The Glacial Relict Fishes of South Dakota's Sandhills

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Many people have heard of the Nebraska Sandhills, but few know about the Sandhills of South Dakota. South Dakota's Sandhills is a unique landscape filled with rolling seas of sand dunes covered by an array of prairie grasses. This small slice of paradise is located on the southwestern edge of South Dakota along the Nebraska state line.

This region was strongly shaped by wind during the last glaciation. The streams of this area depend primarily on groundwater to maintain flow, unlike typical prairie streams which depend primarily on surface runoff. The unique habitat and history of the Sandhills have resulted in a unique fish assemblage dominated by "glacial relict" minnows. These relicts were stranded in the Sandhills during the last glaciation and today are rare in South Dakota and listed in South Dakota's Wildlife Action Plan as species of greatest conservation need (SGCN). Specifically, the streams of the Sandhills provide habitat for Finescale Dace, Northern Redbelly Dace, Northern Pearl Dace, and Blacknose Shiner, all SGCN (see page 17).

Finescale Dace *Chrosomus neogaeus*

Description A small, dusky colored fish with a silvery-white belly. A dusky stripe extends from the snout along the sides to the tail, usually ending with a distinct spot. An iridescent, silvery band is found above the dusky colored stripe on the sides. Adult breeding males have a reddish-orange belly and yellow fins.

Distribution & Status South Dakota is on the southern periphery of this species' range and occurs in southern South Dakota in the Sandhills and Black Hills regions. Globally this species has an extensive range, with a low risk of extinction or decline, but in South Dakota it is listed as a state endangered species.

Habitat Prefers small, quiet headwater streams and ponds with dense aquatic vegetation. Sometimes found in association with Northern Redbelly Dace, with which they may hybridize.

Northern Redbelly Dace *Chrosomus eos*

Description A small minnow with an olive-brown back and two distinct bands on its sides. Below the belly is silvery-white except in breeding males, which display red bellies and yellow fins.

Distribution & Status South Dakota is on the southern periphery of this species' range and occurs in southern South Dakota in the Sandhills region and within the Big Sioux River drainage. Globally this species has an extensive range, with a low risk of extinction or decline, however in South Dakota it is listed as a state threatened species.

Habitat Prefers small, quiet springfed areas of streams, bogs, and beaver ponds with dense aquatic vegetation.

Northern Pearl Dace *Margariscus nachtriebi*

Description A dark or dusky colored minnow with a silvery-white belly, dark lateral band, and dark spot near the tail. Adult breeding males have reddish-orange sides below the lateral band.

Distribution & Status South Dakota is on the southern periphery of this species' range and occurs in southern South Dakota in the Sandhills region. Globally this species has an extensive range, with a low risk of extinction or decline, but in South Dakota it is listed as a state-threatened species.

Habitat Prefers small, clear streams, lakes, bogs, and ponds.

Blacknose Shiner *Notropis heterolepis*

Description A slender, silvery metallic minnow with large eyes. Along the sides, this minnow displays a dusky stripe from the tip of the snout, passing through the eye, and ending at the tail. Dark outlines border the scales above the lateral stripe; however, the belly is silvery-white in color.

Distribution & Status South Dakota is on the western periphery of this species' range and occurs in southern South Dakota in the Sandhills region and in limited sections of the James River drainage. Globally this species has an extensive range, with a fairly low risk of extinction with a few isolated declines in population abundance, but in South Dakota it is listed as a state-endangered species.

Habitat Prefers small, moderately clear, headwater streams, and quiet pools having dense aquatic vegetation.

South Dakota Research

South Dakota Game, Fish and Parks is currently working with South Dakota State University and several partners in Nebraska to paint a better picture of the status and habitat requirements of these glacial relicts. Part One has recently been completed with the help of South Dakota State University master's student Eli Felts. A total of 34 sites were surveyed across Bennett, Mellette, Todd, and Tripp counties in the Sandhills region.

