Males court females by drumming their claws and performing a waving display.

Egg Production

- Females carry up to 100,000 eggs under their abdomen.
- Eggs turn dark as they mature.

Spawning

- Occurs in the surf zone at night.
- Females release larvae into breaking waves during high tide.

Larvae (Zoea Stage)

- Microscopic, shrimp-like larvae drift in the plankton for 4–6 weeks.
- Currents carry them through Pamlico and Albemarle waters.

Juvenile Settlement

- Young crabs return to the beach as tiny, transparent mini-crabs.
- They dig their first burrows high on the beach and spend much of the day hiding from predators.

Lifespan

Ghost crabs live 3–4 years, sometimes longer in undeveloped beaches.

Do Ghost Crabs Hibernate in Winter?

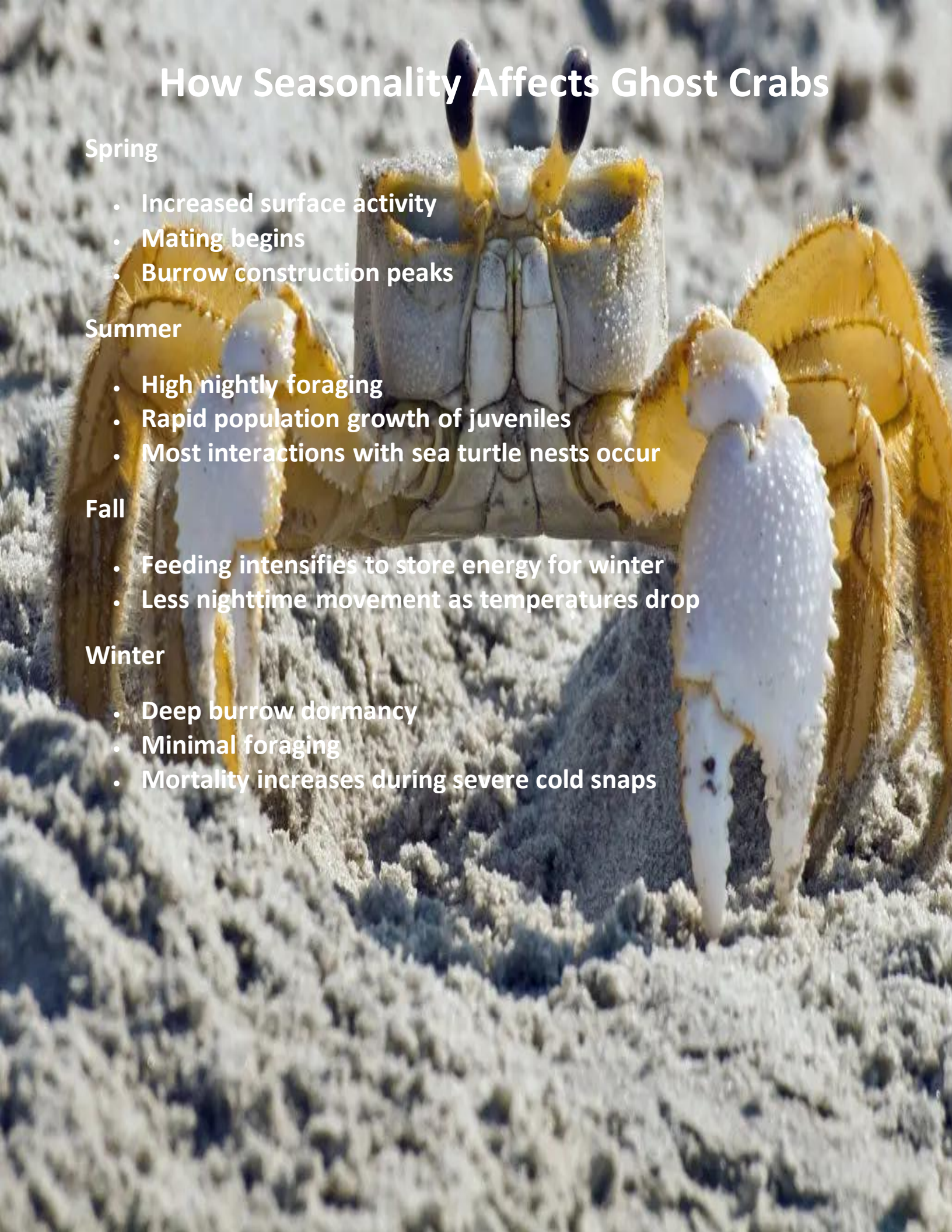
Not exactly — but they enter a low-activity state.

