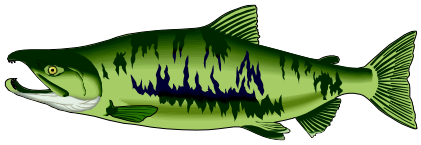
CHETCO RIVER WATERSHED

ACTION PLAN



Prepared for

The Chetco River Watershed Council

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TABLE OF CONTENTS

ABSTRACT

The *Chetco River Watershed Action Plan* was prepared for the Chetco River Watershed Council whose members are dedicated to sustaining the health of their watershed. This document utilizes detailed information about the Chetco River watershed from the *Chetco River Watershed Assessment* which followed guidelines described in the *Governor's Watershed Enhancement Board's 1999 Draft Oregon Watershed Assessment Manual*. Funding was provided by the Oregon Watershed Enhancement Board, Oregon Department of Environmental Quality, United States Bureau of Land Management, Oregon Department of Agriculture, Curry County Soil and Water Conservation District and Oregon State University Extension Service.

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CHETCO RIVER WATERSHED ASSESSMENT SUMMARY

The following is an abbreviated summary of a much larger, in-depth watershed assessment available from the South Coast Watershed Office.

INTRODUCTION

The Chetco River, located almost entirely within Curry County, drains approximately 352 square miles or 225,000 acres. The Chetco is the largest coastal watershed (excluding the Rogue River) in Oregon south of the Coquille. The Chetco mainstem is about 56 miles long with its headwaters and the first 28 miles of the mainstem located within the Kalmiopsis Wilderness. Flowing in a westerly direction the Chetco empties into the Pacific Ocean at Chetco Cove located about 6 miles north of the California line between the towns of Brookings and Harbor. Elevations in the watershed range from sea level to approximately 5,098 feet on Pearsoll Peak. Major tributaries include Box Canyon Creek, Tincup Creek, Boulder Creek, Mislatnah Creek, Eagle Creek, South Fork, Emily Creek, North Fork and Jacks Creek. The upper portion of the watershed is characterized by steeply sloped forested areas with narrow valleys and tributary streams that have moderately steep to very steep gradients. The lowest 11 miles of the river is bordered by private land. Rural residential development, forestry, and urban areas are the dominant land uses in this lower portion of the watershed. The Chetco estuary, estimated at 1.7 miles in length has been substantially altered from its natural state.

History

Most Curry County watersheds have received varying impacts from Euro-American populations during the past 150 years (1850 – 2000). The general landscape pattern for Curry streams and rivers is: timber in the uplands (on public & private industrial timberlands) flowing down onto broader floodplains in the lowlands, where agriculture and some rural residential use predominates. The Chetco River saw heavy mining activity for gold and other minerals in the upper watershed in the early 1900's – and extensive logging of private and public timberlands lower in the drainage in the 1950's and 60's. The mouth and estuary of the river were changed dramatically by the installation of the jetties in the 1960's by the U. S. Army Corps of Engineers. The only recorded railroad in Curry County was constructed along Jacks Creek to help transport logs during the heyday of logging in the watershed, when there were 15 active lumber mills in the Brookings area.

Watershed Issues

The Chetco River Watershed Council identified the following issues of concern related to land use: lack of large wood in the channel; undersized and plugged culverts; rural residential development; timber harvest; channel changes (location of thalwag, Jacks Creek, pool quality, and harbor siltation); road construction; and water quality.

Ecoregions

The Chetco watershed contains four different ecoregions. The Southern Oregon Coastal Mountains make up 11 percent of the watershed, with steep to very steep gradients, high rates of erosion, and high stream densities. Rainfall averages 79-140" per year. High winds, landslides and fires are expected natural disturbances.

The Coastal Siskiyous make up 73 percent of the watershed, with habitat very similar to Southern Oregon Coastal Mountains. The Redwood Zone is a very small portion (less than 1%) of the south end of the watershed, and represents a typically northern California ecoregion.

