

Appendix I. Assessment of Issues (Step 4)

This section addresses issues associated with the management of forest roads serving the Davy Crockett NF. To complete the assessment, the IDT addressed the 71 questions from Appendix 1 of FS-643 report "Roads Analysis: Informing Decisions about Managing the National Forest Transportation System"(USDA 1999) as well as 11 other questions. The questions from FS-643 focus on the ecological, social, and economic concerns associated with roads. The other questions focus on other concerns raised during the analysis of the Davy Crockett NF forest roads system.

FS-643 describes the questions as,

"...example questions that might be used for roads analysis for both existing and proposed road system. Not all of these questions will be relevant in all places, but these types of questions are expected to be relevant in many of the analysis areas. Some of the questions will be best addressed at the local scale; others will be more appropriate at a regional or multiforest scale. In addition, some of the questions require consideration at several regional, forest, and individual road scales. The questions and associated information are not intended to be prescriptive, but to assist analysis teams in developing questions and approaches appropriate to each analysis area."

Some of the questions are not relevant to the Davy Crockett NF and are not addressed in this report. For example, there are no inventoried roadless areas on the Davy Crockett NF, so roads will not affect any unroaded areas (EF-1). Some of the relevant questions can be adequately addressed in this forest-scale analysis and do not need to be addressed further during smaller-scale project analyses. However, some questions need to be addressed during project-scale analyses when the issues arise. The questions that should be addressed during project-scale analyses (when the issues arise) are listed in the Step 5. *Recommendations, Opportunities, and Priorities* section of this report.

The following questions are divided into the these categories: Ecosystem Functions and Processes; Aquatic, Riparian Zone, and Water Quality; Terrestrial Wildlife; Economics; Timber Management; Minerals Management; Range Management; Water Production; Special Forest Products; Special Use Permits; General Public Transportation; Administrative Use; Protection; Unroaded Recreation; Roaded Recreation; Passive-Use Value; Social Issues; Civil Rights and Environmental Justice; and Other Questions.

4.1 FS-643 Roads Analysis Questions

4.1.1 Ecosystem Functions and Processes (EF)

EF (1): What ecological attributes, particularly those unique to the region, would be affected by roading of currently unroaded areas?

No inventoried roadless areas exist on the Davy Crockett NF. This is not an issue.

The Big Slough Wilderness is a congressionally designated wilderness area. No forest roads will be constructed in the designated wilderness area.

Few new roads need to be developed. Most of the major public roads on the Davy Crockett NF originated over 70 years ago, before federal acquisition of the land. All arterial and collector roads are already in place. Most of these arterial and collector roads are under State or County jurisdiction and are open to public motorized traffic at all times.

Future Forest Service road development activities will probably be associated with local or spur roads. It is unlikely that Forest Service road development activities would affect unroaded areas.

EF (2): To what degree do the presence, type, and location of roads increase the introduction and spread of exotic plant and animal species, insects, diseases, and parasites? What are the potential effects of such introductions to plant and animal species and ecosystem function in the area?

Invasive species tend to enter natural communities along roads and trails. Roads provide recreation opportunities for the public, increasing the probability that out-of-region visitors may import pests into the forest. For example, gypsy moth (*Lymantria dispar*) egg masses deposited on cars or campers in the northeast U.S. could be transported to campsites or other visitor areas in the south. Exotic pest introductions can have significant impacts if not detected early.

In general terms, the greater the amount of traffic on a road, the greater potential for invasive plants to become established. The many County and State public roads that serve national forest and intermingled private lands are heavily traveled in comparison to the limited amount of traffic on Forest Service roads. Therefore, Forest Service roads should have minimal effects on the introduction and spread of exotic plant and animal species, insects, diseases, and parasites. Monitoring for exotic pests on national forest lands in areas of high visitor traffic would reduce their chance of establishment.

Non-native pests found on the Davy Crockett NF are:

Red imported fire ant (*Solenopsis invicta*). This species is well established in this area. The roadways provide avenues for dispersal of the ants. However, fire ants are generally limited to open areas adjacent to the roads and are less likely to colonize woodlands beneath closed canopies.

Invasive exotic plant species can create serious resource management problems throughout the Southern Region. The Southern Region began implementing a Regional Noxious Weed Strategy in June 1999. An important part of this strategy is the development of a regional list of invasive exotic plant species. The following plants are exotic plant species that are known to be invasive and persistent in the east Texas area. These plants can spread into and persist in native plant communities and displace the native plant species, and pose a demonstrable threat to the integrity of the native plant communities.

Tall fescue (*Festuca arundinacea*). This is the most common roadside planting in the area. It has allelopathic properties and forms dense monocultures. The habitat it provides is unsuitable for most native wildlife. It tends to invade open areas, but does not do well in shaded conditions.