Winter Behavior

- **Ghost crabs remain in their burrows during cold months.**
- **They dig deeper burrows to reach sand with stable temperatures.**
- **They slow their metabolism but do not fully hibernate.**
- **On warmer winter days, they may emerge briefly to forage.**

Cold limits their activity because they are ectothermic (cold-blooded).

How Seasonality Affects Ghost Crabs



Spring

- Increased surface activity
- Mating begins
- Burrow construction peaks

Summer

- High nightly foraging
- Rapid population growth of juveniles
- Most interactions with sea turtle nests occur

Fall

- Feeding intensifies to store energy for winter
- Less nighttime movement as temperatures drop

Winter

- Deep burrow dormancy
- Minimal foraging
- Mortality increases during severe cold snaps

Predators of Ghost Crabs

Ghost crabs must navigate a beach full of hunters.

Major Predators

- **Gulls, herons, and pelicans**
- **Red foxes**
- **Raccoons**
- **Coyotes**
- **Other ghost crabs (cannibalism is common)**

Young crabs suffer the highest mortality.

Ghost Crabs & Sea Turtles

While part of the natural ecosystem, ghost crabs do prey on vulnerable nests.

Impacts on Sea Turtles

- **They may tunnel into nests and consume eggs.**
- **They prey on hatchlings as they emerge.**

Conservation Actions

Biologists use protective screens to reduce egg predation while allowing ghost crabs to move freely. This balance protects turtles without harming the beach's natural ecology.

Ghost Crabs as Indicator Species

Ghost crabs are one of the best biological indicators of beach health. Their numbers reflect:

- **Off Road Vehicle traffic levels**
- **Human nighttime activity**
- **Beach nourishment depths**
- **Dune stability**
- **Abundance of mole crabs and wrack**
- **Level of beach grooming/raking**

Healthy beaches = thriving ghost crab populations.

