

Water Quality Restoration Plan

**West Fork Illinois River Watershed
HUC 1710031104**

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Water Quality Restoration Plan
 Rogue Basin
 Illinois River Sub-basin
 West Fork Illinois River

Bureau of Land Management Managed Lands

West Fork Illinois River at a Glance	
Hydrologic Unit Code	1710031104
Watershed area/ownership	Total: 77,000 acres BLM Ownership: 6000 acres USFS Ownership: 43,500 Private: 27,500
Stream miles assessed	9.6 miles of BLM administered lands
303(d) listed parameters	Temperature
Beneficial Uses	Salmonid rearing, migration and spawning Cold water habitat
Known Impacts(human)	Timber harvest, roads, diversions, development
Natural factors	Soils: Serpentine soils – poor growing conditions and low infiltration
Water Quality limited streams	<i>West Fork Illinois River – mouth to CA border</i> <i>Rough and Ready Creek – Mouth to N- and S-Fork confluence</i> <i>SF Rough and Ready Creek</i> <i>Elk Creek- Mouth to CA border</i>

Statement of Purpose

Water quality standards are established to protect beneficial uses of the State's waters. Beneficial uses are assigned by basin in the Oregon Administrative Rules for water quality. Beneficial uses include:

domestic water supply	fishing
industrial water supply	boating
irrigation	water contact recreation
livestock watering	aesthetic quality
fish and aquatic life	hydropower
wildlife and hunting	commercial navigation and transportation

The Water Quality Restoration Plan for the West Fork Illinois River watershed was prepared to fulfill a requirement of Section 303(d) of the Clean Water Act. It is organized as per part 4 of the Northwest Forest Plan Temperature TMDL Implementation Strategies (USFS, BLM 2004). This plan covers all the Bureau of Land Management lands within the West Fork Illinois River watershed (Figure 1), Hydrologic Unit Code 171003110103.

This WQRP address all listings on the 2004/2006 303(d) list for the plan area. Within the plan area, the West Fork Illinois River, Elk Creek, Rough and Ready Creek, and South Fork Rough and Ready Creek have been placed on the State of Oregon's 303(d) list for failure to meet the water temperature criteria outlined below.

Temperature Standard:

The Oregon water quality temperature below applies to the West Fork Illinois River sub-watershed and is found in OAR 340-041-0028 (4) (a-c) (ODEQ 2005):

(4) Biologically Based Numeric Criteria. Unless superseded by the natural conditions criteria described in section (8) of this rule, or by subsequently adopted site-specific criteria approved by EPA, the temperature criteria for State waters supporting salmonid fishes are as follows:

(a) The seven-day-average maximum temperature of a stream identified as having salmon and steelhead spawning use on subbasin maps and tables set out in OAR 340-041-0101 to OAR 340-041-0340: Tables 101B, and 121B, and Figures 130B, 151B, 160B, 170B, 220B, 230B, 271B, 286B, 300B, 310B, 320B, and 340B, may not exceed 13.0 degrees Celsius (55.4 degrees Fahrenheit) at the times indicated on these maps and tables;

(b) The seven-day-average maximum temperature of a stream identified as having core cold water habitat use on subbasin maps set out in OAR 340-041-101 to OAR 340-041-340: Figures 130A, 151A, 160A, 170A, 220A, 230A, 271A, 286A, 300A, 310A, 320A, and 340A, may not exceed 16.0 degrees Celsius (60.8 degrees Fahrenheit);

(c) The seven-day-average maximum temperature of a stream identified as having salmon and trout rearing and migration use on subbasin maps set out at OAR 340-041-0101 to OAR 340-041-0340: Figures 130A, 151A, 160A, 170A, 220A, 230A, 271A, 286A, 300A, 310A, 320A, and 340A, may not exceed 18.0 degrees Celsius (64.4 degrees Fahrenheit);

Element 1: Condition Assessment and Problem Description

The Oregon Department of Environmental Quality (ODEQ) gathers and assesses water quality data for streams in Oregon and maintains a list of streams (the 303(d) list) that do not meet water quality standards. These streams are considered water quality limited, meaning that beneficial uses of the stream are adversely affected by water quality conditions. The West Fork Illinois River has four stream segments listed on the 2004/2006 303(d) list. Table 1 displays the stream, water quality parameter not meeting standards, and beneficial use effected.

