Analysis Methods and Consideration of Available Science

This report has been developed for the North Paradox Allotment categorical exclusion to evaluate the project's compliance with the Manti-La Sal Forest Plan soil and aquatic ecosystem direction, standards and guidelines, potential effects upon floodplains, wetlands and municipal supply watersheds, and compliance with the Clean Water Act. The best practicable science was used in the hydrological assessment of this project. The relevant science considered for this analysis consists of several key elements:

- On-site reconnaissance of key areas. Key areas include streams and wetlands within the project area selected based on aerial photograph interpretation as well as GIS layers.
- Scientific literature (discussed within the specialist report).
- GIS information on soils, streams and wetlands.
- Integration of the professional knowledge on the part of the Hydrologist with the collective knowledge of the project area by ID Team members. This includes a review of range allotment historical files.
- Comparative analysis considering other local similar projects. The effects to the watershed from other similar projects in the area have been considered in the analysis (see 'Consideration of Cumulative Effects' section below).

Rationale in Support of C. E. and Consistency with Regulatory Framework

Forest Plan Standards

Applicable Forest Plan Direction for Soil and Water (USDA Forest Service 1986, p. III-4) includes the following: maintain satisfactory watershed conditions; provide favorable conditions of water flow (quality, quantity and timing); protect soil and water productivity so that neither will be significantly or permanently impaired; and protect and enhance riparian areas including dependent resources.

Watershed, Riparian and Stream Conditions

The North Paradox Allotment is located on the east side of the La Sal Mountains, mostly within the state of Colorado although a small portion is in Utah. The Roc Creek Terrace and East and West Carpenter Pastures are roughly within the sixth level Roc Creek Watershed and the Paradox and Dry Point Pastures are within the sixth level Willow Basin Creek Watershed. Both of these streams are tributary to the Dolores River system.

Roc Creek forms the northwest boundary of the allotment and, because of topographic barriers; livestock rarely access Roc Creek directly. Intermittent drainages tributary to Roc Creek as well as wetlands, springs and constructed impoundments located on the bench above Roc Creek are utilized by livestock during the course of their rotation. In August of this year, wetlands and springs in the Roc Creek Terrace pasture were assessed using Properly Functioning Condition protocols by the District Wildlife Biologist, Range Conservationist and Hydrologist. Four springs and associated wetlands were assessed and results indicated that three sites were properly functioning. One site was rated functioning at risk with an upward trend due to a partially healed headcut caused by a road crossing. Most of these wetlands were formed by hillside seeps

draining into depressions. Development of springs and wetlands for livestock use began to occur in the 1920s with the aim of improving livestock distribution. Development entailed either the excavation of the original wetland into a reservoir or the development of springs whereby flows were collected and funneled into a trough. These developments have affected wetland quality and extent by concentrating livestock use and leading to utilization of vegetation and site trample as well as through physical alteration of the site.

Riparian areas along Buckeye Creek upstream from the reservoir and around Buckeye Reservoir in the Buckeye Pasture are also utilized by livestock mostly after Labor Day weekend to avoid conflicts with recreation. Historically, cattle 'congregated on Buckeye Park and this area was soon denuded' (Owen Despain, USFS 1946). In the spring of 1938, additional fencing was added and the area was seeded to help alleviate this problem. I visited this area on 8/2005 as part of field work for the Buckeye Fuels/Thinning Project. The perennial Buckeye Creek is a 'C3' type channel (Rosgen, 1996) above the reservoir. This channel type is described as moderately sensitive to disturbance and very dependent on vegetation for streambank stability. The wetlands fringing the reservoir range from very narrow in width (~10 feet) where side slopes are steeper, to 100-200 feet wide in lower lying areas adjoining the reservoir that are regularly inundated during the spring. Roads and trails frequently cut though the wetlands or are within 50 feet of the highwater line especially on the north and southeast side. There is a small wetland (~200 sq. ft) in the vicinity of the spring providing water for the Buckeye Guard Station. Buckeye Reservoir is a popular recreation destination with numerous dispersed campsites present around the periphery that are especially dense on the north and southeast sides of the reservoir. Associated with the campsites are numerous off-road vehicle trails/roads leading through the nearby woods and across wetlands bordering the reservoir. The forest has provided at least three toilets located at various points around the reservoir to improve sanitation. Timber harvest took place about 10 years ago throughout some of the analysis area. Localized areas of soil compaction were noted in old landings and the faint outline of skid trails was present. The Buckeye Fuels/Thinning project (Categorical Exclusion completed in 2006) proposes to treat a total of 780 acres within a 2500 acre in the Buckeye Reservoir area using the following methods: commercially thin ponderosa pine (larger then 8 inch DBH) across 380-530 acres and thin pre-commercial size ponderosa (less then 8 inch DBH) across an additional 130 acres. Acres of commercially thinned ponderosa pine stands would also be thinned of pre-commercial ponderosa and layering shrubs. Prescribed fire would be applied to 650 acres, including the commercially and precommercially thinned units. Mostly existing roads would be used, but eight additional short stretches of temporary road (0.2 miles) would be constructed for unit access. Approximately 40 log landings would be constructed for the ground based harvest system. This project is expected to be implemented beginning in 2007.