Threats They Face

Beach Nourishment

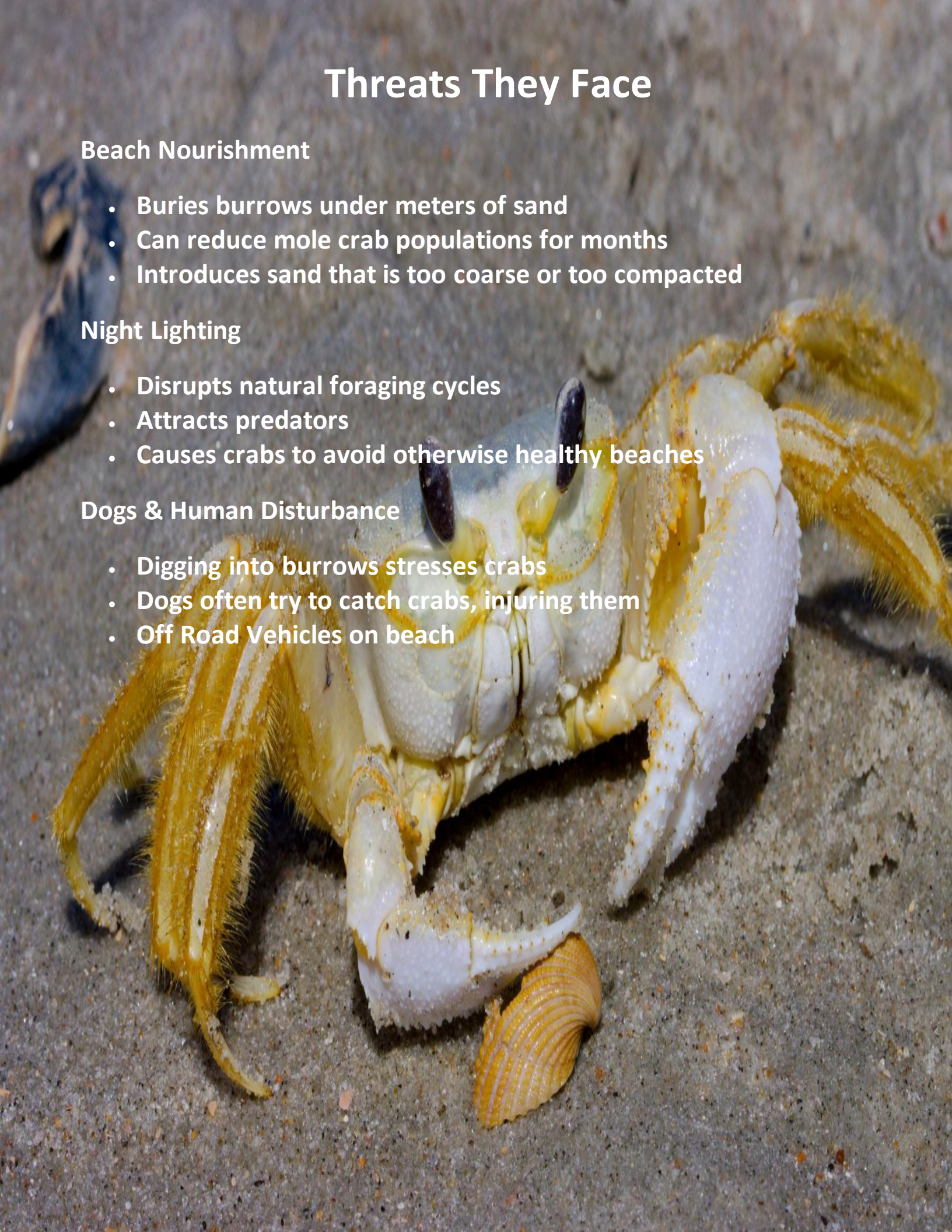
- Buries burrows under meters of sand
- Can reduce mole crab populations for months
- Introduces sand that is too coarse or too compacted

Night Lighting

- Disrupts natural foraging cycles
- Attracts predators
- Causes crabs to avoid otherwise healthy beaches

Dogs & Human Disturbance

- Digging into burrows stresses crabs
- Dogs often try to catch crabs, injuring them
- Off Road Vehicles on beach



Beach Etiquette for Ghost Crab Habitat

Do:

