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Chief LaVerne Smith
Division of Endangered Species
U.S. Fish and Wildlife Service
4401 North Fairfax Drive, Rm. 452
Arlington, VA 22203 VIA FAX (703) 358-1735

Re: Federal Register 64(176): 49497-49498, September 13, 1999, Draft recovery plan for the giant garter snake.

Dear Chief Smith,

The Conservation Committee of the Western Section of The Wildlife Society (TWS) has reviewed the draft Giant garter snake recovery plan, and on behalf of the Western Section - TWS, the Committee hereby provides its comments on the Plan.

Recovery Language

Given the way the rest of the Recovery Plan is written, the Western Section-TWS is concerned with the wording in the recovery goal on pages iv and 44: "The ultimate goal of this recovery plan is to delist the giant garter snake." According to Gordon et al. (1998), there have been a number of delisting errors. Because delisting is a bureaucratic goal, and can happen for reasons that are independent of the condition of the species, we suggest that the stated goal of the recovery plan should be to recover the giant garter snake. Delisting is not necessarily the same as recovering the species; it could be a more achievable goal should the Service decide to decide to delist the species based on reasons that are non-scientific.

Habitat Description

The Western Section-TWS objects to the assertions that: (1) The giant garter snake "relies heavily on rice fields in the Sacramento Valley…" (page iv); (2) "Ricelands…provide the most important agricultural habitat for the giant garter snake…" (page 40); and, (3) "Existing habitat includes…ricelands" and "Maintenance of rice cultivation in the Sacramento Valley is considered to be important to the continued existence of giant garter snake in this region." (page 40). The Western Section-TWS can find no convincing evidence that the giant garter snake benefits from rice cultivation in any way, and there is ample evidence that it is harmed by rice cultivation. Using Wylie's telemetry data in his 1998 report, one of us conducted a use and availability analysis and found that the giant garter snake avoids using rice fields based on the availability of rice (Carrier et al. 1999). Also, Table 1 on page 14

shows that giant garter snake densities were highest at Badger Creek, where the landscape is not dominated by rice cultivation. Also, at Badger Creek, the average home range size was one third the size of the average home range sizes at the sloughs and managed marsh in landscapes dominated by rice production. It is well known to wildlife biologists that home range sizes tend to be smaller in areas of higher habitat quality.

It is more reasonable to assume that rice fields are ecological sinks for the giant garter snake, based on the pressures on giant garter snake described on page 27, such as the operation of machinery in farming operations and ditch and canal maintenance. Also, if hazardous substances in Kesterson National Wildlife Refuge are considered a threat to the giant garter snake (page 26), then why not consider agricultural chemicals used in rice cultivation to also be threats to the giant garter snake?

The giant garter snake has declined to the brink of extinction while rice cultivation expanded in the Sacramento Valley. Prior to rice cultivation, the Sacramento Valley produced more alfalfa hay and other crops, and more wetlands were available to the giant garter snake. At this point in time, it is scientifically unfounded to conclude that rice fields serve as good giant garter snake habitat. Based on the scientific evidence, the opposite conclusion should have been reached - rice cultivation is helping to drive the giant garter snake toward extinction. The Western Section-TWS feels that to focus recovery efforts on maintenance of rice cultivation is to assist in the extinction of the giant garter snake.

The Western Section-TWS objects to the over-simplified conclusions that: (1) "The giant garter snake inhabits agricultural wetlands and other waterways…" (pages iv, 22); and (2) "The giant garter snake is an endemic species of wetlands in the Central Valley…" (page 1). Based on the research evidence, this first assertion is backward and incomplete. The giant garter snake inhabits sloughs, low-gradient streams, ponds, lakes, and adjacent uplands that support burrowing animals (Carrier et al. 1997, Wylie 1999, also see pages 20-21 of recovery plan). They also occur in agricultural irrigation canals and ditches, and they rarely occur in rice fields, although there is no evidence these areas are anything but ecological sinks for the giant garter snake. Although the Recovery Plan makes reference to the giant garter snake's use of small mammal burrows (e.g., pages 19, 20, 24), it never identified uplands with mammal burrows as an essential element of giant garter snake habitat (see page 22). The Recovery Plan came close to identifying the importance of small mammals and their burrows when it listed the destruction of rodent burrows as a threat to the giant garter snake (see page 27), but the Western Section-TWS would like to see a more explicit recognition of the importance of burrowing animals in the Recovery Plan.

