
Chapter 1

Introduction

The water-source toolkit provides tools to evaluate, design, and improve water sources for emergency and long-term resource objectives. The toolkit includes guideline checklists, water-source suitability forms, and drafting options. The toolkit is designed for U.S. Department of Agriculture (USDA) Forest Service interdisciplinary teams to evaluate existing and potential water-source locations on a district or forest.

Background

Water drafting draws water from streams or impoundments to fill trucks or trailers for the purpose of road construction, maintenance, dust abatement, or fire suppression. The type of water-source development varies with location, water availability, drafting equipment, access requirements, and resource objectives.

Types of water sources

- In-channel
- Off-channel
- Tanks (surface or buried)
- Dry-hydrants
- Reservoirs
- Municipal or private water sources
- Springs
- Wells
- Stand pipe

Water sources can adversely impact water quality and other resources if not properly located and designed. Common adverse effects include:

- Erosion and sediment delivery to stream.
- Streambank and streambed modification.
- Equipment leaks and spills.
- Water temperature changes.
- Stream flows reduced.
- Riparian vegetation loss.

Additionally, water sources can directly impact aquatic species through injury from pumping equipment, or by transporting eggs, larvae, and/or adults out of the aquatic system.



Figure 1—Potential for leaks and spills into stream.



Figure 2—Access road drains directly to stream.



Figure 3—Risk of erosion and sediment delivery to stream.

To prevent and reduce adverse impacts, an interdisciplinary team must review existing standards and guidelines, conduct field reviews, and develop water-source facility goals and objectives.

Standards and Guidelines

Guidelines for water drafting and water-source development are located in national, regional and forest-specific references. Prior to selecting a new water source or improving an existing source, review the following references.

Forest Land and Resource Management Plan (FLRMP), including appropriate plan amendments, referencing in particular:

- ✓ Standards and Guidelines and other management direction for water quality, aquatic species, and riparian areas.
- ✓ Aquatic management strategies such as PACFISH and INFISH.
- ✓ Instream flow requirements for the district or forest.
- ✓ Threatened, endangered, or sensitive (TES) aquatic and riparian species.
- ✓ Aquatic nuisance species (ANS) considerations for district or forest.
- ✓ Fire Management Plans (FMPs) for the district or forest.

Standards and Guidelines

- ✓ Timber Sale Administrator (TSA) - Forest Service Handbook 2409.15-2004-2
- ✓ National/Regional Best Management Practices (BMPs) for water-source development consistent with water quality protection (Clean Water Act)
- ✓ Wildland Fire Situation Analysis (WFSA) Forest Service Manual 5100, Chapter 30, Wildland Fire Suppression

Identify regulatory direction from other agencies by consulting the following:

- ✓ National Marine Fisheries Service (NOAA-Fisheries)
- ✓ U.S. Fish and Wildlife Service (U.S. DOI, FWS)
- ✓ State water rights agency
- ✓ State and Federal permitting agencies (EPA, U.S. Army Corps of Engineers)

Forest Land and Resource Management Plan (FLRMP)

The FLRMP provides direction and guidance for water quality, stream buffer widths, aquatic species, riparian areas, TES, and road construction.

Aquatic Management Strategies

Large-scale aquatic management strategies such as PACFISH and INFISH amend the appropriate forest plan and provide direction and guidance on buffer widths, riparian areas, and other areas pertinent to water-source use and development.

Instream Flow Requirements

Stream, pond, and lake level requirements are included in the FLRMP or identified by the State. Determine conditions when flows are inadequate to meet both resource and drafting requirements from drought, time of year, or other resource concerns.

TES Species

Habitat requirements for threatened and endangered species or sensitive species are included in water-source design. Identify recommendations in the biological opinion prior to evaluating new or existing water sources.

Aquatic Nuisance Species

The Nonindigenous Aquatic Nuisance Species Control and Prevention Act of 1990 (P.L. 101-646) highlights the concern for adverse impacts to native aquatic species from nonindigenous species (NAS, Web site). Water drafting operations have the potential to spread ANS through pumps and equipment. Pre-field review of potential ANS within the watershed can identify the risk level. ANS considerations may include disinfecting pumps and identifying disposal areas prior to using drafting equipment. Cleaning of equipment may be colocated with noxious and invasive weed cleaning equipment.