Chinese Tallow-tree (*Sapium sebiferum*). This is a rapidly growing tree that can become quickly established in roadside ditches and fencelines as a result of seed dispersal by birds or water. Once established, this species can be costly and time consuming to control. This species is often found in streamside riparian areas near bridges.

Silktree, Mimosa (*Albizia julibrissin*). This is a small tree that rapidly spreads through animal and water dispersal. This species colonizes from root sprouts, forming dense thickets if left uncontrolled.

Sericea Lespedeza (*Lezpedeza cuneata*). This species is a perennial legume that has been regularly planted along roadsides to control soil erosion and provide seed and forage for wildlife. The value to wildlife is considered minimal. Although effective in erosion control, this plant is very aggressive and will outcompete all other forms of native grasses.

Chinese privet (*Ligustrum sinense*) and Japanese privet (*Ligustrum japonicum*). Both these species are prolific seed producers easily establishing themselves along roadside openings. Their rapid growth allows them to form dense monoculture thickets thus quickly displacing all other native plant species.

Kudzu (*Pueraria Montana var lobata*). This woody vine made its first appearance in this country as an excellent forage and erosion control species. However, once established it will form dense roadside patches and restrict all other native plant species. If left uncontrolled, it can spread into the surrounding forest promoting plant mortality by blocking sunlight.

Cogongrass (*Imperata cylindrica*). This is an exotic grass whose range is rapidly expanding in Texas. The plant prefers sandy soils, but can readily establish itself in graded areas along roadsides. It grows in thick clumps, is very aggressive, and will out compete other natural plants. Early detection with treatment is essential in controlling this invasive species.

Japanese Climbing fern (*Lygodium Japonicum*). This fern is a Category 1 weed on the May 2001 [Regional Invasive Plant list](#).

Where identified as an issue, this issue will be further addressed during project-scale analyses.

EF (3): How does the road system affect ecological disturbance regimes in the area? To what degree does the presence, type, and location of roads contribute to the control of insects, disease, and parasites?

Early detection and suppression are important to reduce impacts of forest pests. The primary insect pest on the forest is the southern pine beetle (*Dendroctonus frontalis*). A well-developed road system allows personnel to quickly access, monitor, and take action on expanding southern pine beetle spots. Roads facilitate the implementation of cut-and-remove, the most effective treatment for southern pine beetle spots. Roads also provide access for silvicultural treatments designed to reduce forest health problems, such as thinnings and species conversion.

The existing forest roads system was developed to facilitate timber harvest and provide access into those management areas identified for potential timber harvest through the *Plan*. While some Forest Service roads are closed to public use, the road prisms are still in place and the roads could be opened to facilitate additional management for control of insects and disease.

EF (4): How does the road system affect ecological disturbance regimes in the area?

Fire is the primary ecological disturbance regime affected by the forest roads system. The forest has a low to moderate frequency of low intensity fire regime. The public forest roads and old woods roads allow easy access to national forest lands. The intermingled private and public land ownership and the associated forest roads system allows accidental and arson fires to occur almost anywhere when conditions are conducive to fire. The forest roads system also creates firebreaks and provides access to control wildfires in most of the forest outside of the wilderness.

Regardless of how roads are managed, wildfires will usually be suppressed because of their potential to damage valuable forest resources, such as wildlife habitat, and interspersed public-private resources, facilities, and structures.

EF (5): What are the adverse effects of noise caused by developing, using, and maintaining roads?

Few new roads need to be developed. Most of the major public roads on the Davy Crockett NF originated over 70 years ago, before federal acquisition of the land. All arterial and collector roads are already in place. Most of these are under State or County jurisdiction and are open to public motorized traffic at all times. Future Forest Service road development activities will probably be associated with local roads.

With the well-developed system of State highways and County roads serving the national forest and intermingled private lands and corporate timberlands, the more limited volume of traffic on Forest Service roads will, in comparison, have less adverse effects of noise.

Roads can also result in an increase in the amount of disturbance. Wildlife species have varying “flight distances” relative to their exposure to road disturbance (Hediger 1964). Animals prefer to stay beyond a distance that provides visual and auditory buffers. Nesting birds, including raptors and endangered red-cockaded woodpeckers, can be susceptible to disturbance that is unusual. However, other factors, such as availability of forage and familiarity to the disturbance can shorten this distance. Where roads have existed for years with constant traffic volumes, each resident species will reach a “comfort” distance from the road.

Disturbance and harassment of animal species may also result from vehicles, including off-road all terrain vehicles (ATVs).

4.1.2 Aquatic, Riparian Zone, and Water Quality (AQ)

AQ (1): How and where does the road system modify the surface and subsurface hydrology of the area?

Road surfaces and drainage ditches modify the surface hydrology by concentrating surface runoff and flows. Road cuts and ditches can modify or intercept subsurface hydrology; however, in east Texas, the flat to gently rolling terrain will not often require road cuts. The amount of modification varies by geology and soils in an area.