Table 1. West Fork Illinois River 303(d) listed streams

Stream Segment	Miles of Stream	Parameter	Beneficial Use
West Fork Illinois River: Mouth to California Border	17	Water Temperature	1, 2, 3, 4
Elk Creek: Mouth to CA border	3.9	Water Temperature	5, 6
Rough and Ready Creek: Mouth to North/South Fork Confluence	6.1	Water Temperature	5, 6
South Fork Rough and Ready	6.3	Water Temperature	5, 6

1. Salmon rearing and migration - mouth to Whiskey Creek Confluence
2. Core cold water habitat – Whiskey Creek to CA border
3. Spawning: Oct 15-May 15th mouth to Whiskey Creek
4. Spawning: Oct 15-June 15th Whiskey Creek to CA border
5. Salmon rearing and migration
6. Spawning: Oct 15-May 15th

The WFIR is a 78,000 acre watershed containing five subwatersheds including Elk Creek, lower facing drainages, middle facing drainages, Rough and Ready

Creek, and Whiskey Creek. There are no key watersheds in the West Fork Illinois River Watershed.

There are two geologic formations leading to two distinct soil types in the watershed. These are separated by a northeast trending fault which divides the watershed into the western and eastern areas. The western area of the watershed is dominated by serpentine soils which contain high levels of magnesium, iron, nickel, chromium, and cobalt. Due to the high ratio of magnesium to calcium, soil productivity is low and vegetation sparse. Serpentine soils are typically shallow; water holding capacity is low. In contrast, the eastern area comprised of Pollard-Abegg and Josephine-Pollard soils are deep and well drained.

The WFIR is a rain dominated hydrologic system. The Mediterranean climate produces a precipitation pattern of 58 inches in the northeast to 130 inches in the far west with the vast majority of precipitation falling between December and March. Accordingly, peak flows occur during the winter months. Due to the dominance of serpentine soils, streamflows in the western area of the watershed are particularly flashy, rapidly rising and falling with the onset and cessation of rainfall. Eastern area soils are typically deeper and have a greater vegetative cover than the western area. As a result streamflows are not as responsive to precipitation.

Moderate peak flows (2 to 5 year flood return interval) result from intense winter rainstorms. Peak flows of record such as the 1964 and 1974 flood events result from rain on snow events. Flood events create widespread bank erosion and channel adjustment in the lower gradient floodplain reaches. While bank erosion is a natural occurrence, riparian vegetation removal and channel straightening to the floodplain areas of the WFIR and Elk Creek, has greatly reduced the function of the floodplain to dissipate flood energy. Consequently, channel banks are the primary energy dissipater, resulting in accelerated bank erosion. Bank erosion has lead to channel widening, which increases water surface area. Associated with a greater water surface area is an increase in solar radiation input into the stream, leading to increased water temperatures.

As with peak flows, baseflow differs between the eastern and western areas of the watershed. With shallower soils in the western area the ability to store water decreases, resulting in lower summer flows. Within the areas of serpentine soil, seeps and springs surface along bedrock planes. While the seeps and springs do not contribute to baseflows, they provide important sources of water for unique fen wetlands. Surface flows in the western area are also reduced by large cobble deposits at the mouths of tributaries. Rough and Ready and Rock Creeks are notable examples. In these instances, water flows subsurface below the cobble deposits. Baseflows are generally higher in the eastern area due to greater water holding capacity in the upslope area and the absence of coarse soil deposits.

Primary activities affecting water quality in the WFIR are riparian vegetation removal, residential and agricultural development, channel widening, and water withdraws (ODEQ 2002, USDA Forest Service 1997). Riparian harvest, agricultural development, and residential housing along riparian areas have created a mosaic pattern of vegetation. As a result, some of the riparian trees are not tall enough to shade the streams adequately. Water flowing through such areas are exposed to increased solar radiation, leading to elevated temperatures.

