

Water Quality Restoration Plan

**Illinois-Kerby sub-Watershed
HUC 171003110106**

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Water Quality Restoration Plan
 Rogue Basin
 Illinois River Sub-basin
 Illinois-Kerby Sub-watershed

Bureau of Land Management Managed Lands

Illinois-Kerby Sub-watershed	
Hydrologic Unit Code	171003110106
Watershed area/ownership	Total: 18,770 acres BLM Ownership: 6,427 acres USFS Ownership: 2,083 Private: 9,356
303(d) listed parameters	Temperature
Beneficial Uses	Spawning; Salmonid rearing and Anadromous passage
Known Impacts(human)	Water diversions, bank erosion, riparian harvest
Natural factors	Wide valley bottom stream, serpentine soils
Water Quality limited streams	<i>Illinois River Mile (RM) 0-56; Free and Easy Creek RM 0-2.1</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 (WQRP) for the Illinois-Kerby sub-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 Total Maximum Daily Load (TMDL) Implementation Strategies (USFS, BLM 2004). This plan covers all the Bureau of Land Management lands within the Illinois-Kerby 6th field watershed (Figure 1), Hydrologic Unit Code 171003110106.

This WQRP address all listings on the 2004/2006 303(d) list for the plan area. Within the plan area, the Illinois River and Free and Easy 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 standard that applies to the Illinois-Kerby sub-watershed was approved by EPA on March 2, 2004 and is found in OAR 340-041-0028 (4) (a-c) (ODEQ 2005). Excerpts of the 2004 standard read as follows:

(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 Unless superseded by the natural conditions criteria described in section (8) of this rule, or by subsequently adopted site-specific criteria approved by EPA, the temperature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 Illinois-Kerby watershed has two stream segments listed on the 2004/2006 303(d) list. Table 1 displays the stream, stream miles and water quality parameter not meeting standards.

Table 1. Illinois-Kerby sub-watershed 303(d) listed streams

Stream Segment	Miles of Listed Stream	Miles on BLM	Parameter	Beneficial Use
Illinois River	5	0.2	Water Temperature	1, 2
Free and Easy Creek	2.1	1.2	Water Temperature	3

1. Spawning: Oct 15-May 15th
2. Salmon rearing and migration
3. Rearing and Migration

The Illinois-Kerby sub-watershed is an 18,770 acre watershed. Illinois River water temperature monitoring by DEQ at RM 32 found 7-day maximum temperatures greater than 13 °C for 13 days between 10/15-11/2. DEQ summer temperature monitoring at RM 48 found 7-day maximum temperatures of greater than 18°C for 50 days. In Free and Easy creek water temperatures were reported above 22°C.

A reduction of both baseflow and riparian vegetation in the mid- and lower reaches of tributary streams (Holton, Free and Easy) and mainstem Illinois River are primarily responsible for increased water temperatures. Reduced volumes of water are more susceptible to warming and reduced vegetative cover increases solar radiation input.

Base flow

The State of Oregon's Water master's Office recorded over one hundred points of diversion from tributary streams and the Illinois River in the Kerby sub-Watershed. All streams are over appropriated for water rights (USDI 1995). There are two major irrigation ditch systems, one on each side of the valley, that supply water for crops. While not quantified hundreds of private wells pull groundwater for domestic and irrigation uses; groundwater extraction exacerbates low flow conditions. The watershed also supplies water for communities and domestic beneficial uses. With the very heavy private demands on water, summer flow conditions have greatly decreased.

Upstream, in the Upper Illinois watershed, there were 698 CFS in water rights for industrial, mining, and agricultural uses in the Upper Illinois River (USDI, USDA 2000). Approximately 5,300 acres of agricultural land, predominantly pasture grass and hay, irrigates with the East Fork Illinois River water.

Free and Easy Creek is an intermittent stream that flows into an irrigation ditch running on the west side of the Illinois River. Other tributary streams, due to diversions and natural low flow, contribute little to no flow to the Illinois River during the late summer season. Therefore, tributary water input does not increase Illinois River water temperatures. However, the lack of tributary input reduces flow in the Illinois River, increasing susceptibility to elevated water temperatures.

Riparian Condition

Floodplains in the lower gradient valley bottoms of Holton, Free and Easy, Reeves Creeks and the Illinois River have been cleared for agriculture production and mining, resulting in a early seral vegetation along the stream channel.

This riparian zone along the Illinois River was much larger historically than it is currently, as is indicated by the undisturbed area in T. 39 S., R. 8 W., Section 17. In this section there are several sloughs, ponds, and small areas that are filled by flooding or subsurface flows from the river. In the adjacent agricultural land these wetlands have been cleared of vegetation and reclaimed for agriculture (USDI 1995). The Illinois River flows through approximately 0.2 miles of BLM managed lands. Shade values along this stretch are uncertain but the stand is in mid-seral condition (11-21 inches in diameter). Given the wide valley bottom and small percentage of BLM lands on one side of the river, shade values are below 20%. Future shade is expected to continue to be low along the Illinois River due to agriculture and wide channel widths.

