Environmental Management of the Arroyo Seco Improvement Program

Executive Summary

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The Arroyo Seco Improvement Program (ASIP) involves the restoration of the Arroyo Seco, an intermittent stream that flows through the Sandia National Laboratories site located in Livermore, California (SNL/CA). SNL/CA is a multi-mission laboratory managed and operated by National Technology & Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International Inc., for the U.S. Department of Energy's National Nuclear Security Administration. The purpose of this project is to manage and perform restorations for the segments of the stream within the SNL/CA boundaries; as well as to meet the required performance criteria outlined by the Army Corps of Engineers (ACOE) and the San Francisco Regional Water Quality Control Board (SFRWQCB). My report describes my involvement as program lead, subject matter expert, and delegated representative for the implementation, monitoring, and reporting of the ASIP. In my report, I've included data from the years I was involved in the program, ranging from 2020 to 2023, as well as reporting from 2014 as a means for baseline comparison.

The modification of the Arroyo Seco became necessary due to significant erosion issues, including impacts to road bridges, foot bridges, and utility crossings. Before any modification to the stream could be performed, regulatory requirements per the Clean Water Act dictated that any work in the Arroyo Seco or in its related vicinity would require permits and review from the ACOE, SFRWQCB, and USFWS. Objectives and requirements were issued by the approved ASIP plan, BOC, and supplied permits. The agreed upon objectives of the ASIP are as follows (Dicker, 2021):

- Correct existing channel stability problems associated with current Arroyo structures (i.e., bridges, security grates, utility crossings, and drain structures).
- Correct bank erosion and provide protection against future erosion.
- Reduce the risk of future flooding.
- Provide habitat improvement and creation of a mitigation credit for site development and management activities per the approval of USFWS and the SFRWQCB. This is due to the ASIP being self-mitigating which will create and/or enhance floodplains, ponds, and riparian habitats over its 1,800 linear feet channel.

Based on these objectives, the ASIP was divided into 17 project sections (Figure 1). Each project had construction related work to correct the Arroyo Seco's stream flow, banks, and streambed. The construction of these projects was completed in September of 2015, and approximately 5.4 acres of net gain of

riparian habitat was achieved (Baker, 2023). However, final completion of the ASIP cannot be accomplished until the established success criteria are met for each of the 17 project sections. SNL/CA is required to monitor and maintain the individual project sites for a minimum of ten years from the completion of the individual projects, or until compliance with the ASIP performance goals as defined in the RWQCB Clean Water Certification are achieved. Native plantings related to the performance criteria included but are not limited to willows, Coastal Live Oaks, Valley Oaks, Fremont Cottonwoods, California Sycamore, maples, Blue Elderberries, California Buckeye, and native grass seed mixtures (Baker, 2023). To evaluate the suitability of the habitats in the ASIP restoration areas to support common and special-status wildlife species, various assessments are performed. These assessments include the deployment of mammal camera trapping device (game camera), bird surveys, amphibian surveys, and bat acoustical surveys (SNL/CA, 2023). Biodiversity and relative abundance of wildlife species information gathered from the SNL/CA ASIP areas are compared with non-restoration sites (control).

