

Is Shell Collecting HARMFUL?

A SCIENTIFIC LOOK AT COASTAL CONSERVATION

— UNDERSTAND. RESPECT. PROTECT. —



HABITAT
FOR MARINE LIFE



BEACH STABILITY
AND DUNE HEALTH



SUPPORTS
SHOREBIRDS

• ECOSYSTEM
CONNECTIONS

• SCIENCE-BASED
INSIGHTS

• RESPONSIBLE
CHOICES



OBCC
OUTER BANKS
COASTAL CONSERVATION

— OUR COAST. OUR WILDLIFE. OUR FUTURE. —

Is Shell Collecting Harmful?: A Scientific Look at Coastal Conservation

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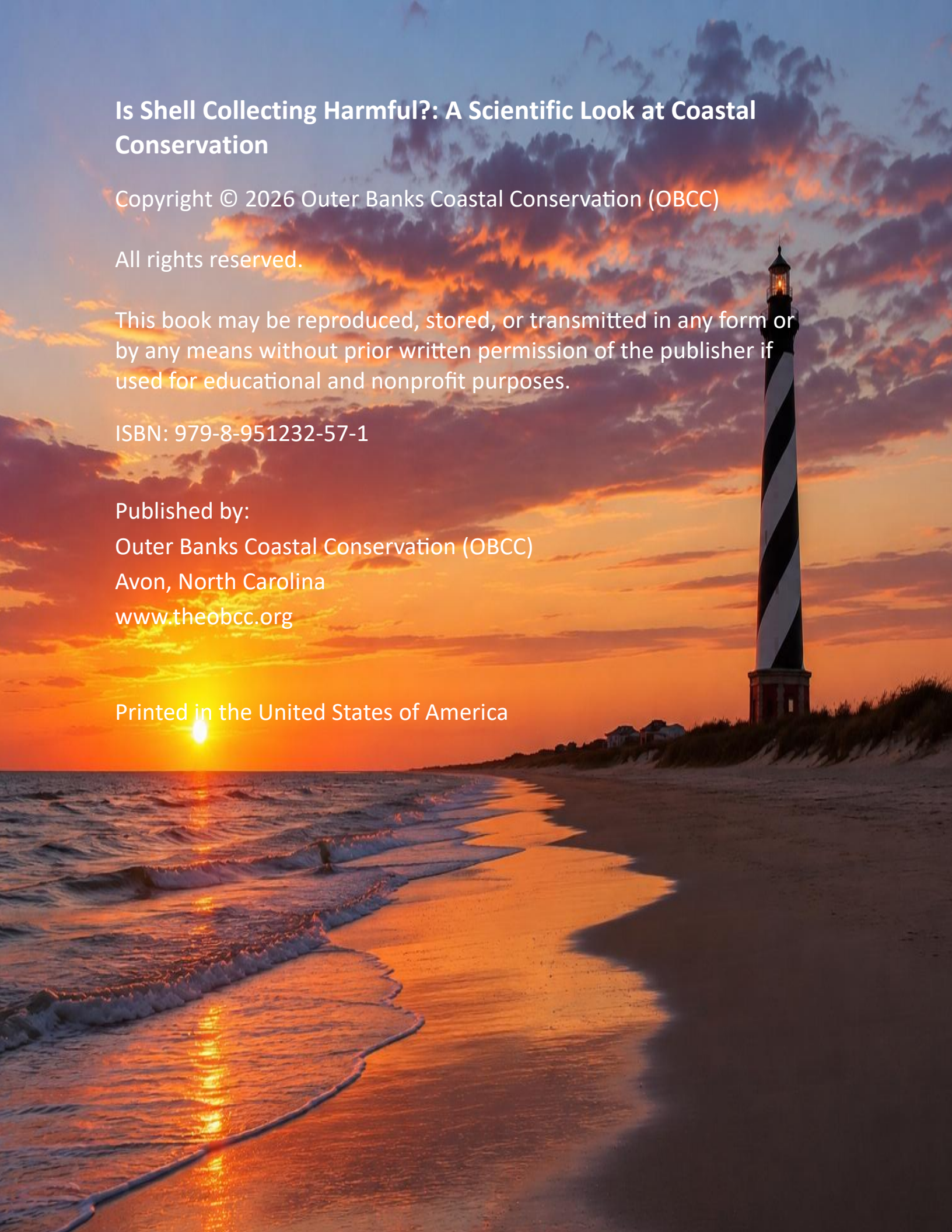
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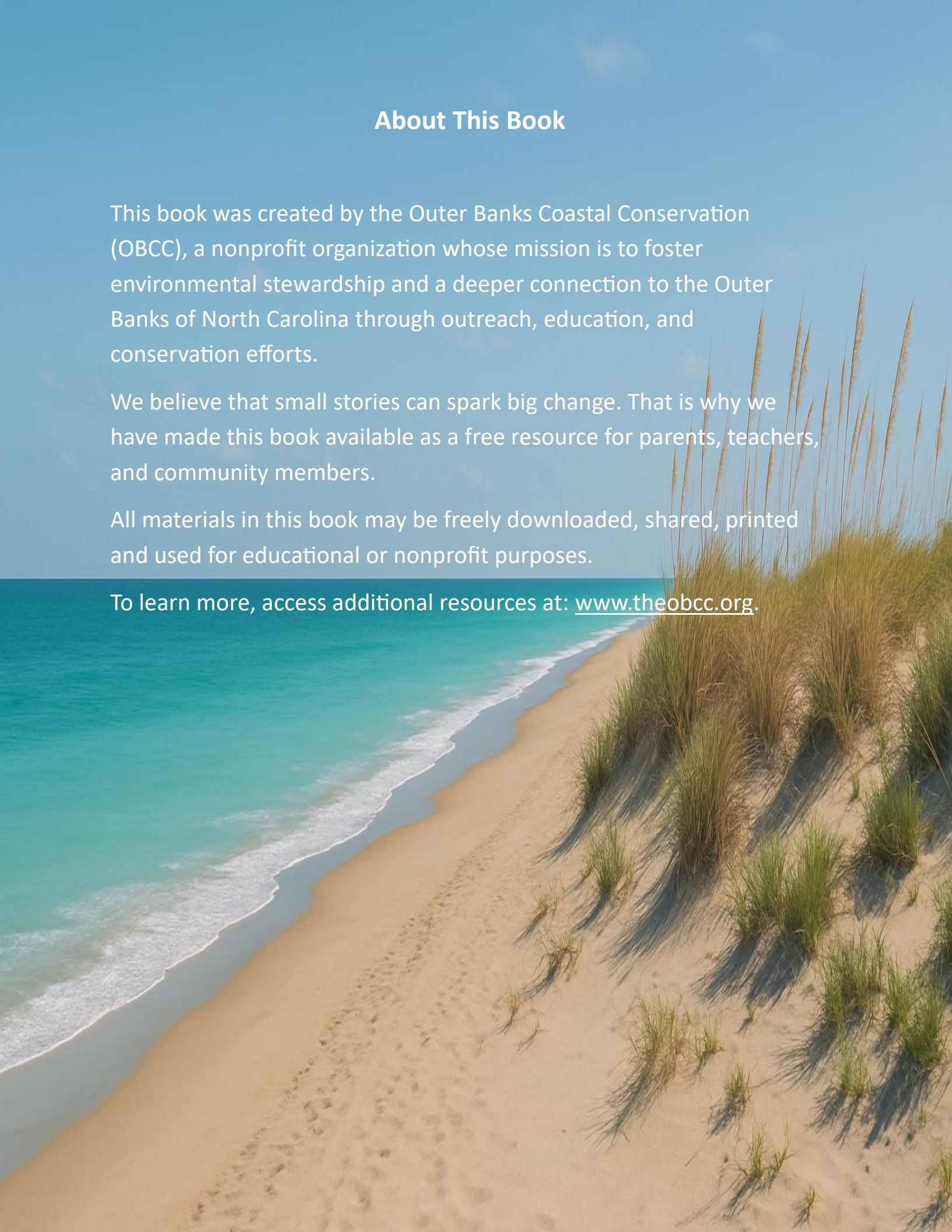
About This Book

This book 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 book may be freely downloaded, shared, printed and used for educational or nonprofit purposes.