The occurrence of uplands with small mammal burrows is relatively rare in areas of intense rice cultivation. This rarity of small mammal burrows conflicts with the Service's conclusion that rice is important giant garter snake habitat. Nevertheless, the Service will not likely recover the giant garter snake without implementing strategies to enhance conditions for burrowing animals near the edges of water courses known to be used as habitat by the giant garter snake (Carrier et al. 1997).

According to the Recovery Plan (page 22), the ideal concept of a managed marsh as giant garter snake habitat should include some higher ground resembling ditch banks or rice checks. Also, the Recovery Plan asserts that rice fields may provide important nursery areas for newborn giant garter snakes. The Westsern Section -TWS feels that provisioning of this higher ground is insufficient, as rice checks expose giant garter snakes to their predators too much to be useful, and they are too low to support burrowing animals. Speculating that rice

fields may serve as nursery areas for giant garter snake does not justify using rice fields as the ideal concept of habitat. Making such a leap in logic would be inconsistent with the level of critical thinking that the Western Section-TWS would like to see applied to such an important document. This paragraph should be deleted from the recovery plan.

Similarly on page 23, the Recovery Plan states: "Giant garter snakes now appear to be most numerous in rice growing regions." "Apparently, the giant garter snake can survive in this artificial ecosystem because…" According to Table 1 on page 14, this first assertion is false. Badger Creek has the highest known density of snakes, based on the evidence collected to date. Thirty years ago, prior to the expansion of rice production in the Sacramento Valley, would the Service have used the same evidence to conclude that giant garter snakes now appear to be most numerous in the sugar beet and alfalfa growing regions?

The second assertion is contradicted by the fact that the giant garter snake is going extinct. The scientific evidence contradicts this assertion that giant garter snakes can survive in this artificial ecosystem. (Every ecosystem is artificial, because an ecosystem is a simplification and compartmentalization of environmental elements by scientists.) This paragraph on page 23 should be deleted.

According to the Recovery Plan (page 24), "…radio-telemetered giant garter snakes were located in rice fields 19-20% of the time…" This assertion is correct but incomplete in its interpretation. Smallwood (1999) provided an analysis of Wylie's (1998) telemetry results, employing use and availability methods. The full analyses of these telemetry data show that giant garter snakes avoid rice fields.

On page 28, the Recovery Plan states, "Cattle grazing and irrigated pastures provide the summer water that giant garter snakes require." The Western Section-TWS wonders how this can be? Grazing cattle typically get their water in a trough, and irrigated pasture typically gets irrigated by sprinklers. How can giant garter snakes use the water in either of these cases?

Threats to Recovery

On page 29, the Recovery Plan concludes that the introduced bullfrog may have greatly increased the predation pressure on giant garter snakes. However, the Western Section-TWS notes that bullfrogs in the Central Valley have declined in numerical distribution (Fisher and Shaffer 1996) during the same time giant garter snakes have declined. The recovery plan ought to at least cite Fisher and Shaffer (1996). Also, if introduced species are a threat to the giant garter snake, then some discussion ought to be devoted to the decreased infiltration of introduced species into areas with higher biological integrity (Smallwood 1994).

According to the Recovery Plan (page 30), "Road kills may also be a significant mortality factor in areas where roadways lie in close proximity to giant garter snake populations." The Western Section-TWS feels that road kills are a significant mortality factor in all areas of the Central Valley. Where are giant garter snakes not in close proximity to roads? This proposed mortality factor is supported by much more data than predation as a mortality factor, and it is more substantiated than the assertion that rice is important giant garter snake habitat (which is also criss-crossed by ample roads). Road mortality should be given more prominence in this recovery plan.

According to the Recovery Plan (pages 31, 153), "No grading, excavating or filling can take

place in or within 30 feet of giant garter snake habitat…" On page 25, the recovery plan cites observations of giant garter snakes in mammal burrows 50 and 250 m inland from the water-upland interface. To avoid take of giant garter snakes due to grading, excavating or filling activities, Appendix C needs to be revised accordingly.