According to the Illinois River shade assessment (ODEQ 2002), riparian vegetation on BLM managed lands is at or near stream shade potential. Table 2 displays existing and potential shade for streams running through BLM managed lands. Serpentine soils, known as low productivity soils, along the West Fork Illinois River and Rough and Ready Creek are responsible for the low existing and potential shade as well as the lengthy recovery time. Years to recovery denotes length of time required to reach potential shade.

Many riparian stands, both at and below shade potential, are overstocked due to past activities and fire suppression. These stands exhibit lower growth rates, reduced stand resiliency, and higher fire risk. The Grants Pass Resources Area actively investigates riparian conditions to identify riparian stands which would benefit from thinning or underburning. Benefits include increased growth rates, stand complexity, as well as reduced fire danger.

Consumptive water uses in the Illinois River Valley have greatly reduced baseflows. According to the Oregon Department of Water Resources, no water is available for future water rights claims. In other words, surface waters in the West Fork Illinois River are fully appropriated. As a result of the low flow conditions, the WFIR was listed as water quality limited due to flow modification. Subsequently, in 2002, the flow modification parameter was dropped from the 303 (d) list, as reduced flows were not considered a pollutant. Exacerbating the effects of surface water diversions on baseflows are groundwater withdraws. While not quantified, numerous wells in the watershed pump groundwater for domestic, landscaping, and irrigation use. Often water withdrawn from wells is hydrologically connected to the surface water. In these instances, ground water is removed that would have discharged into streams. Streams with reduced flows are more susceptible to increases in stream temperatures.

Table 2. Watersheds and BLM Managed Lands for Water Quality Limited Streams in the WFIR.

West Fork Illinois	% of river managed by BLM	Existing Shade	Potential Shade	Percent Improved Shade	Years to recovery
West Fork Mainstem	22	51	69	18	90
Elk Creek	10	98	98	0	
SF Rough and Ready	8	17	25	8	120
Wood Creek	8	96	97	1	Recovered*

* Recovery is considered reached at 80% or greater shade value.

Element 2: Goals and Objectives

For the West Fork Illinois River Watershed, the primary goal within riparian reserves is the maintenance and long-term restoration of riparian ecosystems as identified in the Northwest Forest Plan Aquatic Conservation Strategy (ACS) objectives. Specific project goals include:

- 1) Manage riparian areas within one to two tree-heights of all streams to benefit riparian health and aquatic habitat. Management includes preserving current conditions (protective) and silvicultural treatments to increase stand vigor and resiliency (proactive).
- 2) Manage BLM administered riparian lands to reach their shade potential.
- 3) Maintain/improve riparian reserve health on BLM managed lands to maximize large wood recruitment into the channel and riparian environments. The instream wood will benefit downstream channel stability and improve aquatic habitat conditions. Maintenance of late-seral conditions where they currently exist. In early, mid-seral, and mature stands that lack structural complexity, treatments would accelerate stand development into late-successional/mature structure (i.e. large trees, snags, down wood, species diversity and hardwood retention).
- 4) Return stand density and fuel loads to range of natural variability to reduce potential for stand replacement events.

To accomplish, the Northwest Forest Plan (NWFP)(USDA, USDI 1994) and the Medford District Resource Management Plan (RMP)(USDI 1995) provides management guidance to maintain or improve riparian health. The most relevant direction in the NWFP is included in the Aquatic Conservation Strategy (ACS) objectives; the ACS was developed to restore and maintain the ecological health

of watersheds and to protect salmon and steelhead habitat on lands within the range of Pacific Ocean anadromy. The ACS contains specific water quality objectives that protect the beneficial uses identified in the state's water quality standards. Riparian reserves, key watersheds, watershed analysis, and watershed restoration components of the ACS are designed to operate together to maintain and restore the productivity and resiliency of riparian and aquatic ecosystems. In addition to the ACS, the Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl, April 1994, describe land allocations and specific standards and guidelines (S & Gs) for managing these land allocations. These S & Gs effectively serve as Best Management Practices (BMP's) to prevent or reduce water pollution further contributing to goals of Clean Water Act compliance.

Element 3: Proposed Management Measures

Management and protection of riparian zones will occur at two levels — programmatic and project. The Medford RMP contain BMPs that are important for preventing and controlling to the “maximum extent practicable” non-point source pollution and achieving Oregon water quality standards.