Fire Management Plans

Fire management plans (FMP) are updated annually prior to the fire season. FMPs are developed for a geographic area and may contain information on water drafting locations for different equipment types.

***Timber Sale Administrator
(TSA) Forest Service Handbook
2409.15-2004-2***

The TSA handbook has guidelines for design and use of water sources for timber sale operations. When a water source is needed for a timber sale, planning and design occurs during the environmental analysis. The TSA handbook identifies contract provisions (B 6.5 or B 6.34) for water-source development and use during the timber sale.

Best Management Practices

Best management practices (BMP) represent a set of techniques for preserving or restoring water quality affected by nonpoint pollution. They are the means by which the USDA Forest Service complies with the Clean Water Act. Each individual BMP describes general actions to be taken to preserve or restore water quality. Site-specific prescriptions are implemented at the field level where general BMPs are carried out through specific actions. BMPs are designed to respond to all management actions on National Forest System lands that have the potential to affect water quality including water-source development and drafting. BMPs are developed for each site; and implemented and monitored to ensure water quality objectives are met.

Wildland Fire Situation Analysis

Water drafting from streams may adversely affect aquatic species and habitat especially during spawning. Preidentify drafting and helicopter dipping sites in the Wildland Fire Situation Analysis (WFSA) to reduce impacts to aquatic species. Line officers use WFSA to document the wildland fire suppression strategy decision and can include approved drafting locations in the analysis.

NOAA and FWS

The National Marine Fisheries Service (NOAA-Fisheries) and the U.S. Department of the Interior Fish and Wildlife Service (FWS) provide direction in the form of Biological Opinion Terms and Conditions issued specifically to a forest or district as the result of consultation for federally-listed threatened (T) or endangered (E) species.

Regulatory direction varies with location and species at risk. Water-source specifications may include screen location and orientation, approach velocity, sweeping velocity, minimum screen size, screen-mesh size, shape and material type, and bypass facilities. Other direction may provide information on pumping rates and draw-down of upstream or downstream pools or lakes and ponds where potential impacts to aquatic species may exist (NMFS-NOAA, Web site).

State Water Rights

Each State has direction and guidance for water rights. Easily accessible Web sites provide information on determining instream flow requirements and maximum amount of water withdrawal. Familiarize yourself with the State water rights agency for your area. Consult State databases to identify instream and downstream flow requirements (Waterinfo, Web site).

State and Federal Permits

State and Federal permits may be required if you are constructing a new water source or modifying an existing site. Check with your State to verify if a water quality certification (401) is necessary and if there are additional State or Federal permits needed prior to construction (Clean Water Act, Web site).

Review of the guidelines and recommendations enable the interdisciplinary team to move to the next step and develop area-specific resource objectives.

Chapter 2

How To Evaluate Existing and Potential Water-source Locations

1. Develop a strategic plan for the construction of a limited number of durable long-term water sources.
 - o Enlist interdisciplinary participation.
 - o Define analysis area (watershed or project area).
 - o Define water drafting needs.
2. Establish objectives for type of use desired within the analysis area.
 - o Road maintenance.
 - o Fire emergency (frequency and amount of use).
 - o Access needed (vehicle, helicopter).
 - o Drafting deployment (portable tank, water tender).
3. Collect background information to evaluate site conditions (see appendix A).
 - o Identify locations of existing or potential water sources.
 - o Identify watershed condition (sensitivity/resilience).
 - o Identify presence of TES species.
 - o Identify aquatic nuisance species concerns.
 - o Identify instream flow requirements.
 - o Identify water quality issues.
4. Conduct a field review of existing and potential sites with the interdisciplinary team.
 - o Evaluate sites with the field suitability evaluation form (see appendixes B and C).
5. Select water-source sites and drafting methods that met team objectives.
6. Evaluate the site and treatment against original goals and objectives.
7. Redesign the water source or drafting method if goals and objectives are not met.
8. Implement treatment and monitor to assess short- and long-term effectiveness.