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



Introduction

Shell collecting is a beloved beach tradition on the Outer Banks. But as coastal science evolves, conservationists are learning that shells are not just pretty souvenirs — they're active parts of a living coastal ecosystem. Collecting shells responsibly is absolutely possible, but understanding the system helps you make mindful choices.



Why Shells Matter Ecologically — Even When “Empty”

Many beachgoers assume that an empty shell is simply waste left behind by a mollusk. But shells continue to serve important ecological functions long after the animal has died.

Shells contribute to a healthy shoreline in several ways:

A. Habitat for Marine Life

Empty shells provide homes or hiding places for:

- Hermit crabs
- Juvenile fish
- Small shrimp and amphipods
- Worms and tiny invertebrates
- Oyster drills and moon snails

Removing shells reduces these micro-habitats.

B. Beach Stability & Sand Formation

Shell fragments:

- Help anchor sand, slowing wind erosion
- Become part of dune formation
- Add calcium carbonate to the beach sediment
- Reduce how quickly soft sand washes away

Over time, lots of removed shells means less material to build dunes and berms.

C. Benefits to Shorebirds

Species like plovers and sandpipers use shell beds to:

- Camouflage eggs
- Hide from predators
- Forage for tiny invertebrates hiding in shells

No shells → fewer safe nesting and feeding spots.

Are "Empty" Shells Really Deceased?

Not always.

A shell may be "empty" to the eye, but it can still contain:

- Microalgae
- Bryozoans
- Polychaete worms
- Baby periwinkles
- Early-life stages of mollusks

Even a thin smear of organic film supports microscopic ecosystems.

Shells on the beach are rarely biologically useless.



The Conservation Problem: Quantity, Not Individual Shells

Collecting a few shells has virtually no impact.

The real concern is:

- Bucket collecting
- Commercial-scale removal
- Crafting businesses taking shells in bulk
- Visitors removing large volumes daily during summer tourism

Research in Florida, Spain, Portugal, Australia, and Hawaii shows:

- Up to 60% decline in shell abundance in heavily collected beaches
- Declines in hermit crab populations
- Fewer shell-based microhabitats
- Increased dune erosion in shell-poor beaches

While the Outer Banks is not yet facing a crisis, the warning signs from other beaches apply here too.

Conservation Guidelines: What's Responsible on the Outer Banks?

Here are the widely accepted principles used by:

- National Park Service
- Coastal state park systems
- Marine biologists
- Leave No Trace organizations

✓ Responsible Practices

- Take only a small handful
- Prefer broken shells for crafts
- Never collect live animals
- Leave rare shells (e.g., perfect scotch bonnets, large lightning whelks)
- Avoid collecting near dune vegetation, wrack lines, or bird nesting areas
- Teach children “one special shell per day”

✗ Avoid

- Removing buckets-full
- Taking giant intact whelk shells
- Collecting at wildlife refuges or roped-off areas
- Removing shells from tide pools (often living organisms inside)
- Taking shells with hermit crabs — even tiny ones