West Paradox Creek can be accessed by livestock in a few locations from the Dry Point Pasture. This pasture is generally used first or last in the rotation because it is low elevation and lacks good water sources. The Lion Creek Fire was started by a rollover car accident on the Paradox Road on June 20th 2006. When the fire was contained on June 26th, 1499 acres of mostly Pinion- Juniper were burned. Of these acres 327 acres were burned at low intensity, 92 acres at moderate intensity and 1080 acres were burned at high intensity. A quarter mile section of West Paradox Creek was burned over at a moderate to high intensity level including the side slopes and riparian area. The stream is a steep, bouldery step pool (Rosgen classification A2) and is not dependent upon vegetation for streambank stability. On Monday July 10th at approximately 1pm a convective event precipitated between one to two inches over two hours, with localized bursts as great as two to three inches, in the vicinity of the Lion Creek Fire burned area (personal communication Brian Avery, NWS Hydrologist). West Paradox

Creek responded rapidly to this event with flooding of a magnitude not seen before by local residents (Clinton Oliver, Paul Redd). It appears that the burned area probably exacerbated the flooding by rapidly sheeting water, ash and sediment into West Paradox Creek. It is possible that debris jams also may have magnified the flooding and that burned material may have contributed to this process. An existing range seeding in the Dry Point Pasture was mostly burned over reducing the overall forage in this pasture.

Based on ID reconnaissance, the riparian areas in the allotment meet *Forest Plan* Direction and Standards. Riparian vegetation, where present, is adequate in both composition and density to provide for soil protection. Vegetation proper-use criteria are generally met.

Floodplains, Wetlands and Municipal Water Supply

The project's potential effect upon the following extraordinary circumstances, floodplains (Executive Order 11988), wetlands (Executive Order 11990) and municipal supply watersheds (Safe Drinking Water Act) is evaluated below.

Floodplains

The objectives of Executive Order 11988, Floodplain Management, are

- to reduce the risk of flood loss and minimize the impact of floods on human safety, health and welfare;
- to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative; and
- to restore and preserve the natural and beneficial values served by floodplains.

Specifically, each federal agency is to provide leadership and take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

Although there are not floodplains in the classic sense, the floodprone area, in some cases, could take in the entire valley bottom. Given this, livestock use of the floodprone areas does occur, however the activity would not result in occupation or modification of the floodplains. Floodplains are present in the project area, but no significant adverse effects are anticipated with implementation.

