

Superintendents will work to prevent unacceptable impacts on thermal resources caused by development. Such impacts include the loss of surface thermal features; land subsidence; an increase in seismic activity; the release of noxious gases; noise and surface disturbance from drilling or power plant construction; and the release of polluted water or brines. Because thermal systems may extend well beyond park boundaries, the Service will work closely with tribes and federal, state, local agencies to delineate the full extent of thermal resources and protect those that occur in parks. In protecting park thermal resources, superintendents should consider authorities available under the Geothermal Steam Act of 1970, as amended; state water rights; and mineral leasing laws.

As required by the Geothermal Steam Act, the Service will maintain a list of significant thermal features in park units. The criteria and procedures for designating significant thermal resources in parks are specified in the Geothermal Steam Act Amendments of 1988. In cooperation with the U.S. Geological Survey, the Service will conduct a monitoring program for the designated significant thermal features.

4.8.2.4 Soil Resource Management

The Service will actively seek to understand and preserve the soil resources of parks, and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil or its contamination of other resources. Parks will obtain adequate soil surveys for the management of park resources. All soil surveys will follow National Cooperative Soil Survey Standards. Products will include soil maps, determinations of the physical and chemical characteristics of soils, and the interpretations needed to guide resource management and development decisions.

Management action will be taken by superintendents to prevent or at least minimize adverse, potentially irreversible impacts on soils. Soil conservation and soil amendment practices may be implemented to reduce impacts. Importation of off-site soil or soil amendments may be used to restore damaged sites. Off-site soil normally will be salvaged soil, not soil removed from pristine sites, unless the use of pristine site soil can be achieved without causing any overall ecosystem impairment. Before using any off-site materials, parks must develop a prescription and select the materials that will be needed to restore the physical, chemical, and biological characteristics of original native soils without introducing any exotic species.

When soil excavation is an unavoidable part of an approved facility development project, the Service will minimize soil excavation, erosion, and off-site soil migration during and after the development activity.

When use of a soil fertilizer or other soil amendment is an unavoidable part of restoring a natural landscape or maintaining an altered plant community, the use will be guided by a written prescription. The prescription will

be designed to ensure that such use of soil fertilizer or soil amendment does not unacceptably alter the physical, chemical, or biological characteristics of the soil, biological community, or surface or groundwaters.

(See Evaluating Impacts on Natural Resources 4.1.3; Natural Resource Collections 4.2.3; Floodplains 4.6.4; Wetlands 4.6.5; Facility Planning and Design 9.1.1)

4.9 Soundscape Management

Park natural soundscape resources encompass all the natural sounds that occur in parks, including the physical capacity for transmitting those natural sounds and the interrelationships among park natural sounds of different frequencies and volumes. Natural sounds occur within and beyond the range of sounds that humans can perceive, and they can be transmitted through air, water, or solid materials. The National Park Service will preserve, to the greatest extent possible, the natural soundscapes of parks.

Some natural sounds in the natural soundscape are also part of the biological or other physical resource components of the park. Examples of such natural sounds include

- ◆ sounds produced by birds, frogs, or katydids to define territories or aid in attracting mates
- ◆ sounds produced by bats or porpoises to locate prey or navigate
- ◆ sounds received by mice or deer to detect and avoid predators or other danger
- ◆ sounds produced by physical processes, such as wind in the trees, claps of thunder, or falling water.

The Service will restore to the natural condition wherever possible those park soundscapes that have become degraded by unnatural sounds (noise), and will protect natural soundscapes from unacceptable impacts.

Using appropriate management planning, superintendents will identify what levels and types of unnatural sound constitute acceptable impacts on park natural soundscapes. The frequencies, magnitudes, and durations of acceptable levels of unnatural sound will vary throughout a park, being generally greater in developed areas. In and adjacent to parks, the Service will monitor human activities that generate noise that adversely affects park soundscapes, including noise caused by mechanical or electronic devices. The Service will take action to prevent or minimize all noise that through frequency, magnitude, or duration adversely affects the natural soundscape or other park resources or values, or that exceeds levels that have been identified through monitoring as being acceptable to or appropriate for visitor uses at the sites being monitored.

(See General 4.1; Cultural Soundscape Management 5.3.1.7; Recreational Activities 8.2.2; Use of Motorized Equipment 8.2.3; Overflights and Aviation Uses 8.4. Also see 36 CFR 2.12: Audio Disturbances)