University of Nebraska - Lincoln
DigitalCommons@University of Nebraska - Lincoln

Nebraska Game and Parks Commission -- White Papers, Conference Presentations, & Manuscripts

Nebraska Game and Parks Commission

1-1-1964

Recent Limnological Studies of the Alkaline Lakes in Nebraska and North Dakota

D. B. McCarraher
Game, Forestation and Parks Commission, Bassett, Nebraska

Follow this and additional works at: http://digitalcommons.unl.edu/nebgamewhitepap

Part of the Environmental Sciences Commons

McCarraher, D. B., "Recent Limnological Studies of the Alkaline Lakes in Nebraska and North Dakota" (1964). *Nebraska Game and Parks Commission -- White Papers, Conference Presentations, & Manuscripts.* Paper 5.
http://digitalcommons.unl.edu/nebgamewhitepap/5

This Article is brought to you for free and open access by the Nebraska Game and Parks Commission at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Nebraska Game and Parks Commission -- White Papers, Conference Presentations, & Manuscripts by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

A B S T R A C T

Recent Limnological Studies of the Alkaline Lakes in Nebraska and North Dakota

D. B. Mc Carraher
Game, Forestation and Parks Commission
Bassett, Nebraska

Environmental relationships and biological indices have been recorded for 1,200 sandhills lakes in Nebraska since 1954. Three lakes in central and southern North Dakota were investigated during the years 1963 to 1964. Most of the Nebraska lakes were alkaline eutrophic of the sodium bicarbonate and sodium + potassium carbonate types. The North Dakota lakes range from sodium bicarbonate to sodium sulfate types. These lakes may be classified as saline eutrohpic. The ionic composition differs from that of the marine and inland sodium chloride type of water. The invertebrate fauna of permanently alkaline environments are discussed from the point of view that the faunal associations present are related to the total alkalinity and pH conditions. The biota of high alkaline lakes reflected specialized 'alkalinbionts' species not present in light alkaline sites. With increasing alkalinity the number of species decreased, but the number of individuals of the remaining species increased. Phyllopod shrimp of the Genera Branchinecta and Artemia dominate the macrofauna of the high alkaline lakes (1.2-6.5% solids) in Nebraska. Twenty species of fish are found. About 33 percent of Nebraska's sandhill lakes are non-supporting for fish life because of excessive alkalinity content. In North Dakota, about 40 percent of the saline lakes are non-inhabitable for fish life because of high concentrations of sodium sulfate ions. Retrospective studies are currently underway with euryhaline fish; i.e., Archoplites interruptus, Roccus americanus, and estuarine shrimp, Crangon septumspinosa, Palaemonetes vulgaris, as potential inhabitants of mineral waters in both states. The thousands of alkaline and saline environments present throughout the Northern Great Plains region offers vast opportunities for prospective experimentation in hydrobiology.

15th Annual Meeting of American Institute of Biological Sciences, Boulder, Colo. 1964.