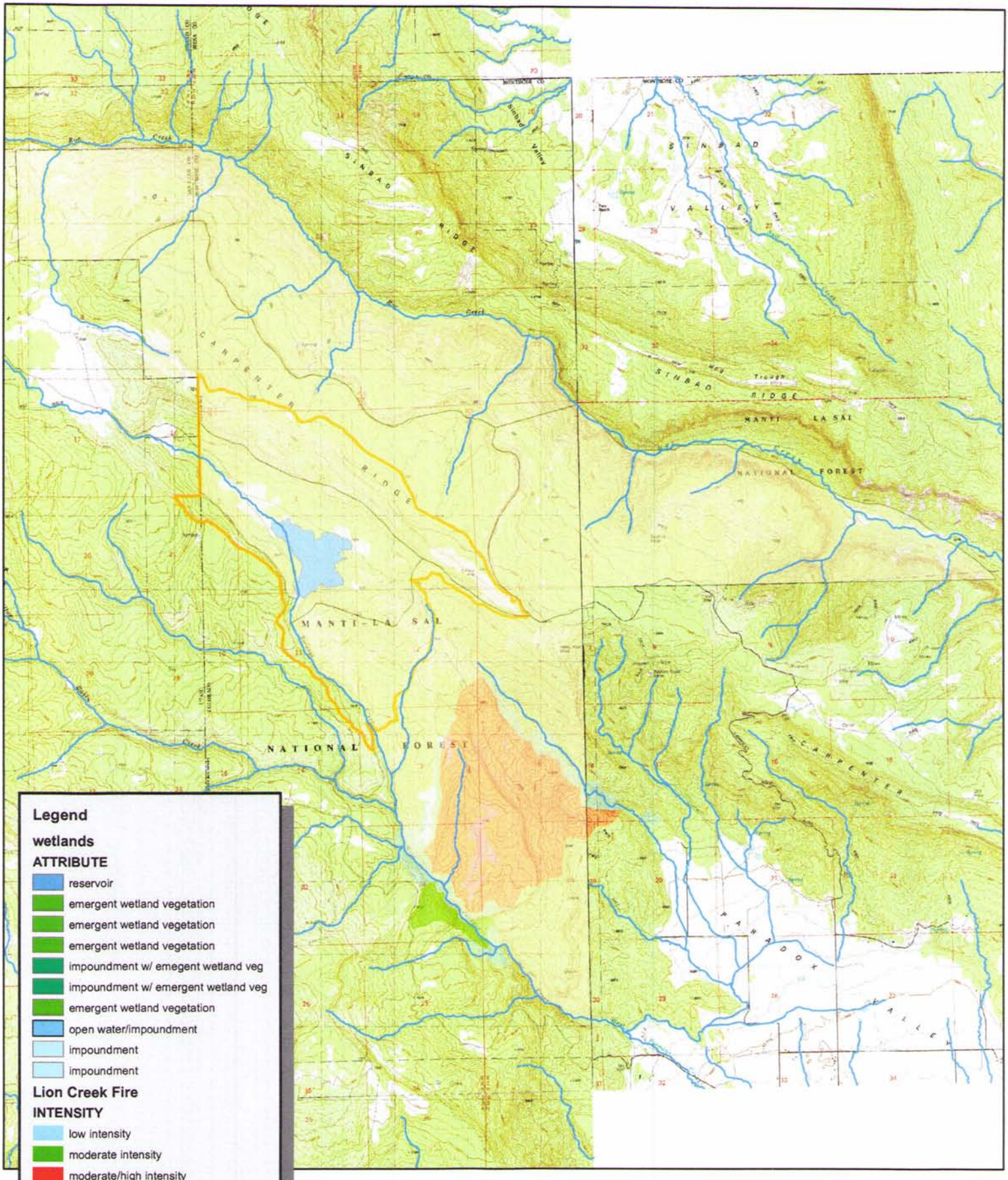
Wetlands

EO 11990 requires the Forest Service to take action to minimize destruction, loss, or degradation of wetlands and to preserve the natural and beneficial values of wetlands.

Small wetlands do exist within the analysis boundary. The following map is based on interpretation of aerial photographs combined with some ground truthing and depicts wetlands and stream riparian areas for the analysis area

North Paradox Allotment

1:65,000



No new construction in wetlands is being proposed with this project. Livestock currently graze and water in wetland areas. Recent proper functioning condition (PFC) assessments indicated that spring/wetlands were in proper functioning condition or functioning at risk with an upward trend and therefore providing water quality benefits by filtering and capturing sediment and buffering high flows and functioning as a recharge area. Other wetlands are functioning similarly. Wetlands are present in the project area, but no significant adverse effects are anticipated with implementation.

