At the Missouri site, eagles had access to large numbers of crippled and dead geese, which presumably were the primary source of lead shot. In South Dakota, Steenhof (1976) reported finding waterfowl remains in 285 of 363 egested pellets including 10 (2.7%) with lead shot. Based upon her observations, she concluded eagles obtained most of the waterfowl in upland fields. Likewise, at our Nebraska site, eagles ate waterfowl that had been feeding in upland fields (obtained by kleptoparasitizing other raptors [Jorde and Lingle, in press]). In March 1980, they also scavenged waterfowl that had died of avian cholera (Lingle and Krapu 1986).

Infrequent ingestion of lead shot by Bald Eagles in Nebraska probably stems from a low incidence of lead shot among waterfowl wintering along the Platte and North Platte rivers. The frequency of occurrence of lead shot in wintering waterfowl in Nebraska is not known; however, only about 1% of waterfowl wintering in the Texas High Plains region during the same period had lead shot in their digestive tracts (Wallace et al. 1983). It is probable that field-feeding Mallards obtained in lightly hunted uplands contain fewer lead shot than cripples or segments of the population feeding principally in wetlands where hunting activity and lead shot contamination are likely to be concentrated.

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## LITERATURE CITED

- GRIFFIN, C. R., T. S. BASKETT, AND R. D. SPARROWE. 1982. Ecology of Bald Eagles wintering near a waterfowl concentration. U.S. Fish and Wildl. Serv. Spec. Sci. Rep. Wildl. 247. Washington, D.C.
- JORDE, D. G. AND G. R. LINGLE. Kleptoparasitism by Bald Eagles wintering in southcentral Nebraska. J. Field Ornith. In press.
- KAISER, T. E., W. L. REICHEL, L. N. LOCKE, E. COMARTIE, A. J. KRYNITSKY, T. G. LAMONT, B. M. MULHERN, R. M. PROUTY, C. J. STAFFORT, AND D. M. SWINFORD. 1980. Organochlorine pesticide, PCB, and PBB residues and necropsy data for Bald Eagles from 29 states, 1975–77. Pestici. Monit. J. 13:145–149.
- LINGLE, G. R. AND G. L. KRAPU. 1986. Winter ecology of Bald Eagles in southcentral Nebraska. Prairie Nat. 18:65–78.
- STEENHOF, K. 1976. The ecology of wintering Bald Eagles in southeastern South Dakota. M.S. thesis, Univ. Missouri, Columbia, Missouri.
- WALLACE, B. M., R. J. WARREN, AND R. J. WHYTE. 1983. Lead shot incidence in waterfowl collected from the Texas High Plains. Prairie Nat. 15:157-158.
- GARY R. LINGLE AND GARY L. KRAPU, Northern Prairie Wildlife Research Center, P.O. Box 2096, Jamestown, North Dakota 58402. (Present address of GRL: The Platte River Whooping Crane Trust, 2550 N. Diers Ave., Ste. H, Grand Island, Nebraska 68803.) (Reprint requests to GLK.) Received 4 Nov. 1987, accepted 4 Feb. 1988.

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Fish surface activity and pursuit-plunging by Olivaceous Cormorants.—We observed Olivaceous Cormorants (*Phalacrocorax olivaceus*) pursuit-plunging (Ashmole, Avian Biology, Vol. 1, Academic Press, New York, 1971; "plunge-diving" in Duffy et al., Wilson Bull. 98: 607–608, 1986) many times in and near a protected bay in the vicinity of Puerto Inglés, Península Lacuy (41°48'S, 73°54'W), Isla Grande de Chiloé, Chile, in January 1987. Our

observations were made approximately 20 km NE of Mar Brava, the site of Duffy et al.'s observations. Olivaceous Cormorants roost (and presumably nest) in tall forest edge trees bordering a marshy lagoon in the interior of Península Lacuy and feed, often in very dense flocks of 100 or more, in protected bays and nearshore waters along the marine coast.

While our observations of pursuit-plunging by Olivaceous Cormorants were very similar in detail to those of Duffy et al. (1986), we add that feeding by pursuit-plunging was initiated by surface activity of rapidly moving schools of small fish. On 15 January, Humphrey and López watched a solitary cormorant feeding about 100 m offshore by pursuit-plunging. The bird first scanned the calm water while swimming. When it saw a school of small fish agitating the surface it took off, flying a meter or less above the surface, and then in full flight, folded its wings and plunged at an oblique angle into the water in the middle of the school. It did this about a dozen times, sometimes flying only a few meters and other times up to 20–30 m or more. This bird had a low success rate; in a series of six plunges it caught a fish only in the last of them.

We saw Olivaceous Cormorants pursuit-plunging only in very calm water, and only when we could detect nearby fish surface activity. These observations suggest that pursuit-plunging is triggered by the surface activity of a school of fish and that the target of a pursuit plunge is the area below the surface activity rather than a specific fish. Pursuit-plunging in Olivaceous Cormorants involves active scanning, location of target surface activity, take-off and rapid flight low over the water, followed by a plunge into the water at the surface disturbance. This type of feeding behavior is exhibited by single individuals as well as large, rapidly moving flocks, as is the pursuit-diving (Ashmole 1971) so well-known in cormorants. We have not seen pursuit-plunging during our observations of Olivaceous Cormorants along the Atlantic coast of Patagonia, nor at three other localities we visited in Chile (Huildad, southeastern Chiloé Island; Ensenada Codihue and Calbuco, Llanquihue Province) where the species is abundant.

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