

# Executive Summary

## Proposed Changes to the Natomas Basin Habitat Conservation Plan's Biological Effectiveness Monitoring Program Document

Introduction. Biological effectiveness monitoring has now been underway since the early years of the Conservancy. The monitoring protocols currently used were first developed in 2004 as a part of the revised NBHCP where an NBHCP Program Document was required. Minor updates to these protocols were completed in 2006 and 2009, and the giant gartersnake protocols were revised in 2011. Although implementation of these protocols has been successful, a great deal of experience has been gained since 2004 in the design of monitoring protocols for large-scale HCPs. Analytical techniques have also advanced, which allow more efficient use of resources with better outcomes. In addition, Conservancy knowledge of the Covered Species in the Plan Area has increased substantially.

Objectives. The Conservancy recently engaged in a rigorous process to evaluate and revise the biological monitoring program with the objectives of, 1.) improving efficiency, 2.) strengthening the ties between monitoring and management (i.e., improving the adaptive management process), and 3.) controlling costs.

Method of approach. The process included reviewing the goals, objectives, and directives in the NBHCP to ensure continued compliance with its terms and conditions, provide the background needed to understand the current monitoring program, and to inform the rationale behind proposed changes. Then, for each Covered Species or group of species, the first years of information obtained from the monitoring program were reviewed, management actions or potential management actions were identified, and areas where knowledge of the ecological systems needed improvement were identified, with the objective of developing conceptual models to formalize understanding of the system. On the basis of these reviews, monitoring options were identified and recommendations were made for changes to the monitoring program.

Results and revisions, plant species. In the proposed revision to the NBHCP Program Document, the habitat and land cover mapping protocols were left unchanged. The floristic and noxious weed inventory protocols were modified to exclude monitoring of agricultural lands because these fields are not habitat for covered plant species and are regularly disturbed, with weeds treated and removed.

Results and revisions, Giant garter snake. The proposed BEMP Program Document's giant garter snake monitoring protocol was updated to take advantage of advances in analytical techniques developed over the last several years. Demographic monitoring, which comprised over half of the monitoring effort under the previous protocol, provided excellent information on demographic rates, which can be useful in pinpointing the causes of population declines should they occur. However, the intensive nature of demographic monitoring allowed for sampling at only five sites, which were not necessarily representative of habitats on reserve lands. The proposed new monitoring protocols employ a hybrid occupancy monitoring and demographic monitoring approach. This approach allows for a substantially larger, randomly-selected sample of wetland units and canals associated with rice agriculture to be monitored (within reserve lands). This will allow for better estimation of the relationship between giant gartersnake presence and/or abundance with habitat variables at each wetland unit/rice canal sampled. In cases where sample sizes are large enough, estimation of demographic rates will still be possible.

Results and revisions, Swainson's hawk. In the proposed revision to the BEMP Program Document, Swainson's hawk monitoring protocols were left unchanged in the proposed revised BEMP Program Document. The data collected provides a complete census of the population each year, which facilitates relatively robust evaluations of population performance at a comparatively small cost.

Results and revisions, other Covered Species. In the proposed revision to the BEMP Program Document, t monitoring protocols for other covered species were modified in several ways. The general approach was maintained while reducing the number of surveys per year by eliminating surveys in months and habitats where species use is minimal. The Basin-wide survey of the South Basin was also eliminated because no covered species have been detected in this area, with very minor exceptions.