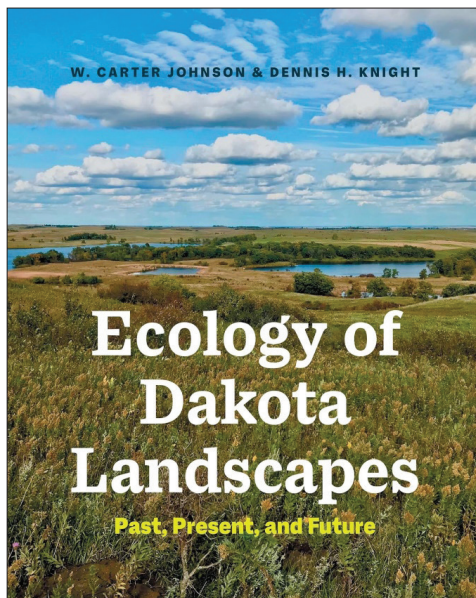


Ecology of Dakota Landscapes: Past, Present, and Future, by W. Carter Johnson and Dennis H. Knight. 2022. Yale University Press, New Haven, Connecticut. 336 pages. \$45.00 (paperback and eBook). ISBN: 978-0-30025-381-8 (paperback), 978-0-30026-529-3 (eBook).

Ecology of Dakota Landscapes merges observation and scientific studies to describe the origins and development of the landscape of North and South Dakota, the effect of European settlement, the introduction of agriculture to the area, predictions for the future in the face of a changing climate, and a scientific framework for conservation and sustainability. Johnson and Knight bring to this book a personal fascination with this landscape. Their decades of experience and knowledge of the ecosystems of the Dakotas is exhibited in the well written and copiously illustrated 13 chapters. This book blends observation, geology, biology, ecology, history, and the transformation of this landscape by European settlement, and identifies the challenges that will be faced with climate change. Johnson and Knight have a writing style that facilitates the presentation of these important concepts and ideas to a general audience.

Chapter 1 provides a brief overview of the Dakotas and introduces several themes which are revisited in each of the subsequent chapters. One such topic is the transformation of the natural pre-European landscape to one dominated by agriculture and how this transformation modified the native ecosystems of the Dakotas. Understanding the consequence of this transformation requires the introduction of two related topics: knowledge of ecosystem science and the services that ecosystems provide (termed ecosystem services). Chapter 2 covers the development of the landforms of these two States, reaching back millions of years, and briefly describes the subsequent geological processes that influenced the physical development of the region. The glacial history of the region further explains the characteristic landscape now seen in the eastern Dakotas. Finally, the chapter covers the human history of this landscape from the early Indigenous peoples to early European pioneers. The last several paragraphs of Chapter 2 cover the influx of farmers in the late 19th century and the subsequent impact of agricultural practices on native ecosystems. Chapter 3 covers the climate of the region, which is reflected in the northwest to southeast gradient in annual precipitation and the north to south gradient in maximum temperature. These climatic gradients influenced both the distribution of native plants and the subsequent agricultural development of the region. The potential changes in the climate of this region are summarized here and form the basis for subsequent chapters which discuss how institutions and people may respond to these changes.

Chapter 4 describes the ecology of grassland systems, which are often referred to as prairies. Chapter 5 then addresses the effect of agriculture and agroecology in these systems, and Chapter 6 covers the introduction of trees on the farm in the form of shelterbelts. These



chapters discuss in more depth the influence of European settlement in modifying the extensive grassland systems discussed in Chapter 4. North and South Dakota are often imagined by the public as a landscape of rolling grassland but there is great diversity in these two States. The subsequent chapters (Chapters 7–13) describe areas of native trees, riparian forests, and landscapes of lakes and wetlands, and buttes and eroded escarpments (“badlands”) found in the western Dakotas. The ecology of these other natural systems and the influence of climate change on these systems and the ecosystem services that they deliver are well covered. The book concludes with a discussion of “Working toward Sustainability” in Chapter 13, which describes the importance of developing sound management practices for the Dakota landscapes and how landowners, conservation biologists, and policy makers can work together to develop an ecosystem management approach to the land that also anticipates future changes.

Ecology of Dakota Landscapes is well written and philosophically impactful, suggesting how society could anticipate change and manage landscapes. The authors infer that implementing mitigation and adaptation strategies to address changes will be complex.

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