The Serpentine Siskiyous ecoregion covers 15 percent of the watershed. Sparse vegetation, steep terrain, high natural erosion rates and rainfall averaging 45-140" characterized this area.

Channel Habitat Types

Only the lower five subwatersheds were assessed for channel habitat types. Of the 140 miles assessed, 10.3 miles were classified as highly responsive LM - low gradient/moderate confinement, and MM - moderate gradient/moderate confinement channel types. LM channels are mostly in the North Fork Chetco, Lower Chetco Mainstem and the Chetco Coastal Area. MM channels are predominantly in the Lower Chetco and North Fork Chetco subwatersheds.

Twenty-two miles of low gradient confined channels were assessed, with ten miles in the North Fork, 6.5 miles in the Middle Chetco, and 2.7 miles in the Chetco Coastal Area. LC channel types are frequently degraded flood plain channels, but can be channels confined by hillslopes or bedrock walls as well. Field checks are needed.

Fish and Fish Habitat Assessment

1995 stream habitat surveys of Bosley Creek, Bravo Creek and its tributary, the North Fork Chetco and Ransom Creek indicate mostly high shade for the surveyed reaches and typically low bank erosion. Riparian conifers are sparse and amounts of large wood in the surveyed reaches are less than desirable. Pool habitat is typically simple, with shallow residual pool depths. Width-to-depth ratios are less than desirable and spawning gravel is of good quality, though limited.

Fish distribution is very widespread, with chinook mostly in the lower half of the watershed, and the lower end of major tributaries. Jacks Creek is an important coho salmon stream. See the maps included in the fish assessment component for more detail on distribution. Hatchery fish are an issue in the Chetco watershed, though they are Chetco watershed stock raised at Elk River hatchery.

Thirteen barriers were identified; 5 adult barriers, 4 adult restricted, 1 uncertain adult restricted, 1 juvenile barrier and three uncertain juvenile barriers.

Water Quality Assessment

The Chetco River is moderately impaired for phosphates and has a 303(d) listing on Chetco mainstem for temperature (mouth to Box Canyon). Bravo Creek and the North Fork Chetco are also listed for temperature from the mouth to the headwaters. Many other stream reaches are being investigated for temperature, flow modification and sedimentation concerns.

Water temperatures are "very warm to hot". Mainstem temperature maximums are in the low to mid 70's, with Boulder Creek, Eagle Creek, Emily Creek, and Bosley Creek max temperatures in the mid 60's. All tributaries are cooler than the mainstem. Significant heating occurs in the upper mainstem, above the wilderness boundary. The water in the estuary is anoxic (without oxygen) and very poor quality at certain times of the year.

Riparian (Shade) Assessment

Only the private and BLM sections of the watershed were assessed for shade. The vegetation typing has been completed, but is not fully analyzed. The analysis of Jacks Creek was done with "pre-golf course" aerial photographs.

The greatest potential increase in shade for first order streams is in the upper North Fork. A 12 percent potential increase exists in second and third order streams in the Chetco Coastal Area. The mainstem North Fork shows the highest potential increase (25%) for a fifth order stream.

Mature and high reproduction forest areas, important for large wood recruitment and shade, are concentrated along Upper Jacks Creek, Mill Creek, Upper Panther Creek, the west slope of Bravo, and the west slope of the upper North Fork Chetco, above Bravo.

Wetland Characterization and Functional Assessment

Approximately 93 acres of wetlands were assessed in the Chetco River watershed. This acreage was accounted for 25 wetlands. Nineteen percent of the wetlands assessed had high potential for restoration and/or protection. Seventy-three percent had low to no potential for restoration. Almost three-quarters of all wetlands are located in the Coastal Area, and rural residential development surrounds nearly half of the existing wetlands. Ninety-two percent of the wetlands assessed are connected to another water body. All wetland assessment was completed using aerial photos and field visits are needed for verification.

Hydrologic Condition Assessment

This assessment is based on runoff estimates for various landuses and soil cover conditions. Peak flow enhancement (increased stream power) is an increase in the strongest, and potentially most destructive, part of the flood curve.