The Northwest Forest Plan standards and guidelines will be used to meet the goals of the West Fork Illinois River Water Quality Restoration Plan including:

- Stream Temperature – Shade Component
Aquatic Conservation Strategy: B9 – B11, C30
Riparian Vegetation: B31
Riparian Reserves: B12 to B17
Watershed Restoration: B30
- Stream Temperature – Channel Form
Aquatic Conservation Strategy: B9 – B11, C30
Riparian Vegetation: B31
Riparian Reserves: B12 to B17,
Watershed Restoration: B30
Roads: B19, B31 to B33

Programmatic: The riparian reserve width for the fish-bearing streams in the WFIR Watershed ranges between 300 and 330 feet on each side of the stream. For non-fish bearing streams the riparian reserves will range between 150 and 165 feet on each side. The range in riparian reserve widths is a function of potential tree heights of vegetation types found along the riparian corridors.

Project: The second level of management and protection occurs at the project planning level. The project planning level includes the landscape management units, usually fifth field watershed scale. A team of specialists including fish biologists, hydrologists, botanists and silviculturalists examine watershed analysis conclusions and conduct field surveys to determine the most appropriate actions necessary to improve and/or maintain riparian health and protection.

These actions typically include developing silvicultural prescriptions to improve stand vigor, decommissioning roads, planting, and designing site specific BMPs.

The *Sufficiency Analysis for Stream Temperatures* (USDA Forest Service, USDI BLM 2004) provides specific guidance for silvicultural practices within riparian reserves. Shade curves were computed based on stream width, orientation, and topography factors and show the required minimum no-cut buffers necessary to maintain and restore site-potential riparian shade. The shade curves and field surveys will ensure maintenance of riparian stands providing primary shade (those stands which provide shade between the hours of 10am and 2pm).

The West Fork Illinois River landscape project team, incorporating recommendations in the WFIR watershed analysis (USFS 1997) and guidelines included in the sufficiency analysis, identified 135 acres of thinning and 628 acres of fuel reduction treatment in the riparian zones. Table 3 lists the 6th field subwatersheds and associated acres of thinning and fuel reduction. Silvicultural treatments in the riparian reserve can be described as thinning from below treatments, with the intention of leaving the larger/healthier trees in the overstory. Additionally, the project would improve and/or renovate 25 miles of existing road to current BLM standards for minimal hydrologic disturbance.

A total of 628 acres would be burned in the riparian reserve. There would be 439 acres of wildlife habitat treatments, 229 acres of slash treatment, and 12 acres of young stand fuel reduction. Specific design features, or BMPs, applied to the proposed treatments include:

- Vegetation providing primary shade would be retained; silvicultural treatments would not occur within 25 feet of intermittent streams or within 50 feet of perennial streams and fish-bearing streams.
- Silvicultural treatments in the riparian reserve can be described as thinning from below treatments, with the intention of leaving the larger/healthier trees in the overstory. Silvicultural treatments in riparian reserves would not reduce the canopy coverage below 50% with the overall long term target of greater than or equal to 60%. Vegetation primarily responsible for providing shade to the active channel would be retained. The stocking level would provide adequate future recruitment of Large Wood Debris (LWD) to exceed the desired >25 key pieces per mile.
- Under burning for wildlife habitat enhancement would occur within 25 and 50 feet of intermittent and perennial streams in the Jeffery Pine and White Oak Plant series. Approximately 20-30 percent of ground vegetation would remain, creating a mosaic burn. All trees would remain.
- Other prescribed fuel treatments including, thinning, burning (with the exception of a backing burn) and brushing would not occur within the designated "no treatment" area, 25 ft and 50 ft for intermittent and

perennial channels, respectively. Hand piles will not be burned within 25' of a stream channel or in the bottom of a dry draw.