Roads increase erosion and pollution to streams (USDA 2000a, USDA 2000b).

AQ (2): How and where does the road system generate surface erosion?

Surface erosion is highly dependant on soils, the amount and type of road surfacing, the effectiveness and spacing of drainage structures, and the adequacy of buffer strips. There are approximately 213 miles of maintenance level 3, 4, and 5 Forest Service roads on the Davy Crockett National Forest. About 9 percent of those roads are paved, about 83 percent are aggregate surfaced, and about 8 percent are native soil material.

Most of the forest roads addressed in this analysis are County roads. The counties often use glauconite aggregate instead of limestone to surface roads. The glauconite is a precipitated sedimentary material and will wear down faster than limestone or other rock. The glauconite produces a fine dust during use. Generally, County roads have not been designed or maintained to divert surface water from flowing directly into streams. During initial rainfall, this fine dust can be carried by runoff and directly delivered to streams. Depending on the intensity of the rainstorm

and the gradient of the road surface and ditches, some amounts of aggregate can actually be delivered to the stream along with the sediment. However, aggregate surfacing can significantly reduce the surface erosion on roads especially on grades and on more erosive soils such as sands.

Fine sediments tend to stay in suspension in stream flow until encountering slow water, a lake or when stream flow drops to low levels. Thus, fine sediments are readily transported long distances from the site of generation and the effects of fine sediment can appear many miles from the point of origin. On the Davy Crockett NF, most stream courses flow into the Neches River.

At the forest scale, it is not feasible to estimate the surface erosion rates from roads. Where identified as an issue, this issue would be better addressed during project scale analysis.

AQ (3): How and where does the road system affect mass wasting?

Mass wasting is not a significant concern on the Davy Crockett NF. However, minor sloughing occasionally occurs on cut-slopes that are made in soils with a Lithologic Discontinuity (having different parent material). The geology and soils are relatively stable.

The Davy Crockett NF lies within the Gulf Coastal Plains Physiographic Province. The topography is generally flat to gently rolling with a few steep slopes on the northern part of the forest and along the Neches River i.e. Neches Bluff. The soils are derived from unconsolidated sandy and clayey sediments deposited when east Texas was covered by shallow seas.

Since,

- most of the forest roads system addressed in this analysis is constructed, and
- the topography is generally flat to gently rolling,

there will not be significant mass wasting occurring during road construction in the future.

AQ (4): How and where do road-stream crossings influence local stream channels and water quality?

Roads that cross streams can affect stream structure and water quality. The impact roads have on stream structure and water quality depends on factors such as road density, composition, road design, and road condition. Each stream crossing is a potential site for altering stream structure and introducing sediment and other contaminants.

Road crossing structures can change the stream channel and funnel streams through restrictive structures that increase water velocity and turbulence. This can cause stream banks to slough and down-cut, widening and deepening the streamcourse.

Culverts can change the velocity of the stream to the extent that water turbulence off the end of the culvert can create a cavity and eventually lower the stream bed. Such a culvert-created cavity can prevent fish passage back through the culvert.

Water quality can be affected by siltation from rain runoff and sloughing stream banks.

Where identified as an issue, this issue will be further addressed during project scale analysis. The forest road stream crossings will be inventoried during more site-specific or project scale analysis to identify sedimentation or fish passage problems.

AQ (5): How and where does the road system create potential for pollutants, such as chemical spills, oils, deicing salts, or herbicides, to enter surface waters?

The potential for chemical contamination of surface water increases with road density. Chemical contaminants related to roads include herbicides, fertilizers, and a wide range of other chemicals used on and transported on forest roads. State and County roads are treated with a wide range of herbicides to control the growth of roadside vegetation; however, the use of herbicides is more restricted on Forest Service roads.

Other potential sources of chemical contaminants include:

- The aggregate surfacing on roads can contain chemical contaminants which can be released as the aggregate wears and is broken down to dust.
- The use of creosote products in wooden bridge structures has been shown to be a source of contaminants for aquatic organisms.
- The illegal dumping of household and industrial chemicals at bridges including batteries, solvents, waste oil and caustic soda.
- The illegal dumping of excess saltwater from oil well production facilities on roads, road ditches, and at bridges. Such excess saltwater is usually disposed of thru injection wells drilled into subsurface saltwater aquifers.
- Old roads which contain reclaimed motor oil that was used in the past as a dust abatement treatment. Forest Service roads were not treated with reclaimed motor oil.

Chemicals spills resulting from accidents are a potential contamination source. Most of the arterial and major collector roads are in good condition. This should reduce the risks of chemical spills from over-the-road transports. However, many minor collector roads receive only minimal maintenance or have been reconstructed using methods that allow contaminants to seep into the ground.