Urban roads in the Chetco Coastal Area create a high risk of peak flow enhancement (increased stream power). Seven subwatersheds show a greater than 25 percent area in the transient snow zone, but risk of peak flow enhancement (PFE) though timber harvest and rain-on-snow interaction is unknown. Agricultural land use risk to PFE is moderate to low in the four subwatersheds where is applicable. Risk of PFE due to forest roads is low in all subwatersheds. Risk of PFE due to rural roads is high in the Middle Chetco Mainstem and moderate in Jacks Creek, Lower Chetco Mainstem, and the North Fork Chetco.

All of the roads rankings need to be re-assessed to incorporate revised road data. Road drainage and ditched/drained wetlands (flow alteration) are not addressed in this assessment.

Water Use

A majority of the water rights in the Chetco watershed are junior to the 1964 in-stream right. The in-stream right is usually met. The Chetco Lower Mainstem from June to October represents the best opportunities to restore stream flows with conservation measures, increased efficiency, and best management practices.

Sediment

The assessment of sediment processes in the Chetco River focuses on the density of roads built on slopes greater than 50 percent, and the density of stream/road crossings. Lower density rankings are assumed to have less potential for contributing sediment than high. These rankings are relative to all South Coast subwatersheds.

The Chetco Coastal Area is ranked moderate for density of roads on steep slopes, five subwatersheds ranked moderate to low, and Quail Prairie and Upper Chetco Mainstem were not ranked due to lack of data. Density of road crossings are low in Quail Prairie Creek, moderate in North Fork Chetco and Eagle Creek, moderate-high in Jacks Creek Upper Mainstem and Lower Mainstem Chetco, and high in Chetco Coastal Area and the Middle Chetco Mainstem.

CHETCO RIVER WATERSHED SYNTHESIS

The Chetco River watershed is dominated by the Coastal Siskiyous ecoregion, with some Serpentine Siskiyous, Southern Oregon Coastal Mountains, and a very small portion of Redwood Zone. The watershed has mostly high erosion, high runoff soil types both in the upper and lower portions of the watershed. In the upper watershed, rapid runoff and exposed serpentine in the inner gorge strongly influence water quality and hydrology in the Chetco River. More than eighty percent of the watershed is publicly owned.

Water temperatures increase dramatically through portions of the wilderness area and are not cooled completely by the cooler main tributaries. Mining is still active in the watershed both for gravel in the lower sections and minerals in the upper. Jetties have greatly altered the mouth of the river and how it functions as habitat for salmon migrating to the ocean.

High density of roads on steep slopes in the Coastal Area is a concern, as is the density of road crossings in all of the mostly private subwatersheds (lower five), and the private sections in the mostly Forest Service subwatersheds (Eagle Creek and Upper Chetco-1). The amount of urban and rural development in the lower watershed is a large concern for fish habitat in the future. As the urban and rural populations grow, so do the risks of peak flow enhancement, sediment inputs, riparian vegetation removal and water contamination.

Hydrology in the watershed is greatly affected by the high percentage of low infiltration soils, especially those in high altitudes with the potential for snowfall. Risk of peak flow enhancement (or increased stream power - PFE) is rated moderate due to rural roads in Jacks Creek, Lower Chetco (1), and the North Fork, and high in the Middle Chetco Mainstem. Risk of PFE is high in the Chetco Coastal Area due to urban roads. Risk of PFE is moderate to low in the four sub-watersheds with agricultural/residential areas.

The Chetco watershed has over 10 miles of highly responsive/sensitive channels that are fairly evenly distributed. Jacks Creek and the North Fork have an abundance of channels that are sensitive to disturbance and can migrate. Channels in the upper watershed are mostly confined by hillslopes or other features and are subject to "flashy" streamflows.

Steelhead and cutthroat trout use the entire watershed. Chinook use is mostly in the lower mainstem channels (below Mislatnah), and coho extend slightly higher in distribution. Historically, coho populations were probably quite low, being on the southern end of their range.