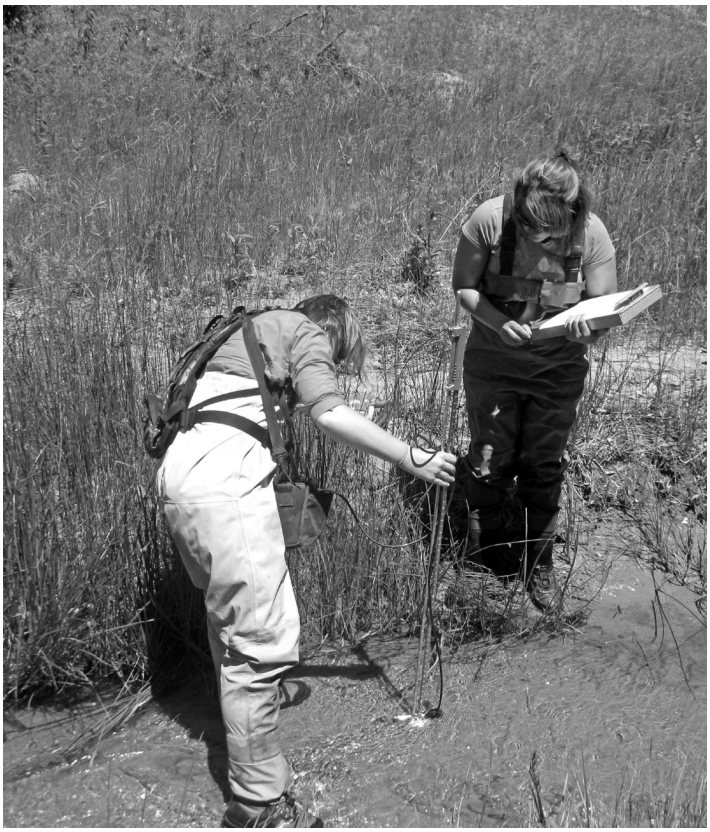
What we've learned is that Northern Pearl Dace were regularly sampled, occurring at more than 30% of the sampled sites. Although normally detected in low abundance (<1 fish/minute), Pearl Dace were occasionally sampled in abundances as high as 25 fish/minute. Northern Redbelly Dace were sampled at three sites, a single Blacknose Shiner was sampled, and no Finescale Dace were sampled over the three sampling seasons for this project.

These glacial relicts appear to be limited by stream type, occupying perennial headwater streams fed by cool groundwater. We have also been able to identify streams within the Sandhills region that are home to high abundances of these species. An interesting and unexpected finding was the importance of beaver ponds. We typically don't think about the interactions between fish and terrestrial wildlife, but, beaver ponds provided important, quiet pool environments for these fish species, which ultimately led to higher abundances and reproductive success.

Part Two of this research will continue with collaboration between South Dakota Game, Fish and Parks, South Dakota State University and Nebraska partners. The plan is to resample the streams that had higher densities of these glacial relicts and complete a more extensive sampling effort from headwater to confluence within the Keya Paha River drainage. This will enable us to better understand how these species assemblages change in relation to the habitat, including potential effects of culverts, other migration barriers, and land-use practices on fish. With a better understanding of the key habitat requirements of these species and knowledge of their limiting factors, we hope to better manage these unique "relicts" in the future.

Why should we care?

Why should these minnows concern us? After all, they are "just minnows" and most of us have never seen one before. It is the message that these small glacial relicts and other "indicator"species, relay that's important. Eventually, all organisms (including people) are affected when a system becomes degraded. Indicator species just respond to those changes sooner. These "relicts" can tell us a story of the watershed's past health and warn us of future problems.



The first phase of the research identified the importance of beaver ponds for glacial relict fishes. Photos by Eli Felts

South Dakota's Glacial Relicts

Finescale Dace

Konrad Schmidt

Mississippi River tributary (Dakota County, MN)

East Holden Pond (Morrison County, MN)

Blacknose Shiner

Northern Pearl Dace

Konrad Schmidt

Rose Creek tributary (Mower County, MN)

Northern Redbelly Dace

Konrad Schmidt

Konrad Schmidt

Sandhill River (Polk County, MN)