Municipal Watersheds

FSM 2542.05 defines a municipal supply watershed as one that serves a public water system as defined in Public Law 93-523 (Safe Drinking Water Act); or as defined in State safe drinking water regulations. The definition does not include communities served by well or confined ground water unaffected by Forest Service activities. The 1996 Safe Drinking Water Act (SDWA) Amendments established a new emphasis on preventing contamination problems through source water protection and enhanced water system management. Formal agreements approved by the Chief of the Forest Service are appropriate only when intensified multiple-use management fails to meet the needs of the water user and use restrictions are necessary.

There are no municipal supply watersheds present within the analysis area or affected by the proposed activity.

Compliance with the Clean Water Act

Beneficial Uses

Stream Segment	Colorado Beneficial Use	
'West Paradox Creek from the source to the confluence with the Dolores River'	Aquatic Life Warm 2	These waters are not capable of sustaining a wide variety of cold or warm-water biota, including sensitive species, due to physical habitat, water flows or levels, or uncorrectable water quality conditions that result in substantial impairment of the abundance and diversity of species
	Recreation E	Existing Primary Contact Use: These surface waters are used for primary contact recreation or have been used for such activities since November 28, 1975
	Agriculture	These surface waters are suitable or intended to become suitable for irrigation of crops usually grown in Colorado, and are not hazardous as drinking water for livestock
'Mainstem of West Creek from the source to the confluence with the Dolores River; Roc Creek; La Sal Creek and Mesa Creek from their sources to their confluences with Dolores River'	Aquatic Life Cold 1	These are waters that (1) currently are capable of sustaining a wide variety of cold water biota, including sensitive species, or (2) could sustain such biota but for correctable water quality conditions. Waters shall be considered capable of sustaining such biota where physical habitat, water flows or levels, and water quality conditions result in no substantial impairment of the abundance and diversity of species
	Recreation E	Existing Primary Contact Use: These surface waters are used for primary contact recreation or have been used for such activities since November 28, 1975
	Water Supply	These surface waters are suitable or intended to become suitable for potable water supplies. After receiving standard treatment (defined as coagulation, flocculation, sedimentation, filtration, and disinfection with chlorine or its equivalent) these

		waters will meet Colorado drinking water regulations and any revisions, amendments, or supplements thereto
	Agriculture	These surface waters are suitable or intended to become suitable for irrigation of crops usually grown in Colorado, and are not hazardous as drinking water for livestock

Stream Segment	Utah Beneficial Use	
Roc Creek and tributaries, from confluence with Dolores River to headwaters	2B Recreation	Protected for secondary-contact recreation, such as boating, wading, or similar uses
	3A Fishery	Protected for cold-water species of game fish and other cold-water aquatic life, including the necessary aquatic organisms in their food chain
	4 Agriculture	Protected for agricultural uses, including irrigation of crops and stock watering. beneficial uses

In addition to the beneficial use classifications, all surface waters, irrespective of ownership, that are geographically located within the outer boundary of a National Forest are designated as High Quality Waters – Category 1. The existing quality of these waters is better than the standards established for the designated uses. This high level of quality is to be maintained. New point source discharges of wastewater, treated or otherwise, are prohibited. Nonpoint sources of wastes shall be controlled to the extent feasible through regulatory programs and implementation of best management practices (UT DEQ/DWQ, 2000a). Best management practices must be designed to maintain the current, high level of water quality (UT DEQ, 2000).

Impaired Waters and/or TMDL's

No waters have been designated impaired within or directly downstream from the analysis area.

Water Quality Monitoring

Because of the lack of perennial streams and the remoteness of the country, none of the streams within or downstream of the analysis area are being monitored for water quality. No field indications of poor water quality were noted at springs or intermittent streams (ie, algae, excess fines, odors, etc.).

The proposed project complies with the Clean Water Act.

References

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