In the moderate to high gradient reaches, rotational harvest on private lands and past BLM forest practices has reduced distribution of mature riparian forest stands. In many riparian zones, fire suppression in combination with past harvest activities have led to high density, slow growing riparian stand conditions.

On BLM managed lands over the last 11 years management activities in the riparian zone focused on the protection of riparian functions of instream wood recruitment, stream shade and wildlife corridors. The recovery of past riparian harvest units with a management emphasis to maintain or improve riparian zones has led to an improving trend in riparian and aquatic conditions.

Shade values along tributary streams in the project area were not included in the riparian shade assessment for the Illinois (ODEQ 2002) as tributaries represent less than 5% of the watershed area. The small tributary area combined with diversions and ditches that capture tributary flow, the Illinois River receives no input from streams in the project area. BLM riparian shade values on the listed Free and Easy stream are greater than 80%, based on field inspection. Channel widths are 15 feet and riparian areas are stocked with poles and mid-seral vegetation. For thermal protection of cold water beneficial uses, the Oregon Department of Environmental Quality considers full recovery of shade at 80% (USFS, USDI 2004).

Many riparian stands 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. While there is little to no opportunity to decrease stream water temperatures given the small amount of BLM lands along perennial streams and flows are interrupted downstream on private lands, riparian treatments would improve riparian conditions through increased growth rates, stand complexity, instream wood recruitment and reduced fire danger.

Channel Condition

Currently, channel conditions rate in poor condition as indicated by high levels of bank erosion and high pool to riffle ratios. Prevalent bank erosion indicates that energy moving through the system has increased or the ability to dissipate the energy has decreased. The mainstem of the Illinois River have been appreciably altered by roads, agriculture and housing development (USDI 2000).

Streams and riparian areas in the sub-watershed is described in the Kerby Watershed Analysis (USDI 1995) as degraded due to the effects of historic and current land use. The Oregon Department of Fish and Wildlife (ODFW) has identified fish habitat benchmarks used to determine if a component of fish habitat is a limiting factor in trout or salmon production or survival. In the streams of the project area, large woody debris (LWD), pool depth and frequency, water flow and temperature have been identified as limiting for salmon and trout production and survival. The ODFW benchmark for pool habitat is that pools comprise >35% of total stream area, adequate riparian canopy is identified as coverage >75%, and >20 pieces of large wood per 100 meters of stream.

Fine sediment embeddedness was recorded in 17% of stream reaches on BLM managed lands in the Illinois-Kerby subwatershed. While historic distribution of fine sediment is not known, current conditions likely represent an increase due to past harvest practices, mining and road building. Importantly, given the reduction of upslope and riparian harvest, larger culverts, road closures and decommissioning, and vegetation recovery on skid roads, fine sediment loading from BLM lands is decreasing.

Peak flow increases have been linked to channel instability, as greater flow volume yields greater energy. Further, USGS gauging statistics on the Illinois River do not display an increase in peak flow. Selected roads, via interception of surface and groundwater, have increased flow routing to the stream network. Given the scale of roaded acres (2% of the watershed area), the road network is creating isolated effects to runoff and sedimentation but not landscape scale changes resulting in increased peak flow magnitude.

Element 2: Goals and Objectives

For the Illinois-Kerby sub-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.

Programmatic: The Northwest Forest Plan standards and guidelines will be used to meet the goals of the Illinois-Kerby 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

The riparian reserve width for the fish-bearing streams in the Illinois-Kerby sub-Watershed is 330 feet on each side of the stream. For non-fish bearing streams, the riparian reserves is 165 feet on each side.

Project: The second level of management and protection occurs at the project planning level. The project planning level includes the Tennessee Lime landscape management unit, which follows the Illinois-Kerby sub-watershed boundary. 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, USDI 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 landscape project team, incorporating recommendations in the Kerby watershed analysis (USDI 1995) and guidelines included in the sufficiency analysis, identified 259 acres of thinning, and 750 acres of fuel reduction treatment in the riparian zones. 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. To improve hydrologic function and sediment reduction, 39 miles of existing road would be improved to current BLM standards, including culvert upgrades and .65 miles of decommissioning. One-quarter mile of road would be constructed.

Specific design features, or BMPs, applied to the proposed treatments include:

- Vegetation providing primary shade would be retained; no management activities would 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%-60% with the expectation that in ten years canopy cover would increase to 60%-70%. Vegetation 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.
- Prescribed fuel treatments including, thinning, burning, and brushing would not occur within 50 ft for both intermittent and perennial channels. All trees greater than 8" DBH would be retained.

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 2006, the Grants Pass Resource Area developed the Tennessee Lime 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 Illinois-Kerby watershed, water temperature decreases will be dependent on non-BLM land management actions.