How Shell Collecting Interacts with Erosion & Coastline Health

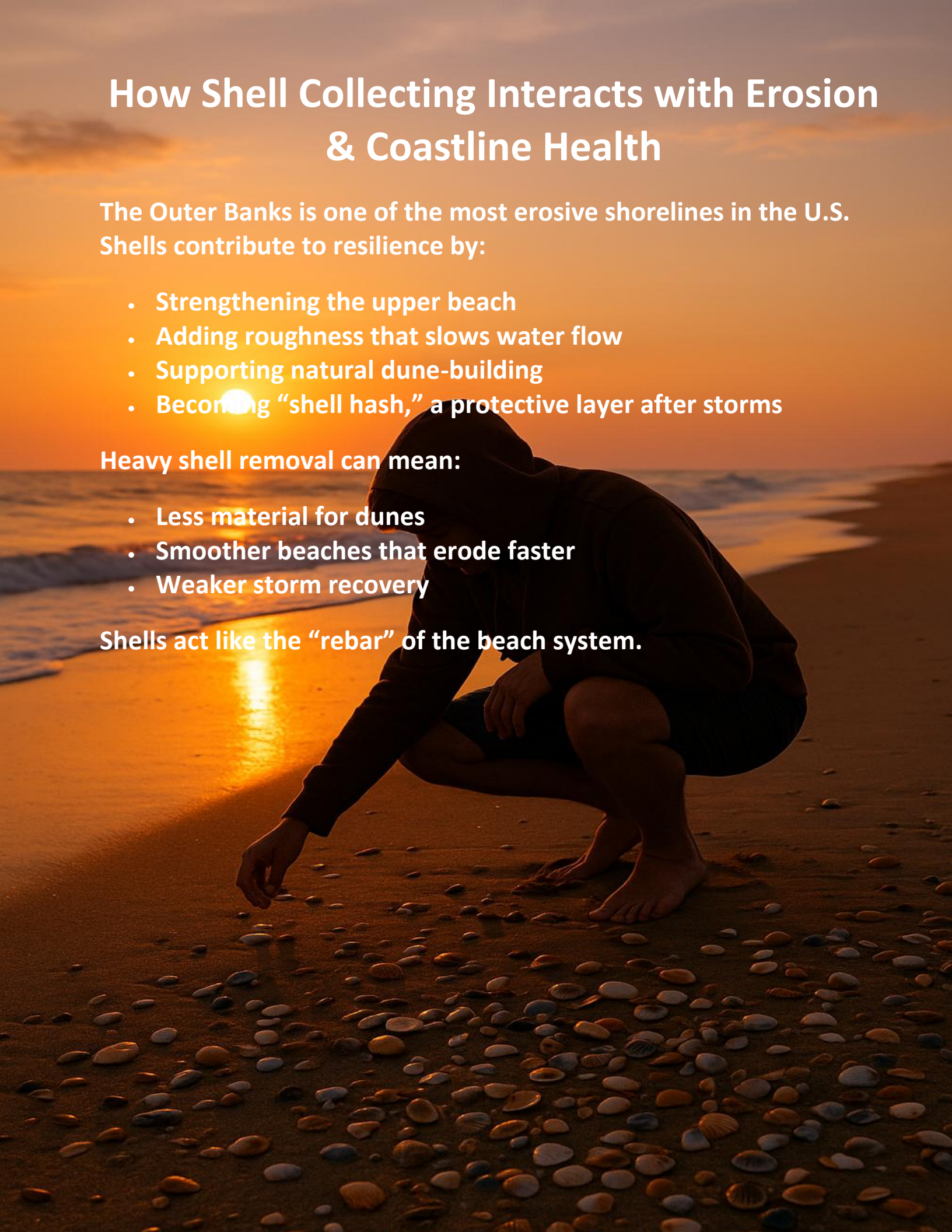
The Outer Banks is one of the most erosive shorelines in the U.S. Shells contribute to resilience by:

- Strengthening the upper beach
- Adding roughness that slows water flow
- Supporting natural dune-building
- Becoming “shell hash,” a protective layer after storms

Heavy shell removal can mean:

- Less material for dunes
- Smoother beaches that erode faster
- Weaker storm recovery

Shells act like the “rebar” of the beach system.



Fun of Shell Collecting

Shell collecting is a meaningful, memory-building activity. Conservationists do *not* want to end it.

