



# FACT SHEET

No. 17

## Rangeland Watershed Program

U.C. Cooperative Extension and USDA Natural Resources Conservation Service

### Water Quality Standards and Livestock

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#### Water Quality Standards

The Clean Water Act's Section 303 requires states to establish water quality standards, and Section 304 directs the Environmental Protection Agency to provide criteria to the states to help establish their water quality standards. Each state must review their water quality standards every three (3) years, and the standards must be approved by EPA. If not approved, EPA can step in with standards. California water quality standards are set in the Porter/Cologne Act and are called "Water Quality Objectives."

A water quality standard is a law or regulation that: 1) identifies the beneficial designated use or uses of a water body or its segment and 2) the water quality criteria necessary to protect the use(s) of that water body. The standards must also contain an antidegradation policy.

Water quality standards may be numerical or narrative. Most standards are for toxics, such as heavy metals (lead, mercury, etc.), chemicals, and pesticides. These pollutants are not typically associated with livestock grazing or ranch practices.

#### Designated Beneficial Uses and Impairments

Protecting a beneficial use is the basis for water quality standards, and standards can be different for different uses. Beneficial uses of water most likely to be impaired by livestock are:

- Domestic water supply
- Cold water fisheries
- Spawning habitat of anadromous fish

The following water quality elements are the most sensitive to livestock grazing:

- Sediment
- Nutrients
- Temperature
- Dissolved oxygen
- Streambank stability
- Riparian habitat

#### Water Quality Criteria

The following criteria which relate to livestock activities are suggested by EPA for use by states to set water quality standards (objectives) for specific water bodies.

##### Sediment

Sedimentation standards are set in units of turbidity.

Turbidity refers to the amount of light that is reflected or absorbed by water and is measured in nephelometric turbidity units (NTUs).

Turbidity may not exceed 1 NTU for drinking water.

Where freshwater fish are present, turbidity may not exceed the established

normal by more than 10%. Since background levels are seldom defined, these standards are ambiguous and hard to enforce. Probably only continuing major violations would be identified.

**Nitrogen**

Forms of nitrogen found in aquatic systems are **nitrate, nitrite, and ammonia**.

No standards have been set for nitrite because it is quickly transformed by microbes into nitrate.

The level of nitrate must be no greater than 10 mgL<sup>-1</sup> (10ppm) of N from NO<sub>3</sub>, or 45 mgL<sup>-1</sup> (45ppm) of NO<sub>3</sub> for drinking water.

The level of ammonia that results in “unacceptable” effects on freshwater organisms depends on water temperature and pH. The allowable levels of ammonia in mgL<sup>-1</sup> is as follows:

Temperature (°C)	pH		
	6.5	7.0	7.5
5	51	16	5.1
10	34	11	3.4
15	23	7.3	2.3
20	16	5.1	1.6
25	11	3.6	1.1

**Phosphorus**

No specific standards for freshwater. To prevent eutrophication, phosphates should not exceed .025 mgL<sup>-1</sup> (25 parts per billion) in lakes, .05 mgL<sup>-1</sup> (50 ppb) where streams enter lakes, and .1 mgL<sup>-1</sup> (100 ppb) in streams that do not flow into lakes.

**Temperature**

1. Meets site specific requirements for successful migration, spawning, egg

incubation, and fry rearing for important species.

2. Preserve species diversity and prevent appearance of nuisance species.
3. Not exceed a value more than one-third the difference between optimum and lethal temperatures of sensitive species.

**Dissolved Oxygen**

The most stringent criteria are applied to waters with salmonoid fish populations.

One day minimum of 8.0 mgL<sup>-1</sup> and a 7 day average of 9.5 mgL<sup>-1</sup> of dissolved oxygen in surface water. These criteria are based on the assumption that dissolved oxygen in streambed gravel will be 3.0 mgL<sup>-1</sup> less than in surface water.

**pH**

- 5.0 to 9.0 for domestic water supply
- 6.5 to 9.0 for fresh water aquatic life

**Other Considerations**

No specific standards have been set for bedload or channel characteristics such as channel cross section, pool parameters, or thalweg profile.

**Additional Narrative Water Quality Objectives for California**

Where numerical standards are ambiguous or undetermined, narrative water quality objectives should be taken into consideration. Here are several used in California:

- Inland surface water communities and populations, including vertebrate, invertebrate, and plant species, shall not be degraded as a result of the discharge of wastes.
- The natural taste and odor of fish, shellfish, or other inland surface water resources used for human consumption shall not be impaired.

- Toxic pollutants shall not be discharged at levels that will bioaccumulate in aquatic resources to levels which are harmful to human health.
- The concentration of contaminants in waters which are existing or potential sources of drinking water shall not occur at levels which are harmful to human health.
- The concentrations of toxic pollutants in the water column, sediments, or biota shall not adversely affect beneficial uses.