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### Support for Complete Removal of Mule Deer from Catalina Island

The Catalina Island Conservancy proposes to lethally remove introduced mule deer (*Odocoileus hemionus*) from Catalina Island as part of the larger Catalina Island Restoration Project. The deer were introduced as 3 individuals in 1928 — a buck and two does from Modoc County — followed by 19 animals from Los Angeles County in 1930–1932 (Longhurst et al. 1952). I support complete removal of the descendants of these 22 animals. In my position as an Adjunct Professor in the Institute of the Environment and Sustainability at UCLA, I am part of a team that is preparing specific restoration action plans to begin repairing the harm that has been done by the deer and other introduced herbivores over the decades.

Support for removal of the deer is based on several factors. No large mammalian herbivores are native to Catalina Island, meaning that the unique flora has evolved without pressure from such herbivores and is threatened and harmed by their presence. For example, experiments with deer exclosures shows that browsing dramatically reduces the size and vigor of the endemic, federally threatened island rush-rose (*Crocanthemum greenei*) (Dvorak et al. 2016). Researchers also found that seed production of the island rush-rose was greatly reduced when exposed to browsing by mule deer (Dvorak and Catalano 2016). Mule deer browsing furthermore reduces the size of seedlings emerging after fire, influencing vegetation structure (Jacobsen et al. 2018). These results are unsurprising, given that deer browsing in mainland environments is known to influence plant growth, reproduction, and survival (Côté et al. 2004), and island vegetation has evolved free from the pressure of this herbivory. On other Channel Islands, vegetation shows a rapid recovery following the removal of non-native herbivores, including, for example, mule deer and elk from Santa Rosa Island (Thomson et al. 2022). The scientific literature about islands in general (Donlan et al. 2003), the Channel Islands (McEachern et al. 2009, Thomson et al. 2022), and Catalina Island (Dvorak and Catalano 2016, Dvorak et al. 2016, Jacobsen et al. 2018) indicates that the best course of action from an ecological and biodiversity perspective is complete removal of mule deer.

The prospect of lethal removal of the Catalina Island mule deer population has received criticism, both from those describing it as an inhumane slaughter and from hunting interests

desiring continued recreational hunting and contending that hunting will be adequate to control the deer population. Neither of these arguments against removal is compelling.

The Catalina Island Conservancy proposes a rapid removal of all mule deer. Such an approach involves a range of aggressive but humane hunting techniques that will kill all the animals, estimated at 1,500–2,000, with limited further reproduction. If the deer were left, and recreational hunting continued, an average of 236 deer would be killed per year indefinitely. Those who find the removal plan to be an “inhumane slaughter” are in fact advocating that even more deer will be killed by similar means within 6–8 years and never stopping. In contrast, after the removal plan is implemented, there will be no further killing of deer on the island. As has been shown in successful removal programs on other Channel Islands (Parkes et al. 2010) and around the world, rapid removal of all individuals is the most humane way forward and minimizes the number of animal deaths.

Some hunting advocacy groups also oppose the plan, for the transparent reason that the recreational hunting opportunity would be ended. The harvest rates from recreational hunting (averaging 236 per year) are, however, too low to reduce the population, given the focus of hunters on bucks rather than does, the logistical limits on accessing much of the island as a recreational hunter, even with a guide, and the expense (Stapp et al. 2022). To even start to control the population, hunters would have to kill two to three times as many deer each year indefinitely (only antlerless; see comparable research on white-tailed deer in Simard et al. 2013) to achieve far less benefit for the environment and its unique endemic species than complete removal.

Although contraception has been effective with bison on Catalina Island (Duncan et al. 2013), contraception of a herd of 1,500–2,000 deer would be impractical (Stapp et al. 2022) and would cause far more stress on animals than rapid lethal removal. Individually identified deer would have to be caught and injected by hand or darted from close range in all terrain across the island (Green 2022). Such a program is not feasible. To quote a recent review of the use of contraception to control deer populations, “... the delivery of the immunocontraceptive to free-living park deer in sufficient numbers with accurate identification of individual animals is currently impossible” (Green 2022).

The island conservation research and management community in California and around the world has developed significant experience in efficiently and humanely removing exotic herbivores from islands. Catalina Island’s native birds and other wildlife would benefit substantially from recovery of native vegetation that would become possible with the removal of the introduced deer herd. It is time to take this step toward ecological restoration of Catalina Island.

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***Disclaimer:*** This statement is by the author as an individual; the statements are his own and do not represent a position taken by the University of California, UCLA, or the Institute of the Environment and Sustainability. The UCLA name is used to establish the author’s experience and qualifications pursuant to UCLA Policy 110.

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