The goal is balance, not prohibition.

Many coastal education programs now encourage:

- Mindful collecting (choose meaningful shells, not quantity)
- Photography over collecting for rare finds
- Shadow boxes using broken shells
- Keeping a small journal of shells found instead of taking them all

People can still enjoy the tradition while helping protect the coastline.



Outer Banks-Specific Rules & Conservation Zones

Allowed

- Cape Hatteras National Seashore: small non-living shells are fine
- State beaches: same rule

Discouraged or Restricted

- Pea Island National Wildlife Refuge
- Bird nesting zones (March–August)
- Dune vegetation areas
- Turtle nesting zones (during marked periods)

You won't get in trouble for picking up an empty scallop, but conservation ethics matter.

So Is Shell Collecting Against Coastal Conservation?

Not inherently.

Shell collecting becomes harmful *only when it's done excessively, commercially, or without awareness of the ecological role of shells.*

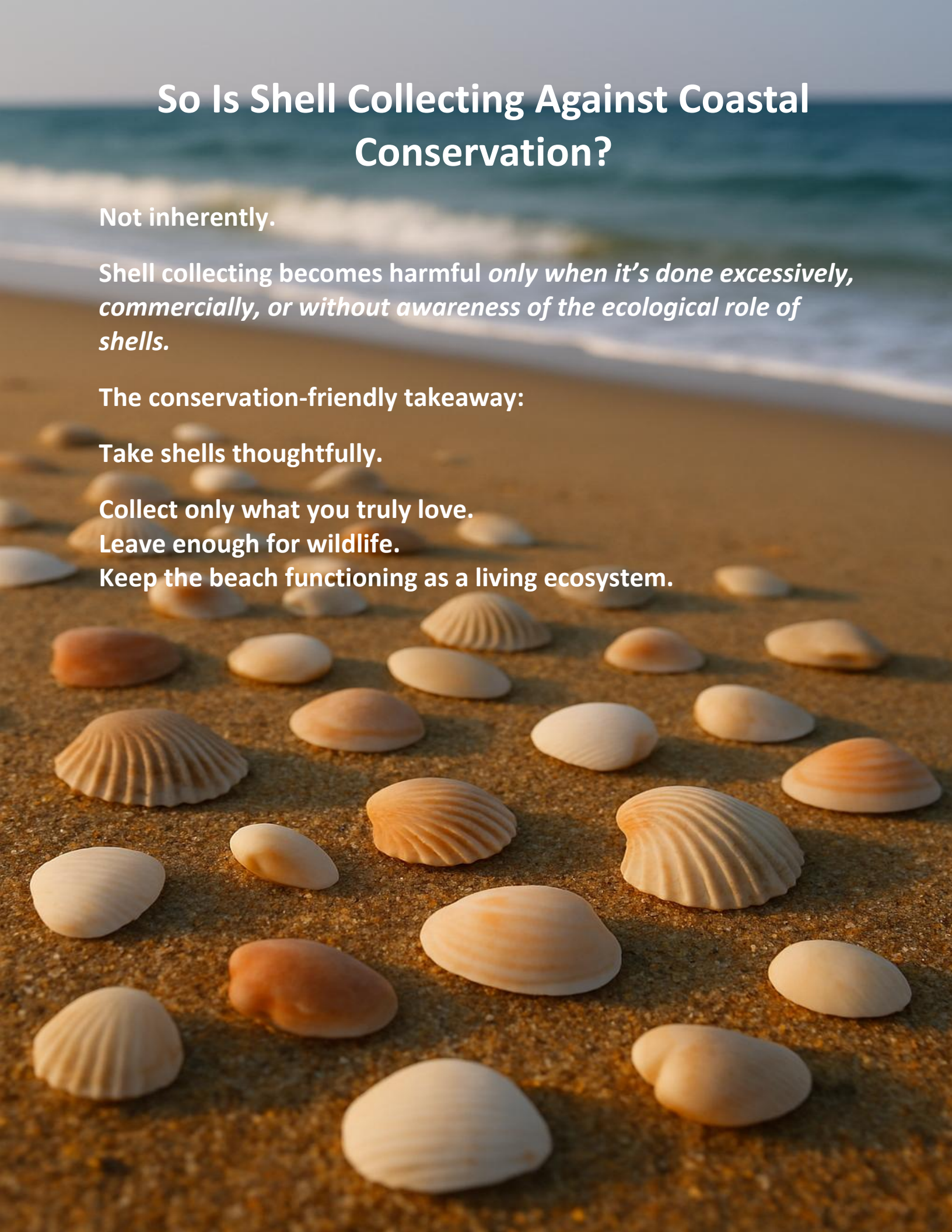
The conservation-friendly takeaway:

