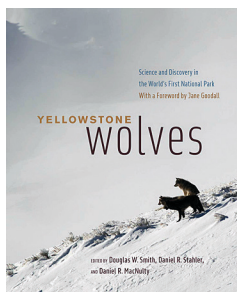


Yellowstone Wolves: Science and Discovery in the World's First National Park

Edited by Douglas W. Smith, Daniel R. Stahler, and Daniel R. MacNulty. 2020. University of Chicago Press. 358 pages, 35.00 USD, Cloth.

Yellowstone Wolves is a comprehensive, important, and authoritative text that summarizes the major findings of the first 25 years of wolf recovery in one of the world's first national parks. Given that the vast majority of people (79 to be exact: pp. 321–326) involved with the restoration have contributed to this massive six-year undertaking (p. 285), it will definitely be the ultimate reference on wolves in Yellowstone and beyond for years to come. While L.D. Mech and L. Boitani's *Wolves: Behavior, Ecology, and Conservation* (2003, University of Chicago Press) might be considered the definitive work on wolves to date, *Yellowstone Wolves* is the most detailed text published on the species in a specific location. The book is more academic than most previous publications on Yellowstone wolves so it is perfect for biologists, die-hard fans, and travellers to Yellowstone; as a text in college wildlife biology courses; and for the layperson with a keen interest in Yellowstone or wolves. It is a bit technical, however, so might not be suitable or of interest to the casual tourist who visits the park. For them, I might suggest easier reads, such as Rick McIntyre's books on Yellowstone wolves (Way 2019, 2020a).

While not an informal, page-turning read like others that have come from the park, *Yellowstone Wolves* tells the complete story of the species' recovery, starting with 14 wolves reintroduced from Canada in 1995



and then with 17 more in 1996 (pp. 23–24). Their subsequent ecological impact over the last two and a half decades is presented in an accessible, scientific way through anecdotes, many pictures, and other stories (including guest essays). It is illustrated with loads of colour images and impressive graphs and tables (many of which I have seen in previous publications), making it a good book for one's coffee table. Plus, a 68-minute accompanying online video, produced by cinematographer extraordinaire Bob Landis, shares original wolf footage and interviews with some of the main players of this collaborative effort. I have read dozens of peer-reviewed scientific articles, books, and popular (magazine and online) articles and have watched numerous documentaries on Yellowstone's wildlife. This book is a summary of all those sources, from the wolf's perspective. The authors' goal was clearly to put the results of all of the impressive research into an organized volume. For that, they did a fantastic job! Furthermore, the price is very reasonable, especially for a large, heavy (4–5 pounds [2 kg]), double-columned book printed entirely on glossy paper.

The book is divided into six major sections: the history and reintroduction process; behavioural and population ecology; genetics and disease; wolf–prey relationships; ecosystem effects and species interactions; and conservation, management, and the human experience. We gain knowledge of individual wolves, family dynamics, population dynamics, territoriality, effects of disease, genetics and the rise of the black wolf (Chapter 8), wolf–Elk relationships, scavenging on bison carcasses (pp. 166, 174), management

and various stakeholders involved, interspecies interactions, and the ‘trophic cascades’ that wolves have (purportedly) caused. My favourite part was Chapter 18, *The Wolf Watchers*, because I am part of that loose collection of folks (e.g., Way 2020b) and believe that this eclectic group has been critical for helping to give widespread attention to individual wild wolves which helps garner support to better protect them (p. 257). This is important because wolves are estimated to generate \$65.5 million USD a year in the Yellowstone region (pp. 260–261).

Chief among the many themes in this wide-ranging book is the importance of radio-collaring wolves (pp. 32, 139, 269). This was apparent throughout the text, with just about every research finding predicated on using marked animals—including the wolves’ prey (deer, Elk, and bison) and competitors (bears, Cougars, Coyotes)—to track and determine home range and territory size, habitat selection, movement and activity patterns, food habits, mortality causes, and sociality. Yellowstone is unparalleled because biologists and tourists alike most often observe wolves easily from the park’s roadways, giving the animals more space in the backcountry to behave naturally (p. 248). This spectacular visibility has made Yellowstone the best place in the world to observe wolves, a central tenet of the book (e.g., pp. 26, 261). Wolves in Yellowstone are also one of the least persecuted populations in North America, providing a benchmark to compare other populations (p. 267). The park is also an ideal natural ‘laboratory’ for conducting valuable long-term studies that provide researchers a deep knowledge of the system and their study subjects (p. 143).