A riparian assessment revealed pockets of large wood recruitment areas, and large potential increases in shade. The highest potential shade increases occur in two areas; along nearly five miles on the lower reaches of the North Fork (5^{th} order streams) and along nearly five miles of smaller streams (2^{nd} and 3^{rd} order) in the Chetco Coastal Area. Channel widening was documented on the North Fork, The South Fork, and Emily Creek, with increases in width recorded from 50 to 200 feet. Channel widening and canopies opening indicate sediment problems and channel instability in response to floods of 1955 and 1964. Channels are narrowing as they re-vegetate and recover.

Most of the 25 wetlands (93 acres) identified are within the Chetco Coastal Area, with some in the North Fork, Jacks Creek, and the Lower Chetco Mainstem.

Water use in the Chetco rarely exceeds the in-stream water right of 1964. Nearly three-quarters of the out-of-stream rights are junior to in-stream water rights. The largest percentage of use is municipal, where conservation measures could be very effective in restoring higher in-stream flows.

Water quality rated low in the Chetco, not only from high temperatures but also sedimentation, phosphate levels, dissolved oxygen and pH.

Limiting factors to fish production and water quality in the Chetco appear to be water temperature (reduced shade, especially in tributaries), sediment transport and storage, number of roads, and estuary habitat.

CHETCO SUBWATERSHED SUMMARIES

Chetco Coastal Area

This subwatershed is contained within the Southern Oregon Coastal Mountains and a small area of the Coastal Siskiyous, with high gradient streams and high landslide occurrences. Land use is mostly forestry (57%) and urban (39%). Channel habitat types are mostly low gradient confined and moderate valley confined with approximately a mile and a half in highly responsive/sensitive reaches. Several barriers to fish migration are recorded. Coho and Chinook salmon use the mainstem of the Chetco. Steelhead use the mainstem and tributaries.

Water quality is poor in this subwatershed, with anoxic conditions in the harbor, very high temperatures in the river, high phosphate levels, and high amounts of algal growth in certain seasons. The Chetco River is listed as water quality limited for temperatures and is being investigated for sedimentation.

Eighteen of 25 wetlands identified in the Chetco Watershed are located in this subwatershed. They have a wide variety of conditions with the largest covering an area of eight acres. Several wetlands are in good functioning condition and could be investigated for protection.

This subwatershed is rated as low risk for peak flow enhancement (increased stream power) due to forest roads and timber harvest. It is rated as high risk for the number of urban roads. The City of Brookings is the largest water user in the watershed, with 85 percent of all water rights junior to the 1964 in-stream right.

For sediment concerns, this subwatershed ranked moderate density for roads on steep slopes when compared to all South Coast subwatersheds, and ranked density for road crossings. Gravel extraction and estuary modifications are a concern for fish habitat and water quality.

Jacks Creek

The Jacks Creek subwatershed is also contained within the Southern Oregon Coastal Mountains, with a small percentage in the Redwood zone. The portion within the Redwood zone has more moderate gradients both in hillslopes and stream channels. Land use is identified as mostly forestry (77%), and agricultural/rural residential (23%). The Salmon Run Golf Course is in this subwatershed. Two wetlands are identified here, and both are associated with the golf course.

Channel habitat types are mostly hillslope-confined, with only 1.2 miles in low gradient confined. 2.6 miles are active floodplain channels, and nearly a mile is contained in a moderately confined category.

Two barriers are identified for juvenile migration, one certain and one uncertain. Jacks Creek is very important habitat for coho salmon with its low gradients and position low in the watershed. Chinook and steelhead use the stream, also. Jacks Creek does have a

source of large wood, for maintaining/creating fish habitat, in the upper portion of the watershed.

Risk of peak flow enhancement (increased stream power) is ranked as low for timber harvest and forest roads, moderate for range/agricultural use, and moderate for risk due to rural roads. The County Watermaster and ODFW rate Jacks Creek as a streamflow restoration priority area. Stream flow is over-allocated during the low flow months.