Recovery Criteria: Numbers and Social Units

In this Recovery Plan (page v), recovery is achieved when monitoring shows that in 17 out of 20 years, 90% of the subpopulations in four recovery units contain both adults and young. The Service established only this one quantifiable standard for recovery, which actually allows for a 10% loss of existing subpopulations and sets today's conditions as the base line rather than conditions that occurred at the time of listing. Losing up to 10% of extant "subpopulations" cannot possibly recover the species. Furthermore, using location records to define subpopulations lacks scientific foundation, and the Service's use of the term viability is inappropriate (see comments below).

The Recovery Plan states that each population represents "a cluster of discrete locality records" (page 11). The Western Section-TWS believes that locality records are inappropriate for defining functionally significant social units (Smallwood et al. 1999). Also, on page 44, the population is defined as "all giant garter snakes within a basin or area," which is inconsistent with the definition on page 11 and not necessarily consistent with long-standing definitions of population (Odum 1959, Dasmann 1981). Both definitions of population used by the Service are arbitrary and lack scientific foundation.

In the Recovery Plan (page 44), the subpopuation is defined as "a cluster of locality records in a contiguous habitat area." The Western Section-TWS advises that locality records are inappropriate for defining functionally significant social units (Smallwood et al. 1999). Also, given the Service's conclusions about giant garter snake habitat, what comprises a contiguous habitat area? Would two rice fields separated by a sugar beet field be considered as two habitat areas that possibly support two subpopulations of giant garter snake?

According to the Recovery Plan (page 46), detecting both adults and young in a given subpopulation suggests that the subpopulation is viable. The Service's view of viability lacks scientific foundation, and is arbitrary. It is also prone to abuse, because the detection of one adult and one young snake can, based on the Service's definition, be considered a viable subpopulation. Smallwood et al. (1999) provides useful references into the literature on Population Viability Analysis, and what conditions suggest a social unit is viable.

According to the Recovery Plan (pages 1, 11), there are 13 recognized populations of giant garter snake in the Central Valley. Were the 13 populations identified by location records, or by basin or area boundaries? The operational units of the recovery plan need to be clearly defined.

According to the Recovery Plan (page 10), giant garter snakes in the San Joaquin Valley "… are in extremely low to undetectable numbers." What are "undetectable numbers?" The Central Valley south of the Sacramento area has been searched for giant garter snakes with much less effort than in the Sacramento area. Undetectable numbers are simply numbers that have not been pursued by biologists in the San Joaquin Valley. Based on disproportionate search efforts in the Central Valley, the Service can only speculate that giant garter snakes have declined in the San Joaquin Valley faster than suitable habitat (page 25).

According to the Recovery Plan (page 46), "It is not possible to establish population numbers as a delisting criterion for giant garter snake." The Western Section-TWS believes that it is possible to do so. On pages 14 and 15, the recovery plan lists various estimates of population size in various locations. Carrier et al. (1999) provided an analysis of garter snake density estimates, and discussed how their analysis can be applied to estimating the capacity of land units to support the giant garter snake. This analysis was provided to the Service, and was based on accepted scientific methods (Smallwood 1999). A recovery plan can and should make use of population numbers in setting recovery criteria.

According to the Recovery Plan (page 44), data needed for establishing recovery criteria are mostly lacking. The Western Section-TWS feels that many of the data were ignored in this recovery plan, and many were used inappropriately. Data and scientific interpretation of data were provided by Carrier et al. (1997, 1999), but none of these data nor their interpretation were cited or used in any way in this recovery plan. For example, the recovery plan cites Turner (1977) as a source of density estimates for various species of snake, even though Carrier et al. (1999) informed the Service that it is inappropriate to use or compare density estimates when the study area sizes used to make the density estimates were not provided in the report. Carrier et al. (1999) provided the Service with an integrative analysis of density estimates, which can be used to predict the number of giant garter snakes occurring in high quality habitat, so long as the habitat is free of toxic substances or other factors that can degrade giant garter snake populations.