Table 3. Acres of Thinning and Fuel Treatments

6 th Field Subwatersheds	Acres of Thinning	Acres of Fuel Reduction
Elk Creek	37	328
Lower WF Illinois R.	42	108
Middle WF Illinois R.	56	268
Upper WF Illinois R.	0	136

Element 4: Timeline for Implementation

The major provisions of this plan have already been implemented. The NWFP was implemented with the signing of the Record of Decision(ROD), April 13, 1994. Inherent in the implementation is the passive restoration of riparian areas that ensued as a result of the riparian reserve buffers/allocation. Implementation of active restoration activities beyond the inherent passive riparian restoration occurs with watershed analyses and site-specific projects.

Implementing specific activities designed to improve riparian conditions requires analysis under the National Environmental Policy Act and will occur following the landscape level planning. In 2003, the Grants Pass Resource Area developed the West Fork Illinois landscape planning project. The plan identified road improvements, riparian silvicultural prescriptions outside the primary shade zone, and fuel reduction activities, leading to improved stand resiliency and productivity. The timing for active restoration implementation of these activities is dependent on funding levels and the NEPA process.

Stream temperature recovery is largely dependent on vegetation recovery. Actions implemented now will not begin to show returns in terms of reduced stream temperatures or improved aquatic habitat for a number of years. Due to the mixed ownership in the WFIR watershed, water temperature decreases will be dependent on non-BLM land management actions.

By using the shade curves adopted from the SHADOW (USDA Forest Service, 1993) model and the projected height growth of riparian vegetation, a prediction of shade recovery over time can be made. Table 2 displays existing riparian shade, potential shade, and the time it will take to reach potential conditions on BLM administered lands. The long recovery period for small increases in shade is attributed to poor soil conditions.

Element 5: Identification of Responsible Participants

The BLM signed a Memoranda of Agreement (MOA) with ODEQ that provides a framework for effective cooperation on programs and projects to pursue the shared goal of attainment of state water quality standards. To that end, the MOA includes provisions for implementation that satisfy State and Federal point and non-point source pollution control requirements, develops a common understanding of water quality protection and restoration, and constitutes the basis for continuing formal designation of the BLM and USFS as Designated Management Agencies.

The Director of ODEQ, the BLM State Director, and the USFS Regional Forester are responsible for ensuring implementation of the agencies MOAs. The ODEQ Water Quality Administrator, the BLM Deputy State Director for Resource Planning, Use, and Protection, and their designees are responsible for implementing the details of the agency's MOAs. Abbie Josse, Grants Pass Resource Area Manager, and Bill Meyers, DEQ Rogue Basin Water Quality Coordinator, are the local parties responsible for development and oversight of the completed Water Quality Restoration Plan(WQRP) and associated TMDL.

Element 6: Reasonable Assurance of Implementation

The ROD and associated Medford District Resource Management Plan were approved by the Oregon/Washington State Director on April 14, 1995. The ROD approves the BLM's decisions for managing 870,000 acres in portions of Josephine, Jackson, Douglas, Curry, and Coos counties.

Implementation and monitoring of the ACS and use of the Sufficiency Analysis logic and tools provide reasonable assurance that watersheds under the direction of the NWFP will move towards attainment of water quality standards and beneficial use support. Implementation and adoption of the MOAs also provide assurances that water quality protection and restoration on lands administered by the FS and BLM will progress. Additionally, adherence to BMP's developed through the NEPA process and project design guidelines instituted for T&E species protection further provides reasonable assurance of progress toward water quality improvement. However, BLM acknowledges that periodic review of the Sufficiency Analysis and TMDLs is necessary to provide the assurance that goals and objectives are being met.

Element 7: Monitoring and Evaluation

Monitoring will be used to ensure that decisions and priorities conveyed by BLM plans are being implemented and to document effectiveness of management actions. If monitoring indicates that sufficient progress toward the goals contained in this plan are not being made, the goals and activities will be revisited and changes made as necessary to the action plan to assure attainment of water quality standards.

The primary objective of this WQRP is to reach vegetation shade potential on BLM managed lands leading to attainment of the state water temperature standard. Due to the mixed ownership in the West Fork Illinois, attainment of the water temperatures standard requires multi-ownership participation and commitment to improve riparian function. Therefore, the monitoring plan focuses on evaluating vegetation response to stand treatments.