Take shells thoughtfully.

Collect only what you truly love.

Leave enough for wildlife.

Keep the beach functioning as a living ecosystem.



References

Bertness, M. D. (2020). *Marine biodiversity and coastal ecosystem function*. Princeton University Press.

Brown, K. M., Alexander, J. E., & Thorp, J. H. (2019). Mollusks as ecosystem engineers: The role of shells in shoreline stabilization. *Estuarine, Coastal and Shelf Science*, 228, 106353. <https://doi.org/10.1016/j.ecss.2019.106353>

Cooper, J. A. G., & Pilkey, O. H. (2012). *Pitfalls of shoreline stabilization: Selected case studies*. Springer.

Defeo, O., McLachlan, A., Schoeman, D. S., Schlacher, T. A., Dugan, J., Jones, A., Lastra, M., & Scapini, F. (2009). Threats to sandy beach ecosystems: A review. *Estuarine, Coastal and Shelf Science*, 81(1), 1–12. <https://doi.org/10.1016/j.ecss.2008.09.022>

Grayson, J., Chapman, M. G., Underwood, A. J., & Lindenmayer, D. (2018). The ecological importance of shell accumulations on sandy beaches. *Marine Ecology Progress Series*, 589, 1–14.

National Park Service. (2023). *Beachcombing and responsible shell collecting guidelines*. U.S. Department of the Interior.

Noriega, R., Schlacher, T. A., & Smeuninx, B. (2012). Reductions in shell abundance on urbanized beaches and consequences for hermit crab populations. *Marine Ecology Progress Series*, 432, 123–132.