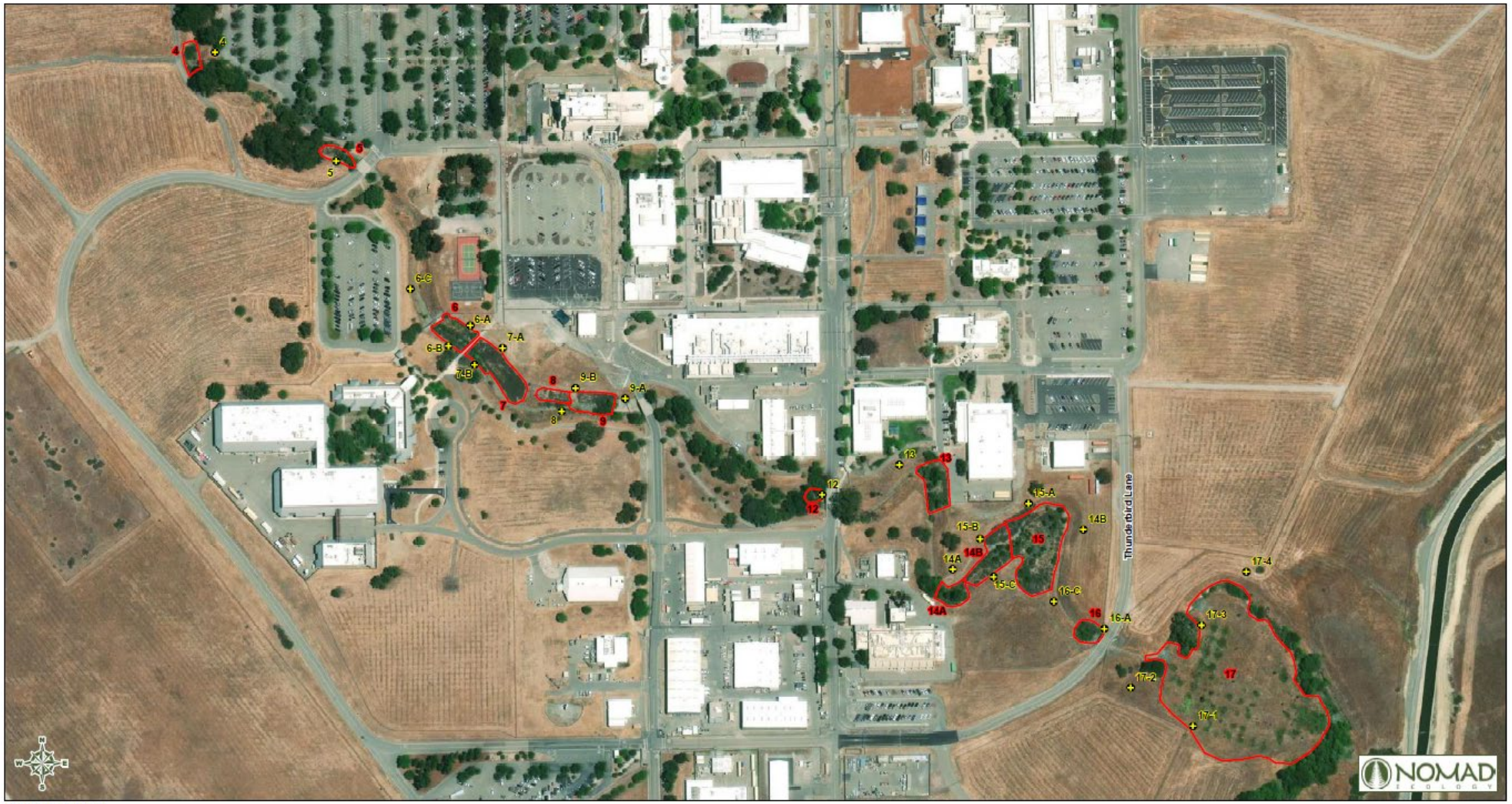

Figure 1: ASIP Project Areas (SNL/CA, 2023)

Based on project data, the Arroyo Seco has shown improvements over the reporting years 2020 through 2023 when compared to the 2014 baseline reporting year. Numerous project sites have fulfilled their performance criteria and have been considered complete. Additionally, when comparing wildlife in the restoration sites to the control sites, a significant increase is observed in the restored areas. Now, the SNL/CA team is in the process of acquiring funds and scheduling improvements for the remaining ASIP sites. Suggested improvements include irrigation enhancements, soil and plant studies for currently active project areas, leverage shade, and nutrient supplementing.

This project allowed me the opportunities to grow my knowledge base in stream restoration and vegetative planting, as well as to engage and coordinate with regulators, such as the ACOE and SFRWQCB. It also was a great exercise in managing a large and long-term project's funding, monitoring, and reporting requirements. Through my involvement, SNL/CA gained continuation of the program's requirements, grew in program funding, gained further insight of program's current status, and acquired resources to enhance the needs of the program.

References

Dicker, Deanna M. *Arroyo Seco Improvement Program Annual Report for 2020*. United States: N. p., 2021. Web. doi:10.2172/1760342.

Baker, Alexandra M. *2022 Arroyo Seco Improvement Project Annual Report*. United States: N. p., 2023.