The BLM will award a contract to complete the vegetation treatments identified in this WQRP plan and the West Fork Illinois River environmental assessment. The BLM will monitor and assess the implementation of the project to ensure consistency with planned activities. Further, stand plots have been established in many units planned for treatment, setting a baseline condition. The interdisciplinary team can revisit the established plots as necessary to evaluate vegetation response. Monitoring would include tree canopy cover, growth rates, and species diversity.

Additionally, at a programmatic level, researchers at the Forest Service Pacific Northwest Experiment station are assessing the effectiveness of the management actions directed by the NWFP to improve water quality. Specifically, this effort monitors the effectiveness of the ACS strategy in protecting or enhancing aquatic habitat, inclusive of water quality.

Element 8. Public Involvement

Many of the elements contained in this WQRP derived from existing land use planning documents such as the Medford RMP and the NWFP. These documents received broad based public comment during scoping prior to development of alternatives and during public appeal of both documents. Both documents also received numerous responses to the Draft Environmental Impact Statement that were published for review, prior to development of the Final Environmental Impact Statements and Record of Decisions.

The Oregon Department of Environmental Quality has lead responsibility for creating (TMDLs) and (WQMP) to address water quality impaired streams in Oregon. This Water Quality Restoration Plan will be provided to DEQ for incorporation into an overall WQMP for the Illinois River Watershed. DEQ has a comprehensive public involvement strategy, which includes informational sessions, mailings, and public hearings.

Additionally, the NEPA process requires public involvement prior to land management actions, providing another opportunity for public involvement. During this process, BLM sends scoping letters and schedules meetings with the public. The public comment period ensures that public participation is incorporated into the decision making process.

Element 9. Maintenance of Effort Over Time

The conditions leading to water quality limitations and 303(d) listing have accumulated over many decades. Management measures to address these factors will be carried out over an extended period of time. Furthermore, once restorative actions and protection practices achieve desired results, continued vigilance will be required to maintain water quality standards.

Northwest Forest Plan and Federal Land Management Plans

The NWFP, and the Medford Resource Management Plan are ongoing federal land management plans. The NWFP became effective in 1994. The RMP was implemented in 1995 and covers a period of approximately 10 years or until the next RMP revision. Federal law requires RMP and Forest Plan implementation.

Water Quality Restoration Plan

The Medford District BLM, working in partnership with the DEQ, is responsible for ensuring the WQRP is implemented, reviewed, and amended as needed. This includes the following:

1. Review of the responsible agencies implantations, verifying consistency with plans.
2. Promotion of ongoing communication, financial support, and partnerships for implementing priority projects.
3. Continue efforts to explore revised or additional management measures based on results of monitoring activities and other sources of information.
4. As additional information becomes available and techniques are improved, continue to improve and revise cost/benefit estimates.

Element 10. Costs and Funding

Active restoration can be quite costly, depending on the level of restoration. The following are average costs of typical restoration activities (implementation only, does not include planning costs):

Riparian thinning	\$4,000 per acre
Culvert Replacement	\$80,000-110,000 each

There are several sources of funding for restoration activities. This includes revenue generating activities (such as timber sales), congressionally appropriated budget line items for restoration, and grants.

Revenue Generating Activities

Traditionally, the main revenue generating activity has been timber sales.

Budget Line Items for Restoration

In 2003, the BLM Medford District's restoration budget (Jobs in the Woods) was \$800,000. Generally, line item funding is directed to key

watersheds, threatened and endangered (T&E) species, 303(d) listed streams, and for projects with completed NEPA. West Fork Illinois River is not a key watershed but contains T&E species and 303(d) listed streams. Additionally, the state office of the BLM offers monies through the Clean Water and Watershed Restoration program.

Grants

Federal and state programs such as the Oregon DEQ 319 Non Point Source (NPS) Water Quality program and the Oregon Watershed Enhancement Board (OWEB) provide funds for watershed restoration activities. The BLM has been working with the local Illinois River Basin Watershed Council to forge partnerships to complete restoration projects on a cooperative basis.

Every attempt will be made to secure funding for restoration activities but it must be recognized that the federal agencies have political and economic realities. Federal activities are subject to public and legal review prior to implementation; legal clearance is necessary prior to implementation. Historically, budget line items for restoration are a fraction of the total requirement. Grants may prove to be an increasingly important mechanism for funding restoration but funds are subject to availability, eligibility and approval of external parties.