The Recovery Plan asserts that Population Viability Analysis can refine recovery criteria (page 42). Population Viability Analysis is typically performed prior to a recovery plan, not afterwards or as part of the research that is supposed to somehow feed into adaptive management. The Western Section-TWS recommends that PVA be performed now, prior to issuance of the final draft recovery plan. A PVA later would not be very helpful, because as the Service's version of adaptive management is implemented, the options for conserving the species will be reduced.

Recovery Criteria: Habitat Availability

Carrier et al. (1997) integrated natural history observations and scientific investigations related to habitat. They found some disparity in views on what environmental conditions compose habitat, but they also found common views, such as the need for animal burrows in upland areas adjacent to the water's edge. Carrier et al. (1997) offered a scientific means for reducing the uncertainty in habitat descriptions, which would have been very useful in this recovery plan. In concluding the data are mostly lacking fore designating habitat, the Service appears to rely on adaptive management to conserve the giant garter snake. However, the Service also defined adaptive management improperly.

On pages v and 42, the Recovery Plan claims that adaptive management of supporting habitat will serve as a recovery criterion. The Conservation Committee points out that the Service has come up with its own definition of adaptive management (page 42), which is different from the definitions provided in the scientific literature (Smallwood et al. 1999). The Service describes adaptive management as post-hoc changes to the management practices based on new information from research or failed practices that were already implemented. In other words, the Service intends to correct mistakes in their recovery plan as they learn of the mistakes. How can this version of adaptive management contribute to recovery of the giant garter snake? The Service's version of adaptive management is the very antithesis of a plan, and it is unscientific because it is reaction to trial and error rather than a

structured, experimental approach to reducing uncertainty.

Recovery Criteria: Habitat Conservation Plans

According to this Recovery Plan (page 32), several Habitat Conservation Plans should play a significant role in giant garter snake recovery efforts. However, according to the HCP Handbook (USDI and USDC 1996), HCPs do not have to contribute to species recovery. The Yolo County HCP (EIP Associates 1996) and the Natomas Basin HCP (US Fish and Wildlife Service 1997) do not. These and other HCPs are mitigation plans for take, including the take of giant garter snakes and their habitat. Under these HCPs, there is a net loss in habitat area within the range of the giant garter snake. There is little chance the HCPs will "protect, manage and monitor large tracts of riceland currently occupied by the giant garter snake." So far, the conservancy responsible for mitigating under the Natomas Basin HCP has only managed to locate a few hundred acres, which was neither riceland nor wetland. The Yolo County HCP proposes to obtain easements on farmland for continued production of annual field crops and on land in the Yolo Flood Basin, where giant garter snakes are known not to occur due to the periodic inundation that prevents the establishment of occupancy by burrowing animals.

The Yolo County HCP and Natomas Basin HCP were prepared without use of the best available scientific data, and they violated the Endangered Species Act in numerous additional ways (Smallwood et al. 1999). For example, the mitigation ratios are not the same among these HCPs and the Service prepared these HCPs (rather than the take permit applicant). Even though the best scientific data were prepared and available to the Yolo County HCP (Smallwood et al. 1998), they were not used.

The Recovery Plan states that "…protection should first focus on publicly owned lands" (page 41). The Western Section-TWS feels that giant garter snakes are most threatened on private lands. Therefore, we ask why focus protection efforts on public lands? Protection efforts under a recovery plan should be directed to where they will be most effective, not where they will be convenient.

Recovery Tools: Conserving Non-federally Listed Species as Surrogates

The Service claims that the giant garter snake recovery plan will benefit the Tricolored Blackbird, White-faced Ibis, Western Pond Turtle, and waterfowl (pages iv, 1). It presents specific tasks, which include conservation efforts directed toward Tricolored Blackbird, White-faced Ibis, Western Pond Turtle, and waterfowl (pages 50-58), and which will presumably benefit the giant garter snake. It then provides descriptions of the biology of Tricolored Blackbird, White-faced Ibis, Western Pond Turtle, and waterfowl (pages 91-152). Because this is a recovery plan for the giant garter snake, discussing the benefits of the plan to species of special concern and waterfowl is irrelevant. The Western Section-TWS recommends deletion of pages 91-152.

