



The Wildlife Society
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Mr. Robert C. Hight, Director
California Department of Fish and Game
1416 Ninth Street Sacramento, CA 95814

Subject: A population of the southern (banded) watersnake (*Nerodia fasciata*) in Folsom, California

Dear Mr. Hight:

The purpose of this letter is to provide information about the status of an introduced population of the southern (banded) watersnake that has become established near Lake Natoma in Folsom and offer the support and assistance of the Western Section of The Wildlife Society (TWS-WS) to any efforts taken by the California Department of Fish and Game (DFG) to control this non-native species. The watersnake occurs at Lake Natoma in apparently substantial numbers, and it is possible this snake could adversely affect populations of native fish and wildlife in the Sacramento-San Joaquin Valley and San Francisco Bay Delta if its range expands from its current location. For example, the watersnake could adversely affect populations of the giant garter snake (*Thamnophis gigas*), a species listed as threatened under the Federal and California Endangered Species Acts.

Background Information

The TWS-WS has known these snakes occurred at Lake Natoma for several years. During 1992-93, several watersnakes were captured at a perennial marsh there by Dr. Peter Balfour, a TWS-WS member. He gave the captured individuals to the DFG, and a DFG biologist (recently retired) visited the site several times, collected more snakes, and produced an internal DFG report. Another TWS-WS member, Mr. Eric Stitt, visited the site last spring and found >25 watersnakes ranging between 0.5-1.3 m in length. In a subsequent visit this spring, Mr. Stitt and Dr. Balfour visited several sites in the area and saw more watersnakes; they collected five snakes which were given to the California Academy of Sciences. They determined that the population has dispersed upstream and downstream from its original location.

Dr. Balfour and Mr. Stitt informed the DFG and U.S. Fish and Wildlife Service about the population, and they asked how they should proceed with their work and to offer help in controlling these snakes which they felt represented a potential threat to native species. The DFG provided Mr. Stitt with two reports, one written by the DFG biologist and the other apparently written in June 2000 by a DFG volunteer who was working on this population

too. The DFG authorized Mr. Stitt and Dr. Balfour to take as many snakes as they could, and the DFG provided them with frozen specimens that were collected in 1999 and 2000.

The southern watersnake occurs naturally throughout the Gulf States from Florida to Texas. It is a generalist predator which actively forages on fish, crayfish, frogs, and salamanders; it grows to lengths up to 1.5 m with a heavy body, and can escape quickly. The watersnake bears live young, and is apparently reproducing around Lake Natoma because all size classes (thus age classes) were observed and captured. Dr. Balfour and Mr. Stitt are currently attempting to determine the extent of the watersnake's dispersal and conducting a food habits study using analyses of stomach contents.

Possible Threats to Native Species

Introductions of non-native vertebrates in California have had substantial impacts to native species. For example, bullfrogs (*Rana catesbeiana*) have caused population declines of native frog species¹. Non-native fish introductions into high-elevation lakes have reduced populations of native amphibians² and may be having effects at higher trophic levels³. European starlings (*Sturnus vulgaris*) have adversely affected populations of native cavity-nesting birds⁴, and introduced non-native predators and herbivores are greatly affecting the flora and fauna of California's Channel Islands⁵. The adverse consequences of exotic species introductions resulted in the issuance on February 3, 1999 of Executive Order 13112 which takes a strong position against these introductions and encourages control of non-native species populations.

The watersnake is too large to be preyed upon by native garter snakes, which also generally do not eat other snakes. As far as can be discerned, the watersnake is not known to eat other snakes. It's unknown, however, if the watersnake has displaced native species; non-native species are well known to adversely affect populations of native species once the non-native species is freed from the ecological constraints of its native range. With the watersnake, we do not know if these impacts have occurred because an investigation has not been done to determine its relationships with native species since the watersnake was discovered. While working with the Lake Natoma population, TWS-WS members have found two native garter snakes - the western terrestrial garter snake (*T. elegans*) and common garter snake (*T. sirtalis*) - co-occurring with the watersnake. To date, however, watersnakes have been more frequently observed.

Recommended Actions

The TWS-WS is uncertain if the southern watersnake will displace native species through predation and/or competition. Several types of existing prey available to the watersnake (e.g., bass, sunfish, mosquitofish, crayfish, and bullfrogs) are what they prey upon in their native range. They could, however, potentially prey upon native and sensitive species such as California red-legged frogs (*Rana aurora draytonii*), Delta smelt (*Hypomesus transpacificus*), or Sacramento splittail (*Pogonichthys macrolepidotus*) because of their range and foraging and food habits. Because of the modified habitat conditions in the Sacramento-San Joaquin Valley, Delta, and surrounding foothills, the watersnake could potentially find habitat more suitable than native species such as the giant garter snake, which appears to be increasingly surrounded by non-native species.

The TWS-WS has concluded that the risk to native species from the watersnake is too

great to wait for studies to unequivocally conclude that the watersnake is adversely affecting native species. We feel it is a prudent management decision to assume that the watersnake will adversely affect native species, and that more intensive and active control and management efforts are needed by the DFG and other agencies.

Therefore, the TWS-WS requests that the DFG direct more of its resources to controlling the southern watersnake through an intensive control program that should begin as soon as possible. If control efforts are delayed, costs will increase commensurate with the watersnake's range expansion. The TWS-WS is willing to assist with any control effort that the DFG pursues. The TWS-WS also supports the DFG's efforts to prepare and implement a non-native species control plan that we understand your staff are currently preparing. We have many members who are experts in the ecology and management of non-native species, and we are willing to assist the DFG in preparing this plan and establishing and implementing a statewide control program. I heartily encourage the DFG to contact me at 916-616-0693 if additional information or the assistance and support of the TWS-WS is needed. The TWS-WS thanks the DFG for its leadership with non-native species control and for the opportunity to provide this information and offer our assistance and support.

Sincerely,

Barrett A. Garrison, President

Literature Cited

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- ⁵ Steinhart, P. 1990. *California's wild heritage: threatened and endangered animals in the Golden State*. California Department of Fish and Game, Sacramento, CA. 108 pp.
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