National Park Service
U.S. Department of the Interior

Indiana Dunes National Lakeshore

Structure and Function of Coastal Shoreline Fish Assemblages of Lake Michigan at the Indiana Dunes National Lakeshore

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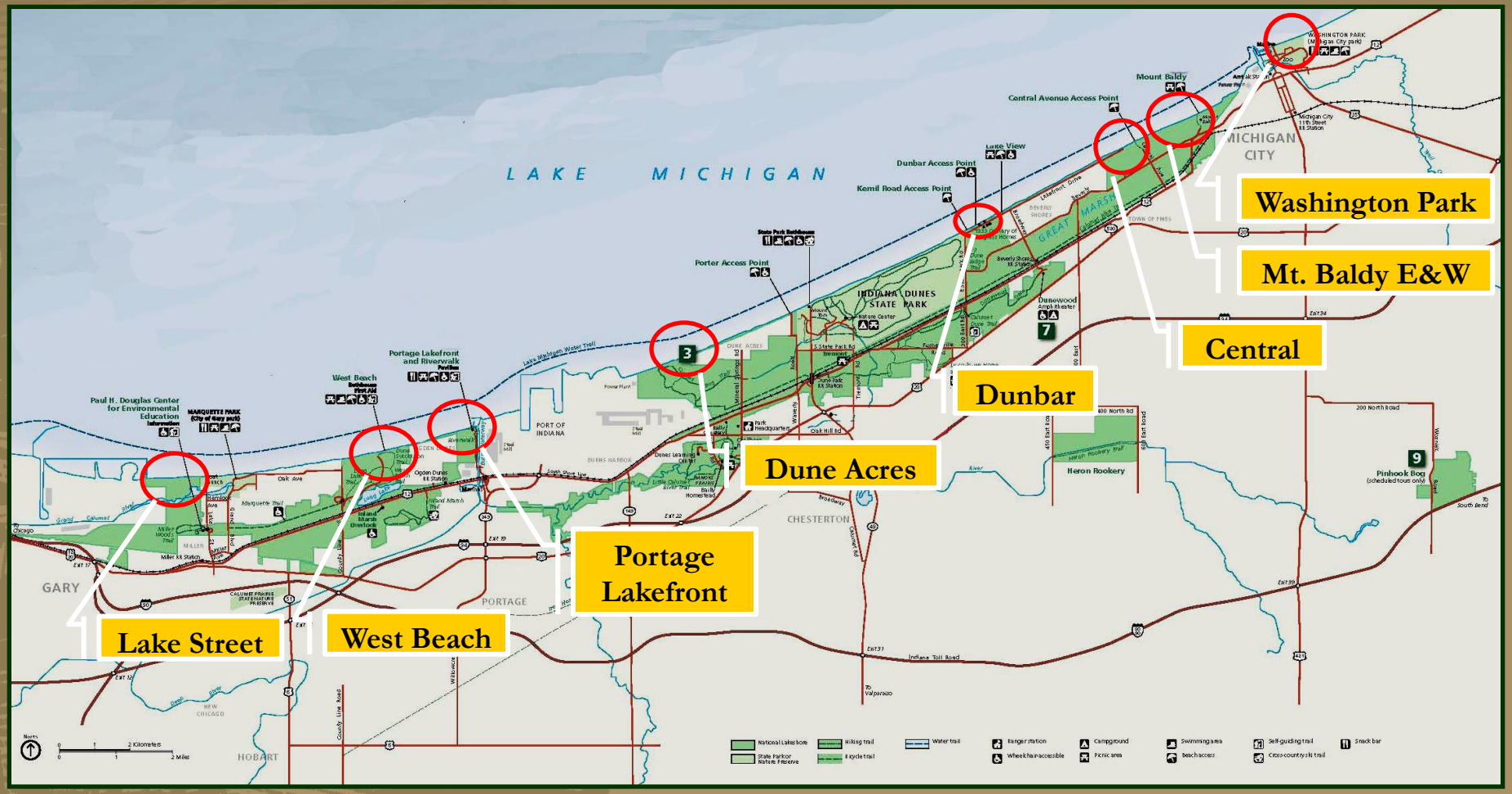
Introduction

- Estimates suggest 139 nonindigenous species occur in the Great Lakes basin, including 25 fish species (Mills et al. 1993, Edsall et al. 1995).

- Primary objective was to assess shoreline fish assemblages as an unmonitored and commonly overlooked resource.

- Intent to document current shoreline condition at the national lakeshore for future restoration efforts.