For sediment concerns, Jacks Creek is rated as low to moderate for the density of roads on steep slopes when compared to all South Coast subwatersheds, and moderate to high for density of stream/road crossings.

North Fork Chetco

The North Fork Chetco is contained within the Coastal Siskiyous ecoregion as well as the Southern Oregon Coastal Mountains. Ninety-four percent of the land is in forestry use, with 6 percent in agriculture/range/rural use. Conditions are wet and mild with steep gradients, weak rock and high natural erosion rates. This subwatershed displays the "inner gorge" feature, which greatly impacts land use, sediment supply, and potential vegetation. Forty-four miles of channel are confined by hillslopes, 17 miles of moderate and low gradient confined channels, 3 miles of moderately confined channels, and 5 miles of floodplain, alluvial and estuary channels. Two wetlands are identified in this subwatershed; both are in agricultural use.

One culvert is identified as restrictive to adult passage on a tributary to the North Fork. Coho and Chinook salmon use the lower half of the watershed. Steelhead use most of the mainstem as well as the tributaries. The upper North Fork contains a potential supply of large wood for fish habitat and stream function.

Stream shade is lacking in the upper and lower portions of the North Fork (1^{st}, 4^{th}, and 5^{th} order reaches). The upper North Fork has low stream temperatures, and the lower North Fork has very high stream temperatures. The North Fork is 303(d) listed for temperature and is being investigated for sedimentation and flow modification. Stream flows are over-allocated in the low flow months.

The North Fork rated low risk for peak flow enhancement (increased stream power) due to timber harvest and forest roads, and rated moderate risk for agricultural use and rural roads. An active sediment source is present in the upper North Fork, with potential impacts on fish habitat and water quality. The North Fork ranked low to moderate density for roads on steep slopes when compared to all South Coast subwatersheds, and ranked moderate density for stream crossings.

Lower Chetco Mainstem (1)

The Lower Chetco Mainstem is mostly contained within the Southern Oregon Coastal Mountains, with a portion in the Coastal Siskiyous and a very small portion in the Redwood zone. Land use is mostly forestry (78%) and agricultural/rural residential (21%). Channel habitat types are mostly confined by hillslopes (6 miles), with four miles

moderately confined and 1.4 miles low gradient confined. Three small wetlands are identified, and all are in agricultural use.

Coho, chinook and steelhead use this subwatershed, coho and chinook mostly on the mainstem, steelhead on the mainstem and tributaries. Three barriers to fish migration are identified. The mainstem has very little existing shade, and some potential for improvement. Mill Creek contains a source of large wood for potential recruitment into the stream channel. Water quality is limited in this subwatershed, with a 303(d) listing for temperature and investigation for sedimentation, flow modification and habitat modification. Water is over-allocated in low flow months.

Risk for peak flow enhancement (increased stream power) is rated low for timber harvest and forest roads, and moderate for agricultural use and rural roads. A portion of impervious soils exists in the upper portion of this subwatershed. For sediment concerns, the Lower Chetco Mainstem is ranked as low to moderate density for roads on steep slopes relative to all South Coast subwatersheds, and moderate to high density for stream crossings.

Middle Chetco Mainstem
The Middle Chetco Mainstem is contained within the Coastal Siskiyous ecoregion, as well as a portion of the Southern Oregon Coastal Mountains. Ninety-eight percent of the land is in forestry use. Channel habitat types are mostly confined by hillslopes (29 miles), low gradient confined (6.5 miles), and very short portions in moderate or unconfined types (less than a half mile - combined). No wetlands are identified.

Coho, chinook and steelhead use this subwatershed. Two barriers to adult fish migration are noted. Mature/high reproduction forests in Panther Creek are a potential source of large wood for the system. The mainstem Chetco in this area has a modest potential for shade improvement.