More troubling to the Western Section-TWS is the switch of conservation emphasis. Early in the recovery plan (page iv), the Service suggests these additional species will benefit from giant garter snake recovery efforts. Later (pages 50-58), the Service suggests the giant garter snake will benefit from specific conservation tasks directed toward the species of special concern and waterfowl. The Service appears to have taken the view that giant garter snakes use the same habitat as these other species, which is principally open water. This view is erroneous; it is contrary to the scientific evidence (Carrier et al. 1997, 1999; Wylie 1999).

Representing the habitat needs of one or more species by the habitat of another is inappropriate in a Habitat Conservation Plan (Smallwood et al. 1998), but to do so in a Recovery Plan is even more inappropriate. There is no shortcut to scientifically describing the habitat of a species (Simberloff 1998, Smallwood et al. 1999). Implementation of conservation tasks directed towards these other species also squanders the personnel time and financial resources needed for recovering the giant garter snake. The recovery plan for the giant garter snake should focus on the giant garter snake, and on no other species as surrogates.

Recovery Tools: Survey Protocol

According to the Recovery Plan (pages 31, 155), surveyors of giant garter snake and evaluators of their habitat are considered qualified by the California Department of Fish and Game and the Service when they have demonstrated previous field experience with giant garter snake, and they must possess a valid Scientific Collecting Permit. This requirement is unprecedented in our experience, and places our ability to survey for the giant garter snake and to evaluate its habitat at the mercy of the government regulatory agencies. The Western Section-TWS wonders why a Scientific Collecting Permit would be needed to conduct visual surveys? Why would habitat analysis be restricted to field biologists who have an Endangered Species Permit? Habitat evaluation has been conducted by many types of scientists, not just field biologists with an Endangered Species Permit. The Western Section-TWS is particularly concerned with Appendix D, and sees it as written as a threat to good biology on endangered species. The Western Section-TWS would like to see some significant clarifications of this Appendix D, and we would like to see an appeals process for wildlife biologists who have been denied these permits by the agencies.

Recovery Tools: Repatriation

According to the Recovery Plan (pages 42, 47, 62-63), recovery of the giant garter snake may require repatriation (reintroduction) into suitable habitat within the species' historic range. The Western Section-TWS points out that repatriation has a dismal history of success (Griffith et al. 1989), especially for species of amphibians and reptiles (Dodd and Siegel 1991, Reinert and Rupert 1999). It will likely result in take of giant garter snake from areas already occupied, because these individuals will perish for the same reasons that caused their local extirpation from vacant "suitable" habitat in the first place. Furthermore, the Service should heed the recommendation of George Hansen that giant garter snakes not be translocated from the American Basin due to documented parasite loads (see page 30), and his recommendation should be extended to all areas of the geographic range of the species. Translocations can spread disease and should not be practiced in a Recovery Plan unless the receiving area is free or nearly free of the target species.

Recovery Tools: Safe Harbor

According to the Recovery Plan (page 51), protecting rice farming through Safe Harbor Agreements will contribute to the recovery of giant garter snake. Safe Harbor Agreements allow for take of listed species (Smallwood 1997), which the Western Section-TWS feels is inappropriate in a recovery plan, and contrary to recovery goals. Safe Harbor Agreements can allow rice farmers to destroy habitat previously created and to translocate the giant garter snake, which, perhaps, would be convenient for the recovery strategy of repatriation to areas of vacant "suitable" habitat. Safe Harbor Agreements have no place in a recovery plan.

Citation Inconsistencies

The citations of Hansen (1995), Holland (1991), Holland (1992), Saiki et al. (1992) and Central Valley Regional Water Quality Control Board (1992) did not appear in the Literature Cited section (see pages 26, 28, 29, 31). Also, the Literature Cited section included Avise (1996), Bennett et al. (1993), Boundy (1990), CDFA (1992, 1996), California Regional Water Quality Control Board, Central Valley Region (1992), Frankham (1995), Frayer et al. (1989), Hansen (1982), Johnson (1947), Lande (1993), Parmley and Mulford (1985), Peteron and Nebeker (1992), Szaro et al. (1985), US Fish and Wildlife Service 1991, 1997, 1997b), Proceedings of the California Academy of Science, Wilcox and Murphy (1985), but all these references did not appear in the text. Summary

In selectively choosing data and references to suit their arguments, the Service did not use the best scientific data in this recovery plan (Smallwood et al. 1999). The result was a recovery plan replete with inaccuracies and internal contradictions that will likely confuse and impede recovery efforts. The Western Section-TWS requests that the Service use more of the available scientific data, and that they do so appropriately, for this Recovery Plan. The Western Section-TWS would be willing to assist the Service in these efforts.