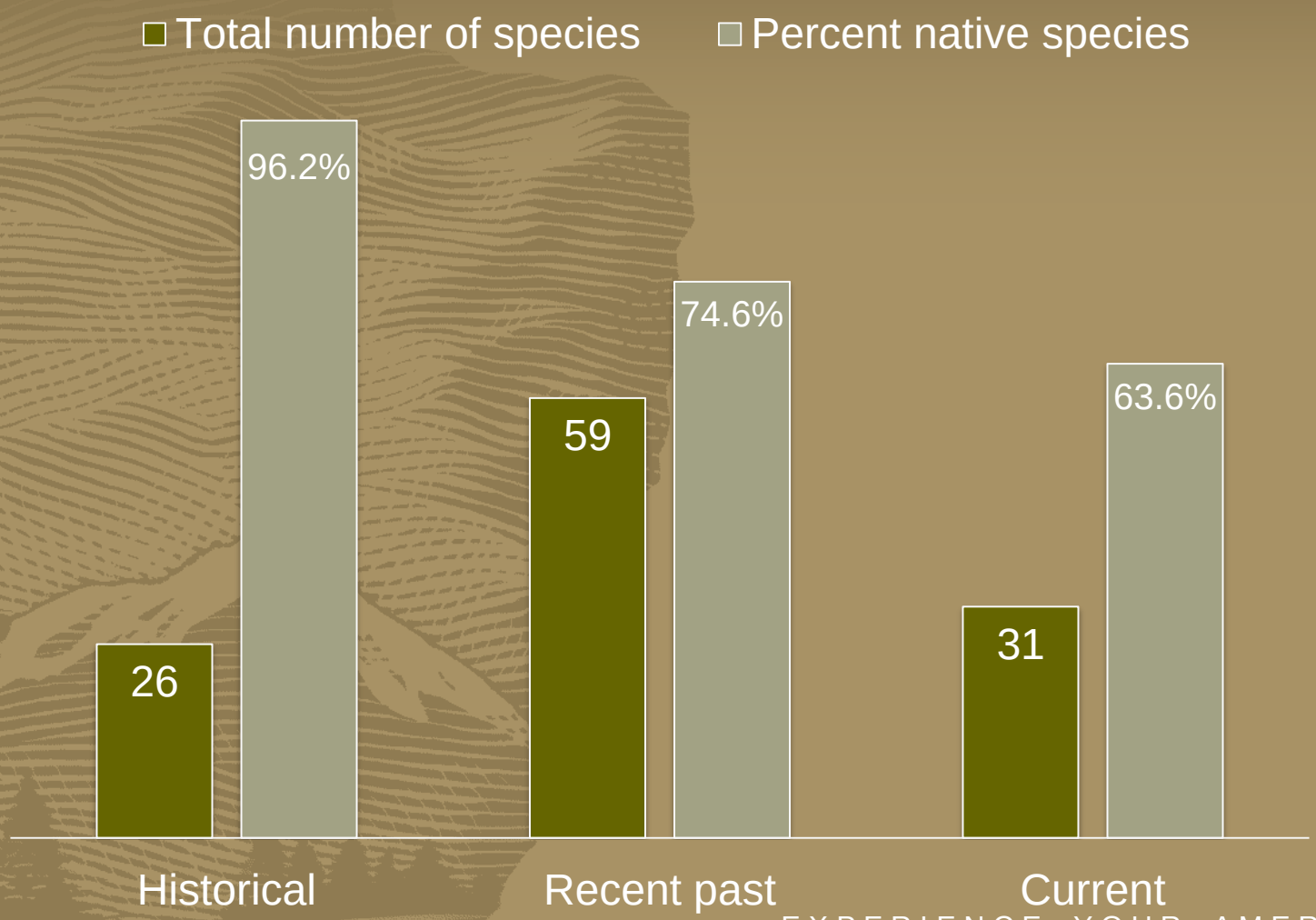
Study Area


LAKE MICHIGAN
Washington Park
Mt. Baldy E&W
Central
Dunbar
Dune Acres
Portage Lakefront
West Beach
Lake Street
Mount Baldy
Central Avenue Access Point
Dunbar Access Point
Kemil Road Access Point
Porter Access Point
MICHIGAN CITY
INDIANA DUNES STATE PARK
CHESTERTON
PORTAGE
GARY
HOBART
Heron Rookery
Pinhook Bog

Collections

- **Historical (Meek & Hildebrand, 1910)** – Beach seining with unknown seine length and mesh sizes.
  - 26 species representing 15 families
  - 96.2% native species
- **Recent past (Simon, 1995-2005)** – Beach seining, visual transect surveys (SCUBA), and boat mounted electrofishing
  - 59 species representing 17 families
  - 74.6% native species
- **Current (2010-2011**) – Beach seining with 50ft bag seine and 6.125mm mesh.
  - 22,924 individuals representing 31 species from 14 families
  - 63.6% native species

Total Species vs. Native Species Composition



Dominant Species

Yellow perch (*Perca flavescens*)

Brook silverside (*Labidesthes sicculus*)

Spottail shiner (*Notropis hudsonius*)

Common Species

Mimic shiner (*Notropis volucellus*)

Round goby (*Apollonia melanostoma*)

Sand shiner (*Notropis hudsonius*)

Alewife (*Alosa pseudoharengus*)

Infrequent Species

Longnose gar (*Lepisosteus osseus*)

Quillback *(Carpiodes cyprinus)*

Banded kilifish (*Fundulus diaphanus*)

Temporal Variation at the Family level

	Families Absent Since 1910	New Records Since 1910
1	Acipenseridae	Lepisosteidae
2	Amiidae	Clupeidae*
3	Esocidae	Ictaluridae
4	Anguillidae	Atherinidae
5	Gadidae	Moronidae*
6	Percopsidae	Gobiidae*
7	Cottidae	

Native Decline and Replacement

Muskellunge (*Esox masquinongy*)

Bowfin (*Amia calva*)

Burbot (*Lota lota*)

Native Decline and Replacement

Longnose dace (*Rhinichthys cataractae*)

Trout-perch (*Percopsis omiscomaycus*)

Silver lamprey (*Ichthyomyzon unicuspis*)

Sea lamprey (*Petromyzon marinus*)

Native Decline and Replacement

Round goby (*Apollonia melanostoma*)

Johnny darter (*Etheostoma nigrum*)

Mottled sculpin (*Cottus bairdi*)

Conclusion

- The number of fish species on the shoreline has increased as a result of the establishment of nonindigenous and exotic species.
- This has contributed to a 32.6% decline in native species populations since historical conditions.
- Increased monitoring, assessment of coastal conditions and the development of coastal biological indicators are needed for the evaluation and modeling of native assemblage restoration.

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