ESPA CAMP Advisory Committee
Technical Work Group

Environmental Factors and Features

May 22, 2008

This document provides a description of environmental factors and features that may be influenced by actions to manage the Eastern Snake Plain Aquifer (ESPA). This list of factors and features is intended to serve three purposes: as general background information and as a checklist of issues to be reviewed as information on the hydrologic effects of ESPA management alternatives becomes available. The description does not attempt to assess or characterize the effects of ESPA actions.

ESPA SPRINGS: DEVIL'S WASHBOWL TO THOUSAND SPRINGS

Feature: Springs, spring creeks, spring water estuaries in the Middle Snake River.

Description:

Fish and Wildlife: Spring-fed creeks and spring water mixing zones or "estuaries" in the Snake River provide high quality habitat for native aquatic species, including redband trout Shoshone sculpin and several rare snail and mollusk species. These spring habitats provide vital refugia for species that once inhabited larger reaches of the Snake River and its tributaries.

Key habitats include: Thousand Springs, Blue Heart Springs, Box Canyon, Niagara Springs, Banbury Springs.

Water Quality: These springs discharge cool and clean water that is critical to maintaining the water quality of the Middle Snake River. *See* water quality description for the Middle Snake River, below.

Recreation and Aesthetics: The springs of the Mid-Snake River are a popular attraction for visitors and sight-seers. Parks that feature springwater creeks include: Malad Gorge, Billingsley Creek, Thousand Springs/Ritter Island, Box Canyon, Pugmire-Niagara Springs, ADD LIST.

The cliffside spring waterfalls visible from Highway 30 between Hagerman and Buhl, known as the Thousand Springs Scenic Byway, are one of the most recognizable scenic features in Idaho.

Issues to Consider:

Changes in spring discharge resulting from aquifer management actions.

Implications of these changes for aquatic habitat, water quality, aesthetics, and recreation.

MIDDLE SNAKE RIVER

Feature: Mainstem Snake River from Milner Dam to King Hill.

Description:

Fish and Wildlife: This reach sustains several cold and warm water fish species, as well as non-game species such as the redband trout and Shoshone sculpin. The Snake River between Shoshone Falls and Brownlee Reservoir also provides habitat for five populations of white sturgeon. Redband trout, Shoshone sculpin and white sturgeon are state-listed sensitive species. Habitat quality in this reach has been affected by altered flow regimes, impoundments, and water quality problems.

Five species of snail that reside in the Middle Snake River are listed as threatened or endangered under the Endangered Species Act: Idaho springsnail, Utah valvata, Snake River physa, Bliss Rapids snail, and Banbury lanx. The Bliss Rapids snail is proposed for delisting due to new information indicating that it is more widespread than known at the time of listing. The lanx resides in three alcove spring complexes at Banbury Springs, Box Canyon and Thousand Springs. The other four species reside in the mainstem of the Snake River between Milner Dam and C.J. Strike Reservoir.

Periodic high flows during the spring play an important role in this river reach. A spring-time peak in the hydrograph is important for successful sturgeon spawning and early development. These high flows are also important to creating and maintaining riparian areas, floodplains, wetlands, and instream habitats for fish and wildlife.

The Snake River from below Milner Dam to the Thousand Springs area often experiences very low flow conditions.

Water quality and flow conditions in the Middle Snake River influence downstream reaches of the Snake River.

Water Quality: Several different segments of the Middle Snake River have been designated water quality limited segments by the State of Idaho. The primary pollutants are nutrients, sediment and increased temperature. The Department of

Environmental Quality has or will develop pollutant budgets known as Total Maximum Daily Loads (TMDL) for this reach for the following pollutants: phosphorus, sedimentation/siltation, fecal coliform, and temperature. Implementation of the TMDL has led to significant efforts and financial investments by fish farms, municipalities, Idaho Power Company, and irrigated agriculture. River flows help the river's ability to assimilate and flush pollutants through the system, improving water quality and the effectiveness of the TMDLs. Flow from springs helps water quality by adding cool, clean water.

Recreation and Aesthetics: Shoshone Falls, at 212 feet high, is a spectacular scenic attraction that draws large numbers of visitors when flows are moderate to high. Other waterfalls and cataracts on this section of river include Cauldron Linn (Star Falls), Pillar Falls, and Auger Falls.

The Middle Snake River also has several popular boating runs, including the Wylie reach below Lower Salmon Falls Dam, the Hagerman reach, and the Murtaugh section.

Issues to Consider:

Changes in the volume and timing of flows reaching the Middle Snake River.

Implications of flow changes for:

White sturgeon reproduction.

Nutrient cycling, aquatic vegetation, and water quality standards.

Winter icing, side-channel habitat, riparian and floodplain habitat

Agricultural return flows to the Middle Snake River

Recreational features, including but not limited to flows over Shoshone Falls and recreational boating.

SNAKE RIVER FROM AMERICAN FALLS RESERVOIR TO MILNER DAM

Feature: River-reservoir system.

Description:

Fish and Wildlife: The river fishery in this reach is dominated by non-native species (rainbow and brown trout) along with native mountain whitefish. The reservoir fisheries are predominated by non-native warm and coldwater game fish. Native species include the Yellowstone cutthroat trout, Paiute sculpin, and

mottled sculpin. The reach between American Falls Dam and Lake Walcott is riverine with a mix of side channels and open flowing water with a pool, riffle, run type structure.