References

Carrier, W. D., K. S. Smallwood, and M. L. Morrison. 1997. Natomas Basin Habitat Conservation Plan: Narrow channel marsh alternative wetland mitigation. Report to Northern Territories, Inc., Sacramento. Nine pages and iii illustrations.

Carrier, W. D., M. L. Morrison, K. S. Smallwood, and Vail Engineering. 1999. Recommendations for NBHCP land acquisition and enhancement strategies. Report to Northern Territories, Inc., Sacramento.

Dasmann, R. F. 1981. Wildlife biology, 2nd ed. New York, NY, USA: John Wiley & Sons. Dodd, C. K., and R. A. Seigel. 1991. Relocation, repatriation and translocation of amphibians and reptiles: are they conservation strategies that work? Herpetologica 47:336-350.

EIP Associates. 1996. Yolo County Final Habitat Conservation Plan: A plan to mitigate biological impacts from urban development in Yolo County. Sacramento, California.

Fisher, R. N., and H. B. Shaffer. 1996. The decline of amphibians in California's Great Central Valley. Conservation Biology 10:1387-1397.

Gordon, R. E., Jr., J.K. Lacy, and J. R. Streeter. 1997. Conservation under the Endangered Species Act. Environment International 23:359-419.

Griffith, B., J. M. Scott, J. W. Carpenter, and C. Reed. 1989. Translocation as a species conservation tool: status and strategy. Science 245:477-480.

Odum, E. P. 1959. Fundamentals of ecology. Philadelphia, PA, USA: W. B. Saunders Company. Reinert, H. K. and R. R. Rupert Jr. 1999. Impacts of translocation on behavior and survival of timber rattlesnakes. Crotalis horridus. Journal of Herpetology 33:45-61.

Simberloff, D. 1998. Flagships, umbrellas, and keystones: Is single-species management pass¾ in the landscape era? Biological Conservation 83:247-257.

Smallwood, K. S. 1994. Site invasibility by exotic birds and mammals. Biological Conservation 69:251-259.

Smallwood, K. S. 1997. Multi-species effectiveness due to proposed mitigation designs for the Natomas Basin HCP. Report to Northern Territories, Inc., Sacramento, CA. 7 pages.

Smallwood, K.S. 1997. Science missing in the "no surprises" policy. Commissioned by National Endangered Species Network and Spirit of the Sage Council, Pasadena, California.

Smallwood, K.S. 1999. Scale domains of abundance among species of Mammalian Carnivora. Environmental Conservation 26: In press.

Smallwood, K.S., J. Beyea and M. Morrison. 1999. Using the best scientific data for endangered species conservation. Environmental Management In press.

Smallwood, K.S., B. Wilcox, R. Leidy, and K. Yarris. 1998. An Indicator of ecological integrity across large areas: a case study in Yolo County, California. Environmental Management 22: 947-958.

Turner, F. B. 1977. The dynamics of populations of squamates, crododilians, and rhynchocephalians. In Gans, A.C. and D. W. Tinkle, eds. Biology of the Reptilia, Volume 7, Ecology and behaviour. Academic Press, London.

USDI and USDC. 1996. Endangered Species Habitat Conservation Planning Handbook. U.S. Department of the Interior and U.S. Department of Commerce, Washington, D.C.

U.S. Fish and Wildlife Service. 1997. Natomas Basin Habitat Conservation Plan. US Fish and Wildlife Service Sacramento Field Office, Sacramento, California.

Wylie, G. 1998. Giant garter snake project: 1998 progress report. US Geological Survey, Biological Resources Division, Dixon Field Station.