Yellowstone Wolves demonstrates in detail that while Elk are the main prey and food source of wolves, scavenged bison has become an increasingly large percentage of their diet as bison numbers have increased and Elk have decreased in the park (Part 4: *Wolf-Prey Relationships*). Wolf predation attempts usually fail, even for Elk, and bison are about three times more difficult to kill (p. 149). Wolves are a generalist species, a jack of all trades, so are not particularly adept at killing large prey (pp. 32, 187) and are usually only able to kill the young, old, and weak (pp. 162–163). However, with a full suite of carnivores presently on the landscape, the ecosystem has been at least partially restored with improved willow and aspen regeneration in many parts of the park, although it is difficult to distinguish between behavioural (landscape of fear) versus demographic (i.e., reduced numbers) changes in Elk (Chapter 15).

We learn in *Yellowstone Wolves* that males are the better hunters and defenders of their family’s territory while females are the social glue of the pack and are

most involved in leading pup-rearing activities (Part 2: *Behavioral and Population Ecology*). With an average pack size of 10 (pp. 46, 59), wolf family structure in Yellowstone is more flexible and diverse than previously described elsewhere, with packs often starting from groups, not pairs (p. 43). In fact, this ‘group dispersal’ was often mentioned in the text and is unique to wolves in Yellowstone who live in a saturated population that requires strength in numbers to claim an area (pp. 44, 60, 75, 89). I also found the discussion of black wolves, about 50% of the colour morphs in the park, fascinating because they likely arose in northwestern North America (i.e., Yukon region) via introgression with Domestic Dogs (pp. 112–113). Black wolves have better immunity than grey-coloured wolves and are thus more adept at surviving disease epidemics, while greys are more aggressive and have about 25% better litter survival than their melanistic counterparts (pp. 116, 119). To balance these life history factors, a disproportionate number (64%) of pairs are mixed colours; this disassortative mating is rare in nature (p. 115; also see online video).

The book’s 19 chapters serve as standalone manuscripts written by various combinations of the 79 different contributors. A robust 31-page, double-columned Literature Cited section accompanies the text. *Yellowstone Wolves* need not be read completely and in order as it can be used as much as a reference as anything else. However, I did read the entire book from cover to cover and found that it had many repetitive sections owing to this format. While it certainly stressed the importance of many key concepts described above, it also became confusing to remember where certain passages appeared even though I created two pages of detailed notes. For instance, habituated wolves were mentioned often (e.g., pp. 247, 252, 269), as were the open landscape of the park permitting year-round observation (e.g., Chapter 18 and just about every other chapter), wolf reintroduction coinciding with the natural recovery of Grizzly Bears and Cougars (especially Chapters 10–16), and the natural regulation philosophy occurring in national parks (literally throughout the book, but especially in the five chapters of Part 4; also see p. 267). This similarity and repetitiveness in text, not surprisingly, was most pronounced in related chapters that were within the same section (e.g., within Part 4) because their data collection methods were similar. However, each chapter also presented important and different research results; for instance, wolf–Elk populations have appeared to stabilize in the park and the diverse number of predators and prey species, as well as other factors such as human hunting and climate change, make it difficult to predict what may happen in the future (Part 4).

There is no doubt that this is one of the most significant and impressive volumes ever written on wolves and I wholeheartedly recommend it. The main value of this book is to serve as a baseline to which other manuscripts and wolf populations will be compared. For example, I envision future studies citing this book when comparing their research results to average packs sizes where wolves are not readily killed by people, prey selection in a natural versus human-influenced system, wolf behaviour and interspecific relationships in diverse ecosystems, or the ability to study wolf behaviour directly for an extended length of time, which is unparalleled in Yellowstone (Chapters 17 and 18). To that end, *Yellowstone Wolves* has set the standard for a tome on a wildlife species in a specific area. Kudos to all of the authors involved in this endeavour!

Literature Cited

- Way, J.** 2019. [Book Review] The Rise of Wolf 8: Witnessing the Triumph of Yellowstone's Underdog, by Rick McIntyre. *Canadian Field-Naturalist* 133: 180–181. <https://doi.org/10.22621/cfn.v133i2.2407>
- Way, J.** 2020a. [Book Review] The Reign of Wolf 21: the Saga of Yellowstone's Legendary Druid Pack, by Rick McIntyre. *Canadian Field-Naturalist* 134: 392–393. <https://doi.org/10.22621/cfn.v134i4.2739>
- Way, J.G.** 2020b. E-book (Revised, 2021). *The Trip of a Lifetime: a Pictorial Diary of My Journey Out West*. Eastern Coyote/Coywolf Research, Barnstable, MA. Accessed 27 July 2021. <http://www.easterncoyoteresearch.com/TheTripOfALifetime/>.

JONATHAN (JON) WAY
Eastern Coyote/Coywolf Research,
Osterville, MA, USA