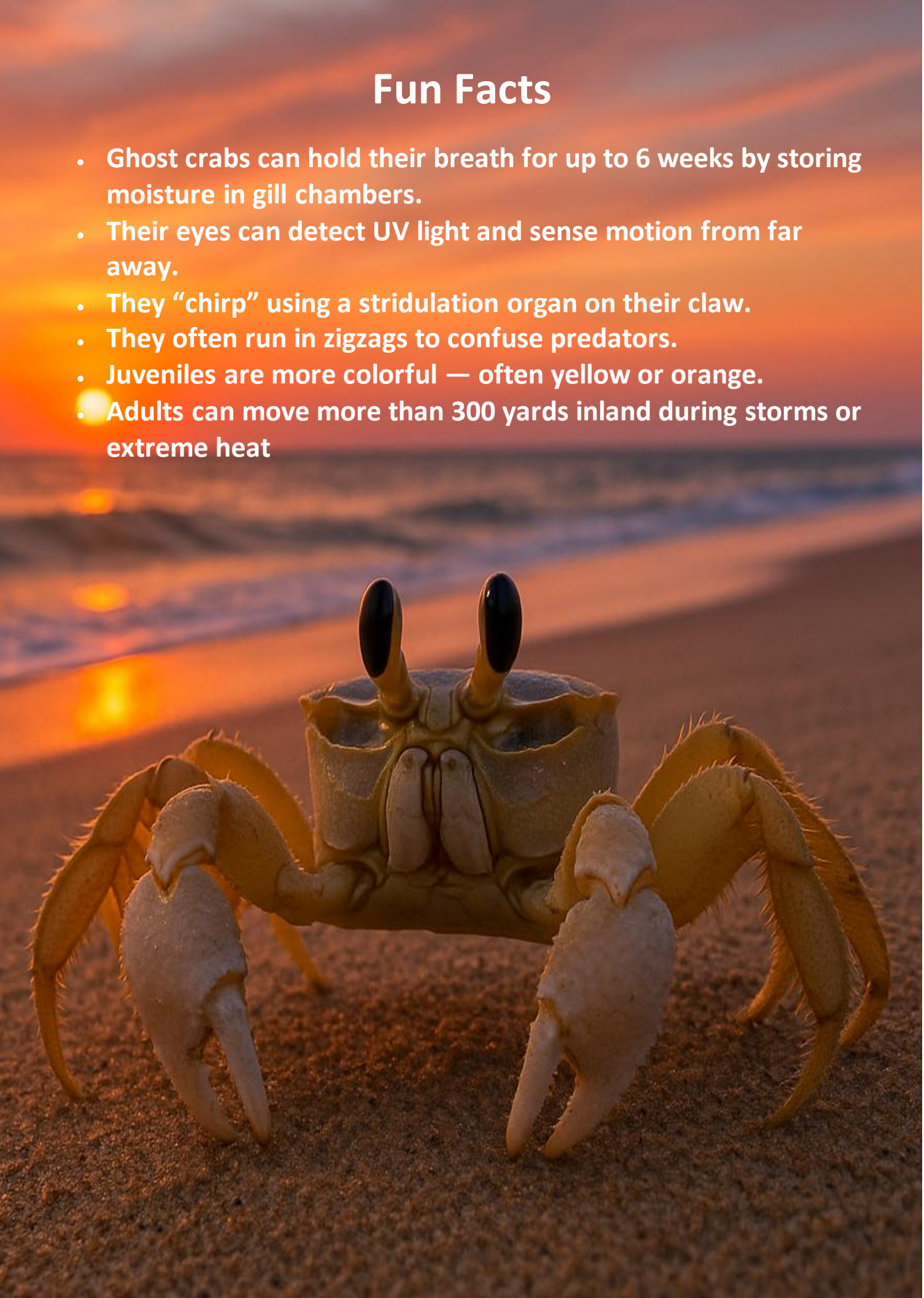
- Use red-light flashlights at night
- Walk close to the wet sand to avoid burrows
- Leave wrack (organic debris) for food and habitat
- Fill in any large holes dug on the beach
- Walk gently near dunes
- Observe from a distance
- Use red lights at night
- Leave natural debris (seaweed, driftwrack) untouched
- Educate children about not digging up burrows

DO NOT:

- Chase or catch ghost crabs
- Pour water into holes
- Drive over soft upper-beach zones
- Dig large holes that crabs can fall into
- Leave trash or food scraps on the beach
- Use bright flashlights
- Walk on dunes where many burrows are concentrated

Fun Facts

- Ghost crabs can hold their breath for up to 6 weeks by storing moisture in gill chambers.
- Their eyes can detect UV light and sense motion from far away.
- They “chirp” using a stridulation organ on their claw.
- They often run in zigzags to confuse predators.
- Juveniles are more colorful — often yellow or orange.
- Adults can move more than 300 yards inland during storms or extreme heat



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