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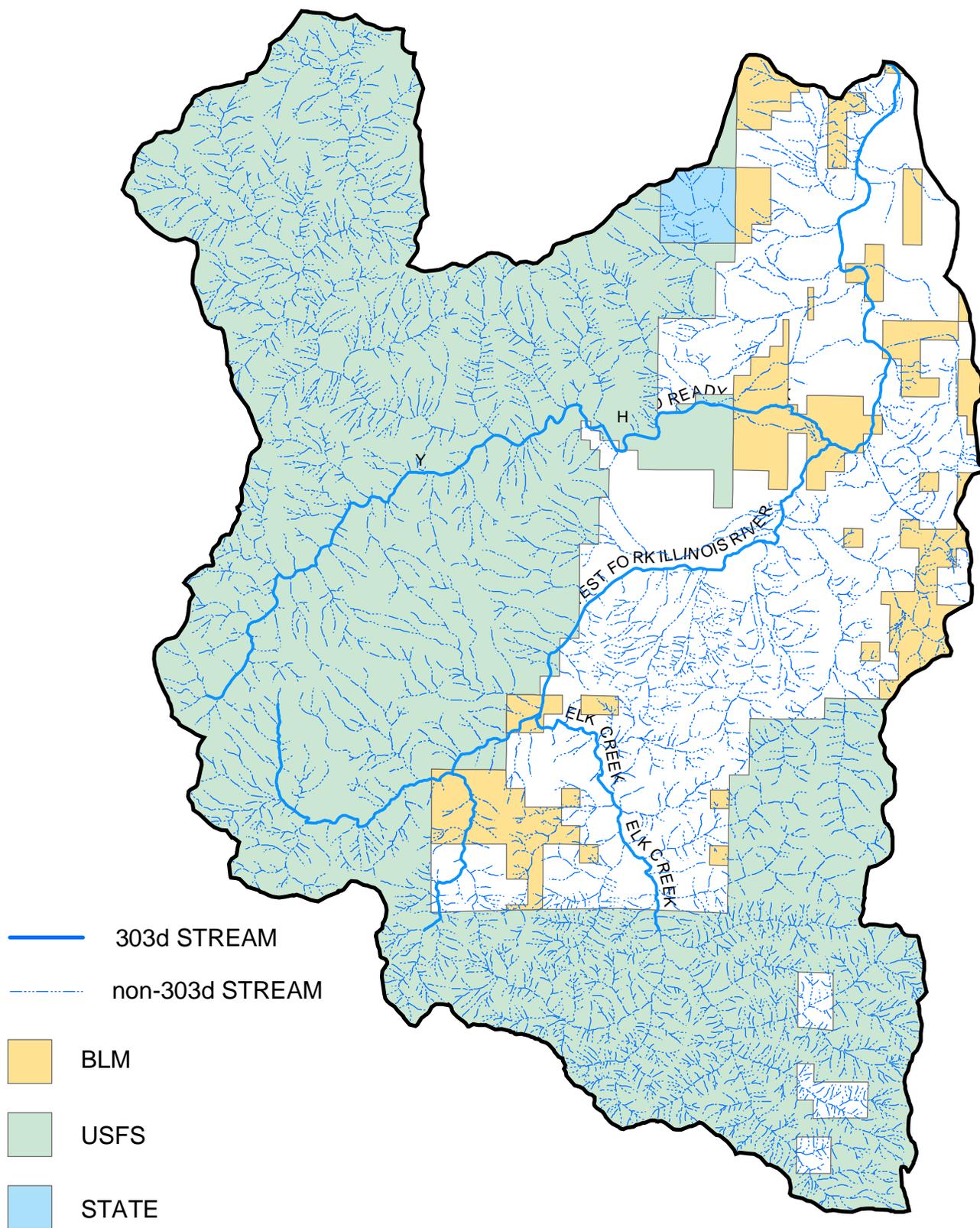
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Figure 1 - 303d Streams in the W. Fk. Illinois River Watershed



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