With passive restoration (riparian buffers) leading to improvement of past riparian harvest units combined with active riparian management to improve health, resiliency and growth rates, riparian functioning is expected to increase. Improvement of riparian shade leading to decreases in water temperature is not expected given the very limited BLM lands that lie adjacent to perennial streams and the dominant influence of private land condition on water temperature.

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.

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 (~5 years) of TMDLs is necessary to provide the assurance that goals and objectives are being met.

Element 7: Monitoring and Evaluation

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 Kerby watershed, 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 environmental assessment. The BLM will monitor and assess the implementation of the contract 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	\$50,000 -80,000

There are several sources of funding for restoration activities. This includes congressionally appropriated budget line items for restoration, and grants.

Budget Line Items for Restoration

The state office of the BLM offers monies through the Clean Water and Watershed Restoration program. 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. The Illinois-Kerby sub-watershed is not a key watershed but contains T&E species and 303(d) listed streams.

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 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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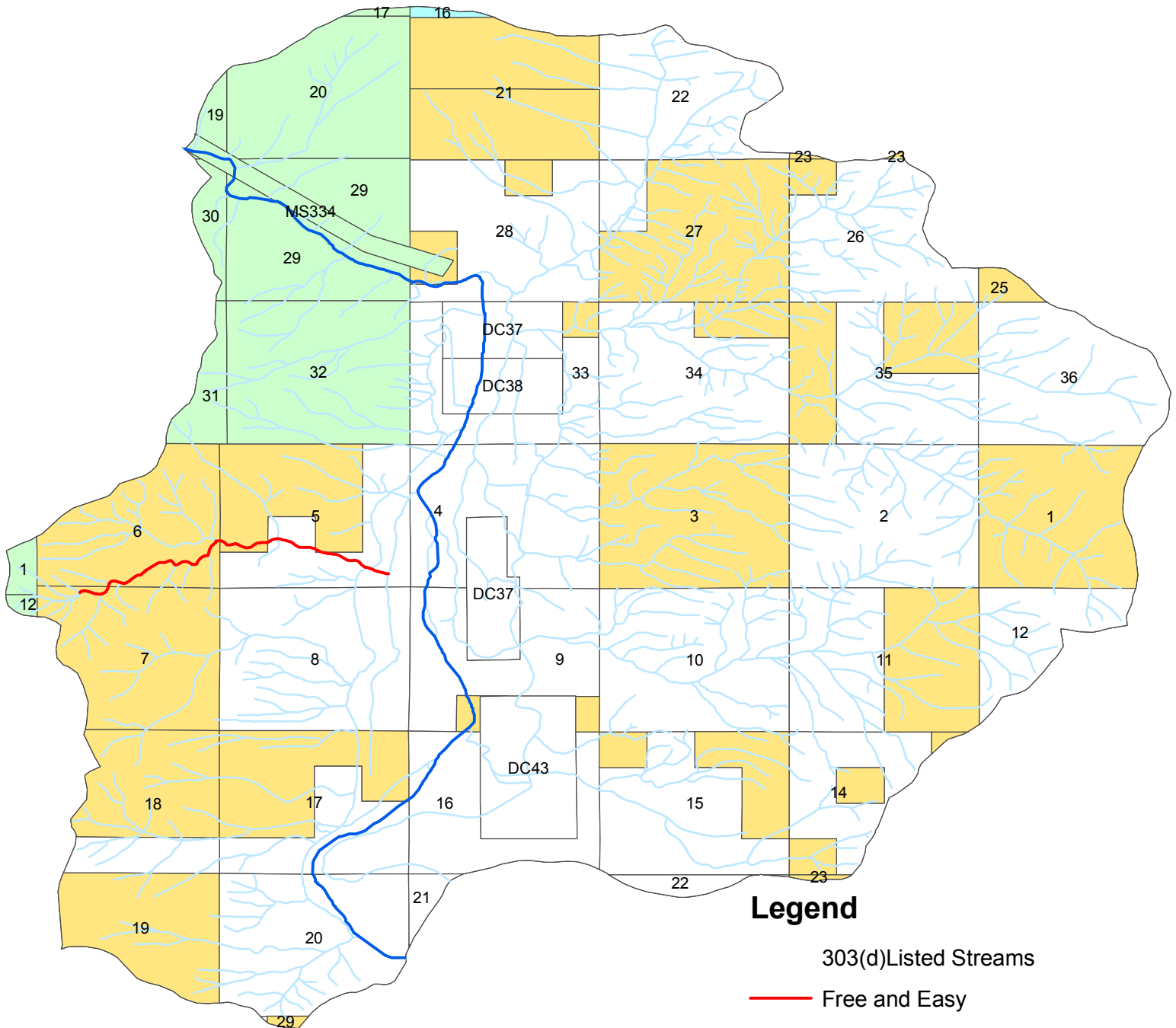
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Kerby Sub-Watershed and 303(d) Listed Streams



Legend

303(d) Listed Streams

- Free and Easy
- Illinois River
- Bureau of Land Management
- Forest Service
- Private
- State Forestry
- Sub-Watershed Boundary