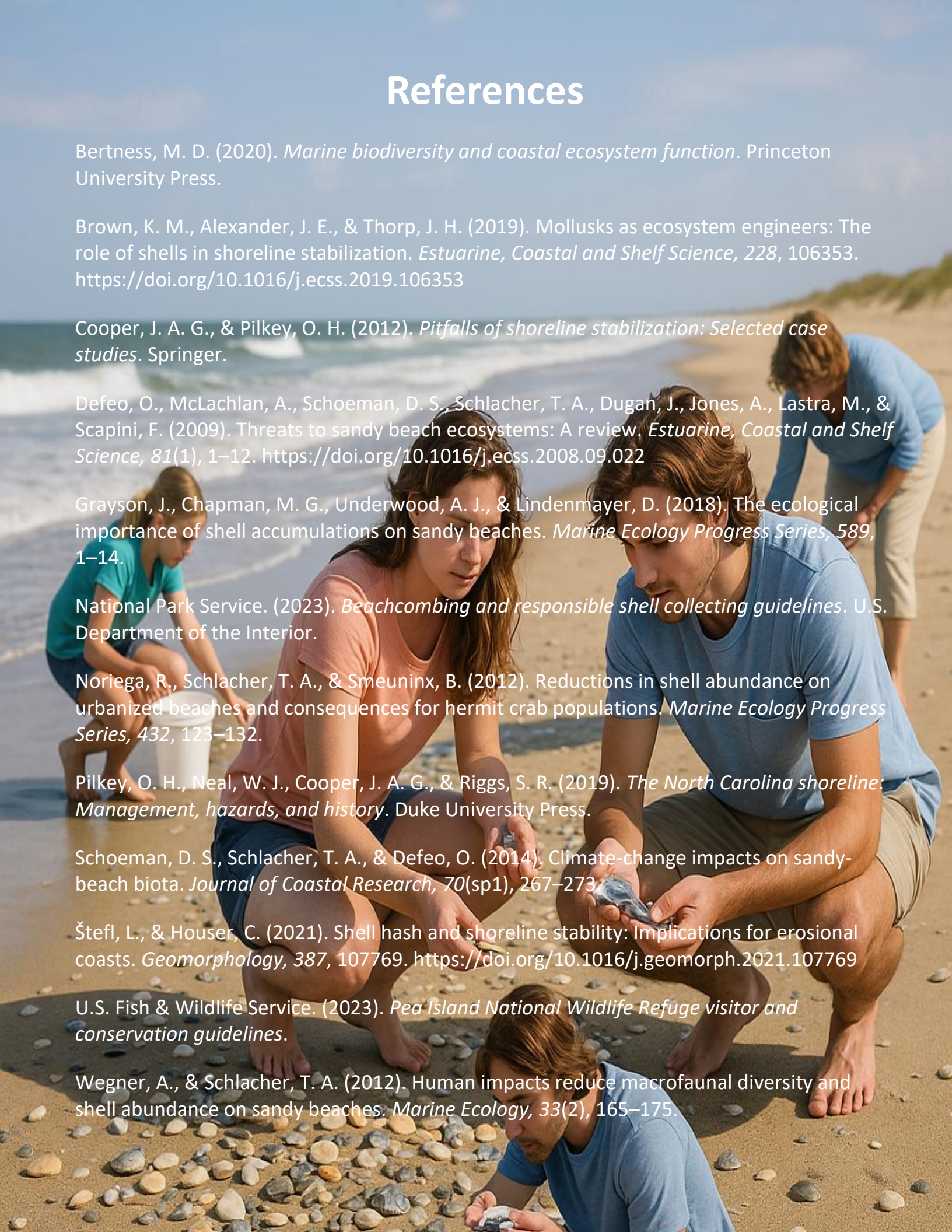
Pilkey, O. H., Neal, W. J., Cooper, J. A. G., & Riggs, S. R. (2019). *The North Carolina shoreline: Management, hazards, and history*. Duke University Press.

Schoeman, D. S., Schlacher, T. A., & Defeo, O. (2014). Climate-change impacts on sandy-beach biota. *Journal of Coastal Research*, 70(sp1), 267–273.

Štefl, L., & Houser, C. (2021). Shell hash and shoreline stability: Implications for erosional coasts. *Geomorphology*, 387, 107769. <https://doi.org/10.1016/j.geomorph.2021.107769>

U.S. Fish & Wildlife Service. (2023). *Pea Island National Wildlife Refuge visitor and conservation guidelines*.

Wegner, A., & Schlacher, T. A. (2012). Human impacts reduce macrofaunal diversity and shell abundance on sandy beaches. *Marine Ecology*, 33(2), 165–175.



Is Shell Collecting Harmful?: A Scientific Look at Coastal Conservation

Shell collecting is a cherished Outer Banks tradition, but shells are more than beach treasures—they play an important role in coastal ecosystems. Even empty shells provide habitat for small marine animals, help stabilize beaches and dunes, contribute calcium to the sand, and create feeding and nesting areas for shorebirds. Some "empty" shells may also contain microscopic organisms or juvenile marine life. The book encourages responsible shell collecting by taking only a few non-living shells, leaving rare or large shells behind, avoiding wildlife nesting areas and dunes, and never collecting shells occupied by living animals. Conservation is about balance—not banning shell collecting, but ensuring enough shells remain to support healthy beaches and wildlife for future generations.

About the Publisher

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