Stream temperatures are very high, with 303(d) listing for temperature and investigation on sedimentation, flow modification and habitat modification. Stream flow is over-allocated during low flow periods. Risk of peak flow enhancement (increased stream power) is low for timber harvest and forest roads, and high for rural roads.

Present and future sediment sources are a concern in the Middle Chetco. The east side of the valley has high sediment production potential, and in sediment analysis the whole subwatershed ranked high density for stream crossings when compared to all South Coast subwatersheds. Density of roads on steep slopes ranked low.

Emily Creek, South Fork Chetco, Quail Prairie Creek, Upper Chetco (1) and (2), Eagle Creek, Mislatnah Creek, Granite and Carter Area, Tincup Creek, Lower Chetco Mainstem (2), Boulder Creek and Box Canyon.
These subwatersheds are mostly managed, or exclusively managed by the US Forest Service. Seven of the twelve are contained within the Kalmiopsis Wilderness Area. Ecoregions are a mix of Coastal Siskiyous and Serpentine Siskiyous, with a very small

amount of Southern Oregon Coastal Mountains. Steelhead use all of the twelve subwatersheds, coho use seven of the twelve, and chinook use six of the twelve. Check the distribution maps in the watershed assessment for more detailed locations. Water quality is limited on the mainstem Chetco for its entire length, and 303(d) listed for the entire reach below Box Canyon Creek. Over-allocation of water is identified in Quail Prairie Creek. Sediment assessment was conducted only on the limited private portions of Eagle Creek, Quail Prairie, and the Upper Chetco (1). Six of the twelve subwatersheds have high amounts of area with low infiltration soils. These areas have very high natural runoff rates and can impact both channel morphology and fish habitat.

ACTION ITEMS

This list is a product of a synthesis process by natural resource specialists with extensive experience on the South Coast, who reviewed and discussed the watershed assessment for the Chetco River. Input from watershed councils is also incorporated. Actions are focused on addressing limiting factors and are listed in order of relative importance, based on the impressions of the resource specialists. For a more complete list of restoration, protection, outreach and assessment activities, refer to the Curry Action Plan. All action items are voluntary, with complete respect for private property rights.

1. **Encourage citizen involvement for outreach and education in water quality and riparian vegetation issues on private sections of the mainstem (especially Wilderness Retreat subdivision).**
   Work with landowners and residents on protecting riparian vegetation for shade and large wood.

   Work with landowners and residents on protecting water quality from non-point source and point source pollution.

   Work with landowners to investigate locations of wells and springs for water quality and quantity concerns.

2. **Riparian Silviculture on high shade potential areas.**
   Plant riparian vegetation for shade and large wood values, where appropriate and with proper protection.

   Encourage natural conifer regeneration where possible.

   Convert alder-dominated stands to conifer, where appropriate.

3. **Restore connectivity in estuary.**

4. **Develop and implement water quality monitoring plans for private lands, especially in the estuary.**

Institute water quality measurements in addition to temperature, to identify limiting factors and provide feedback on restoration efforts.

5. **Education/Outreach for water conservation (especially domestic).**
   Work with landowners and city residents on water conservation issues.

6. **Road surveys on all private lands.**
   Where possible, assess all roads and crossings for suitability, design, and risk of failure on private lands.

7. **Wetland restoration and protection.**
   Field check all wetlands listed in the Wetland Assessment and assess for functionality.

   Where possible, protect intact wetlands.

   Where possible, restore function, connection to a water body and potential vegetation in less than intact wetlands.

8. **Continue information exchange with golf course regarding watershed health and fish habitat issues.**

9. **Focus restoration efforts on the North Fork.**
   Identify and initiate any and all restoration opportunities for the North Fork, especially with shade and wood.

10. **Protect or restore high response stream channels.**
    Assess highly responsive/sensitive stream reaches. Where possible, protect where intact, stabilize if at risk.

11. **Address data gap for bedload.**
    Determine sediment sources and transport reaches.

    Identify stability of in-channel storage.

12. **Address barriers to fish migration.**