restricted habitats. Populations were censused and observed throughout the year. Interspecific competition and predation probably either were not significant or (for the grouse) could be only roughly estimated. Social behavior could be observed or at least inferred. Finally, important resources could be roughly quantified. Thus each of these three studies satisfied most of the requirements for a simplified natural system suggested in our introduction. Despite the simplicity of these systems, a large number of processes were shown to be clearly important.

It is reasonable to conclude that in order to make progress in the study of population regulation, researchers must study a wide range of factors affecting their populations. Given the state of our knowledge, studies on relatively simple systems are much more likely to yield results that are valid, and more easily interpreted. Much about the dynamics of Dipper populations remains to be clarified, but because of their simple habitat and other characteristics mentioned earlier, this species is unusually well suited to studies of population regulation. Further work on this fascinating group of birds should be well rewarded.

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## LITERATURE CITED

ALDER, J. 1963. Behaviour of Dippers at the nest during a flood. Brit. Birds 56:73-76.

ANDERSSON, J. S., AND S. A. L. WESTER. 1971. Length of wing, bill, and tarsus as a character of sex in the Dipper Cinclus cinclus. Ornis Scand. 2:75-79.

- ANDREWARTHA, H. G., AND L. C. BIRCH. 1954. The Distribution and abundance of animals. Univ. of Chicago Press, Chicago.
- BAKUS, G. J. 1957. The life history of the Dipper on Rattlesnake Creek, Missoula County, Montana. M.A. Thesis. Montana St. Univ., Missoula.
- BAKUS, G. J. 1959a. Observations on the life history of the Dipper in Montana. Auk 76:190-207.
- BAKUS, G. J. 1959b. Territoriality, movements, and population density of the Dipper in Montana. Condor 61:410-425.
- BALÁT, F. 1960. Studie o pelichání skorce vodního, *Cinclus cinclus* (L.). [A study on moulting in the Dipper, *Cinclus cinclus* (L.).] Zool. Listy 9:257–264. [English summ.]
- BALÁT, F. 1962. Rozmístení a presuny skorce vodního na potoce v závislosti na stárí, rocní dobe a prostrédi. [Distribution and movements of the Dippers, *Cinclus cinclus aquaticus* Bechst. on a creek and their changes during a year.] Zool. Listy 11:131–144. [English summ.]
- BALAT, F. 1964. Breeding biology and population dynamics in the Dipper. Zool. Listy 13:305–320.
- BARRY, R. B., AND R. J. CHORLEY. 1970. Atmosphere, weather and climate. Holt, Rinehart and Winston, New York.
- BENT, A. C. 1940. Life histories of North American cuckoos, goatsuckers, hummingbirds and their allies. U.S. Natl. Mus., Bull. 176:111-130.
- BENT, A. C. 1948. Life histories of North American nuthatches, wrens, thrashers, and their allies. U.S. Natl. Mus., Bull. 195:96–113.