

Appendix G
Data Collection and Data Gap Assessment

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To ensure development of a comprehensive Salinas River Long-Term Management Plan (LTMP), the Monterey County Water Resources Agency (MCWRA) and its technical consultants compiled and reviewed an extensive suite of existing technical reports, management plans, and research related to natural resource management in the study area. This appendix summarizes the data review process employed, provides a discussion of data gaps identified through the review and LTMP development process, and lists future possible studies that could help inform long-term management of the Salinas River.

G.1 Data Collection

Based on the LTMP's goals of documenting the historical conditions in the Salinas River watershed, describing the existing conditions, and informing development of a future MCWRA habitat conservation plan (HCP), MCWRA and its technical consultants identified, collected, and reviewed numerous documents that could potentially provide information for, or guidance on, LTMP development. This process was initiated at the outset of LTMP development and was continued throughout. Recommendations for document review were primarily provided by MCWRA staff, but suggestions and materials were also provided by stakeholders through the planning group and working group meetings. Documents were also provided by the technical team and found through internet research. All collected sources were briefly reviewed for content and tracked. The following section lists resources reviewed but not ultimately used in LTMP development (sources that were used are listed in Chapter 6, *References*). Documents and data sources spanned several decades and included many MCWRA publications including reports on water quality, river flow, groundwater monitoring, biological assessments, environmental impact reports, management plans, fisheries, engineering, facility operations, and budget reports.

As described in Chapter 1, *Introduction*, MCWRA established a stakeholder engagement process to support development of the LTMP. Through the many planning group and working group meetings, MCWRA collected valuable information and insights on the many management issues affecting the Salinas River. These issues, as discussed and examined through the stakeholder engagement process, are captured in LTMP Chapter 4, *Management Plan*, and Chapter 5, *Implementation*. In some instances, stakeholders also recommended documents for review. If these documents were not cited in the LTMP chapters, they are included in this appendix.

G.1.1 Sources Reviewed but Not Cited in the Long-Term Management Plan

The following documents, permits, and websites were reviewed but not ultimately used in LTMP development.

G.1.1.1 Documents

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G.1.1.3 Websites

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G.2 Data Gap Assessment

Below is a summary of the data gaps revealed through the literature review process and through technical team recommendations. These data gaps were not explicitly discussed with the planning group and thus were not included in Chapter 4, *Management Plan*. These data gaps are additive to the management actions identified in Chapter 4, and there may be value in considering these data gaps as potential management actions during LTMP implementation.

- **Arroyo Seco habitat assessment.** The Arroyo Seco and its tributaries are believed to support the majority, if not all, of the spawning habitat for South-Central California Coast steelhead (steelhead) in the Salinas River watershed in the management area. While some surveys have been conducted in the Arroyo Seco and its tributaries, these surveys were not intended to determine the amount of habitat available to support spawning and rearing steelhead or to determine whether steelhead could pass the natural migratory barrier in wet years. A thorough examination of available habitat would allow an estimation of the potential carrying capacity of steelhead in the Arroyo Seco.
- **Arroyo Seco HEC-RAS flow model.** Data is lacking regarding hydrologic factors for the Arroyo Seco subwatershed. These factors directly affect how management activities for steelhead and their associated habitat requirements (i.e., stream topography, flow velocities) should be conducted. Development of a surface water flow model would help to better understand these habitat requirements. In order to develop such a model, one essential component that has yet to be incorporated into the model for these watersheds is a review of the latest LiDAR data. With this data, the model can be updated to run simulations for current and future water years and provide information to analyze habitat management measures for steelhead. LiDAR collection and processing and a field survey to spot check LiDAR results will be required. Once this data is collected and incorporated into the model, additional simulations can be configured and analyzed to support steelhead management measures.
- **Additional stream gage installation.** There are only four gages on the mainstem of the Salinas River. Of the Salinas River's undammed tributaries in the study area, only the Arroyo Seco and San Lorenzo are gaged. Installation of additional stream gages on the Salinas River mainstem and on key tributaries would help to better understand how water moves throughout the Salinas River basin (above and below ground).
- **Fish flow model.** Develop a model for the Salinas River watershed to inform management of instream flow conditions to support steelhead migration, spawning, and rearing habitat. The model should consider the interaction of surface water and groundwater, including—but not limited to—channel substrate, gaining/losing reaches, location of water diversions, and groundwater pumping.
- **Evapotranspiration study.** Based on at least one study in other parts of California (Abichandani 2007), it is believed that *Arundo donax* (Arundo) consumes, and subsequently releases to the atmosphere, quantities of water so significant that they substantially affect the

volume of instream flow. A study specific to rate(s) of evapotranspiration on the Salinas River, including its *Arundo* infestation, would help inform the fish flow model recommended in the preceding bullet.

- **Riparian tree loss analysis.** Members of the Salinas River Stream Maintenance Program River Management Unit Association have noted anecdotally a substantial loss in riparian woodland habitat, specifically cottonwood trees, on the Salinas River mainstem over the last 5 years (a period marked by extended drought). Robust riparian mapping predated this period of loss. Updated surveys are needed to determine the current status of riparian woodland habitat. Older survey data could serve as a baseline against which to assess the riparian woodland reduction, and to identify possible biological trends that are relevant for future river management actions. Once a reduction in riparian woodland habitat is confirmed, further study should investigate the cause of the loss.
- **Expanded historical ecology study.** The historical ecology study of the Salinas River completed by the San Francisco Estuary Institute (2009) covers only the lower portion of the Salinas River, from just downstream of the confluence with the Arroyo Seco to the Monterey Bay. A complete historical study, including the upper reaches of the river, is recommended to inform future management actions, and in particular, river and riparian restoration. Historical information on the main tributaries to the Salinas River would also be valuable in better understanding the system as well as the history of the floodplain.
- **Least Bell's vireo surveys.** Least Bell's vireo is a federally endangered species once known to occupy the riparian forests of the Salinas River. It is unknown whether these birds persist in the management area. Surveys for least Bell's vireo would help inform management actions on the Salinas River, as well as the forthcoming HCP.
- **Salinas River Lagoon habitat assessment.** A number of management actions in Table 4-1 call for Salinas River Lagoon assessments (i.e., water elevation, existing infrastructure, water quality as related to breaching, bathymetry, wetland restoration opportunities); however, none of these specifically address the location and quality of habitat for the different species that use the lagoon for all or portions of their life stages. A Salinas River Lagoon habitat assessment would inform other management actions (e.g., water quality, wetland restoration), but would also support the conservation strategy to be developed under the forthcoming HCP.