Minidoka National Wildlife Refuge is located in this river reach. The refuge has 21,725 acres including 11,000 surface acres of Lake Walcott. The refuge is provides habitat for up to 100,000 ducks, geese, tundra swans and other waterfowl.

Water Quality: Water quality issues are similar to the Snake River below Milner Dam. TMDL pollutants include: nutrients/eutrophication biological indicators and sediment/siltation. The river below American Falls Dam occasionally experiences very low dissolved oxygen levels

Recreation and Aesthetics: The reservoirs and riverine portions of this area support popular recreational fisheries. Massacre Rocks State Park, Lake Walcott State Park and the Minidoka National Wildlife Refuge are located in this reach of the river.

Issues to Consider:

Changes in river flow and reservoir elevation.

Implications for:

Water quality below American Falls – dissolved oxygen and sediment

Aquatic habitat – side channels, icing, and structure.

Increased entrainment of fish in diversions due to winter operations.

SNAKE RIVER – BLACKFOOT TO AMERICAN FALLS RESERVOIR

Feature: Mainstem river, side channels, islands, riparian cottonwood forest, springs

Description:

Fish and Wildlife: The fishery in this reach is primarily supported by hatchery reared rainbow trout. Wild Yellowstone cutthroat trout and mountain whitefish are also present. Yellowstone cutthroat receive priority management consideration in this and other reaches where they are present. Overwintering habitat appears to be the major factor affecting trout populations in this reach. The Blackfoot reach of the Snake River has in the past experienced very low flow conditions, particularly in the summer.

Portions of this river reach are highly braided, where much of the habitat is located in side channels. These channels are more sensitive to flow changes than the main channel.

This portion of the Snake River, including the Fort Hall Bottoms, supports a significant cottonwood forest. The health of this forest is dependent on periodic high spring flows and inundation. A section of this reach is located partly on the Shoshone-Bannock Tribes' Fort Hall Reservation.

A number of large springs discharge into American Falls Reservoir. These springs sustain wetlands, fish and waterfowl habitat. They also improve local water quality conditions. The volume of these springs depends on aquifer levels.

Water Quality: TMDL pollutants for this reach include sediment/silation for American Falls Reservoir and the Snake River, mile 791 to American Falls.

Recreation: Recreational use consists primarily of sport fishing, waterfowl hunting and boating.

Issues to Consider:

Changes in the volume and timing of flow.

Implications for:

Fisheries habitat, including overwintering and spawning habitat

Winter icing, side-channel habitat, riparian and floodplain habitat

Riparian cottonwood forest

Water quality

Recreation

Fish entrainment from altered operations

SNAKE RIVER ABOVE BLACKFOOT

Feature: Mainstem river, including the Henry's Fork and South Fork Snake River side channels, riparian and floodplain forest.

Description:

These extensive river reaches support some of Idaho's most valued and economically important recreational fisheries – particularly the Henry's Fork and South Fork of the Snake River.

Fish and Wildlife: The South Fork below Palisades Dam supports a significant population of native Yellowstone cutthroat trout as well as rainbow trout, brown trout and mountain whitefish. The Henry's Fork sustains an important rainbow trout fishery with Yellowstone cutthroat trout present as well. The health of these trout populations is influenced by releases from Palisades Dam on the South Fork and Island Park Dam on the Henry's Fork.

The cottonwood gallery forest along the South Fork, lower Henry's Fork and mainstem Snake below the confluence is one Idaho's most significant terrestrial habitats. The South Fork supports 126 different species of birds. The health of this forest is dependent on periodic high spring flows and inundation.

Trumpeter swans use portions of the Henry's Fork for overwintering and are sensitive to river icing during periods of low flow.

Water Quality: Water quality in much of these reaches is excellent. TMDL pollutants in designated segments include sedimentation/siltation and combined bioata/habitat bioassessment.

Recreation and Aesthetics: ADD ECONOMIC DATA FROM LOOMIS STUDY.

The Snake River at Idaho Falls is an important recreational and aesthetic attraction in the heart of the city.

Issues to Consider:

Changes in volume and timing of river flow.

Location of diversions to be used for aquifer recharge operations.

Implications for:

Fisheries habitat

Winter icing, side-channel habitat, riparian and floodplain habitat

Riparian cottonwood forest

Water quality

Recreation and aesthetics

Entrainment of fish during winter operations

OTHER FACTORS AND FEATURES

The foregoing list focuses on river reaches and spring systems that may be influenced by flow changes due to ESPA management actions. Several other factor or features are summarized below may also be affected actions under consideration:

Minidoka National Wildlife Refuge: Expansion of the Minidoka Dam would flood the existing reservoir shoreline, inundating habitat and portions of the national wildlife refuge.

Teton River: Construction of the Teton Dam would impound a currently free-flowing reach of the Teton River, with a range of environmental consequences.

ESPA Water Quality: The implications of aquifer recharge operations on ESPA water quality need to be considered.

Fallowed Land: Consideration needs to be given to the stewardship of any agricultural land that is fallowed to avoid the spread of noxious weeds.

Flow Augmentation for Salmon: The upper Snake River system has contributed water to augment the flow during the migrations of Snake River chinook salmon.

This description of factors and features is not intended to be exhaustive. Addition considerations are likely to emerge as the Technical Work Group examines specific management alternatives in more detail.