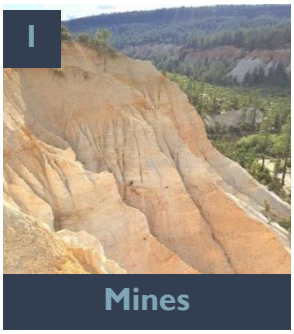
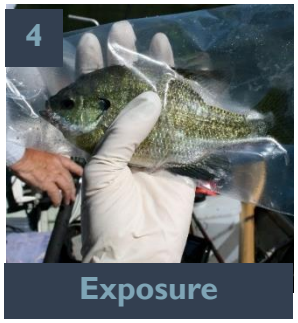
Headwater Mercury Source Reduction Strategy

EXECUTIVE SUMMARY

The Headwater Mercury Source Reduction (HMSR) Strategy is a cohesive framework for collaboration on projects that address four strategic targets to reduce mercury discharge from the Sierra to the Bay-Delta: (1) ***Hydraulic Mines and Mine Features****, (2)* ***Mercury in Forest and Land Management****, (3)* ***Mercury-Contaminated Sediment in Reservoirs****, and (4)* ***Mercury Exposure****.*





The 19th century Gold Rush forever changed the landscape of California's headwaters with a disturbance regime of epic proportions. Forests were clear-cut, streams dammed and diverted, entire hillsides washed away with hydraulic monitors, and millions of pounds of mercury imported for use in gold processing were lost to the environment. Mercury contamination is the most persistent and widespread impact of the Gold Rush and since 2006 The Sierra Fund (TSF) has worked to increase the visibility of this issue. Since 2016, when the Bay-Delta Mercury Strategy Synthesis identified that no cleanup for mercury in the Bay would be successful without upstream source control, TSF has been working to reduce mercury discharge from the Sierra Nevada.

The HMSR Strategy catalyzes a scientific approach to characterize the source and transport of legacy mercury, from the Sierra to the sea. The Strategy is operationalized as a living document, an active HMSR Technical Advisory Committee (TAC) and a biennial *Reclaiming the Sierra Conference*. This work builds on over a decade of research, actions, and methods, providing a framework for technical experts to share, revise, and integrate best-practices for the assessment and mitigation of mercury. By documenting and updating an informed approach, the Strategy can be improved and leveraged toward the identification and execution of priority projects. The lasting goal of HMSR is to protect and restore ecosystem and community resiliency in the Sierra Nevada - to the benefit of both regional and downstream stakeholders.

Key overarching actions have been identified for the targets of the HMSR Strategy in order to provide direction to regional activities to address mercury:

1. **Develop inventories of locations and site characteristics** of hydraulic mines and mine features, forest areas with mine impacts, mercury-impacted reservoirs, and fishing destinations posing a high risk of exposure. This is achieved through desktop geospatial analysis, compilation of existing data, and on-the-ground verification as relevant.

2. **Conduct baseline sampling so that changes in mercury metrics can be monitored across time** and across targets, including sampling for mercury in water, soil, sediment, biota, and fish and conducting angler surveys to quantify socioeconomic variables and angler knowledge and understanding of mercury exposure risk.

3. **Develop pilot projects to evaluate best-practices** for reducing sediment and mercury transport at hydraulic mines and across fuel-laden forested lands; for removing contaminated sediment from reservoirs to recover water

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storage capacity; and for preventing human exposure by increasing the amount and accessibility of fish advisories and other information about safe local fish consumption.

4. **Prioritize locations for implementation activities** so that resources and expertise are directed to projects for each mercury target that will result in the greatest regional benefit.

5. **Conduct post-implementation sampling so that project outcomes can be evaluated**, leading to new best practices to reduce headwater **sources** of mercury, downstream **transport** of mercury, and human **exposure** to mercury from the Sierra to the sea.

The HMSR Strategy is evaluated annually based on progress toward target-specific criteria…

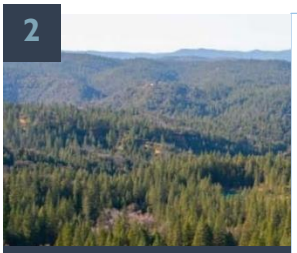
1

Mines

Evaluation Criteria

- Inventory one sub-watershed per year in partnership with public or private landowners.
- Remediate one hydraulic mine site per year in partnership with public or private landowners.
- Integrate best-practices into regional and regulatory planning efforts such as the Reservoir Mercury TMDL.

2



Forests

Evaluation Criteria

- Develop assessment criteria to evaluate forest management activities on sediment and mercury discharge
- Conduct planning for, design and/or implement one pilot project per year that integrates fuels reduction with hydraulic mine remediation activities.
- Develop best-practices for fire-safe revegetation of mine-contaminated soils.

3

Reservoirs

Evaluation Criteria

- Support development of one reservoir sediment removal project per year
- Identify and characterize mercury-reduction best-practices for reservoir maintenance
- Integrate mercury best-practices into monitoring plans for sediment removal projects
- Share monitoring strategies and best-practices to support projects in other regions
- Integrate best-practices into regional and regulatory planning efforts such as the Reservoir Mercury TMDL.

4

Exposure

Evaluation Criteria

- Fill fish tissue data gaps and provide data to the Office of Environmental Health Hazard Assessment to develop one new advisory per year for the headwaters.
- Post fish consumption advisories annually at Sierra Nevada water bodies in English, Spanish, and additional languages as informed by angler surveys.
- Conduct outreach to vulnerable communities and other regions about fish tissue mercury levels, best practices and lessons learned.

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