The forest has a Hazardous Spill Plan in the event an accident occurs that threatens national forest lands and waters.

AQ (6): How and where is the road system “hydrologically-connected” to the stream system? How do the connections affect water quality and quantity?

The road system is “hydrologically-connected” to stream systems where roads cross streams and where roads enter the streamside riparian area. Stream crossings are primarily where roads and streams interact (USDA 2000a). Roads that cross streams can affect stream structure and water quality. Each stream crossing is a potential site for altering stream structure and introducing sediment and other contaminants.

Roads affect water quantity by concentrating rain runoff in cleared road corridors and ditches rather than rain runoff in sheet form over vegetated terrain. This allows runoff velocities to exceed the buffering capacity of the ground vegetation. Rills and gullies can form and stream banks can slough and down-cut. Road crossing structures can redirect and funnel streams through restrictive structures that increase water velocity and turbulence. This can also cause stream banks to slough and down-cut, widening and deepening the streamcourse.

Incised roads can expose soil layers, releasing sub-surface water into road ditches and causing more water to flow into streams, changing hydrologic regimes.

Water quality can be affected by sediment carried by rain runoff and from sloughing stream banks. The sediment from roads can cause the following biological effects:

- Sediment lowers the permeability of gravel beds, degrading habitat for spawning fish

(Binkley and Brown 1993). However, gravel and gravel beds do not often occur in streams in east Texas.

- Increases in stream sediment reduce percolation and aeration in stream substrates, smothering fish eggs and fry and restricting fish emergence from nests. (Cordone and Kelly 1961, Sheldon and Pollock 1966, Hassler 1970).
- Sediment reduces the number and depth of pools, creating reaches with a uniform stream bottom contour. Such changes alter stream flow patterns and reduce pool:riffle ratios to the detriment of aquatic ecosystems. (Filipek 1986)
- Reductions in benthic macroinvertebrate density (Tebo 1955; Cordone and Kelly 1961; Leudtke et al. 1976) and shifts in species composition (White and Brynildson 1967 and Chutter 1969) were observed in situations where sedimentation increased. Many fish are dependent on these invertebrates for food.
- Sediment alters aquatic environments, chiefly by screening out solar radiation, by blanketing the stream bottom, and by retaining organic material and other substances which create unfavorable conditions at the bottom. Sediment acts as an opaque screen to all wavelengths of visible light and alters the rate of temperature change. (Ellis 1936).
- Layers of fine sediment from .25-1.00 inch thick, produced a very high mortality among freshwater mussels living in gravel and sand beds. (Ellis 1936).
- The Environmental Protection Agency (EPA) noted that 20 mg/m³ suspended solids caused behavioral anomalies and 200 mg/m³ caused death in fish (Little and Mayer 1993).
- Sediment can cause clogging and abrasion of respiratory surfaces, hinder foraging and spawning, induce hypoxia, smother benthic organisms, interfere with feeding and growth of filter feeders, and reduce resistance to disease (McDaniel 1993).

Although rare in our area, some streams have shown high pH values, possibly from runoff containing residue from limestone road aggregate.

The *Plan* FW-053 Standard says “to provide surface water drainage away from streams and into vegetated buffer strips or other filtering system.” If this standard was applied as roads were constructed and reconstructed, the road system would become less “hydrologically-connected” to the stream system. However, to ensure our road contractors are aware of the specific road plans and specifications designed to implement this standard, the road plans and specifications should be reviewed during pre-work conferences with contractors.

We have developed standard road construction designs and specifications to drain rain runoff into filter strips or retention basins instead of directly into streams to reduce stream sedimentation. We can also,

- **install oversized culverts below the existing stream bed to preserve the natural stream bed structure and slope, and**
- **use silt fencing or comparable barriers to reduce the sedimentation of streams during road construction.**

Where identified as an issue, this issue will be further addressed during project-scale analyses.

AQ (7): What downstream beneficial uses of water exist in the area? What changes in uses and demand are expected over time? How are they affected or put at risk by road-derived pollutants?

The national forest lands serve hydrologically as a sponge that receives and stores water. Some water percolates down to underground aquifers and some is released into the streams and rivers. The Davy Crockett NF lies in the Trinity and Neches River basins. Most stream courses crossing national forest and intermingled private or corporate lands flow into the Neches River. The quality of the water is of increasing importance to downstream recreation, industrial, and municipal use.

We assume the demand for water from communities adjacent to the Davy Crockett NF will increase as the population grows. However, with increasing water shortages, the demand for water should increase from communities adjacent to the Neches and Trinity Rivers as well as from distant urban areas, such as Beaumont or Houston.

The pollutants originating from roads can impact water quality and aquatic organisms, and in turn affect fisheries and water users. However, about three-quarters (78 percent) of the forest roads are State and County roads serving the national forest lands and intermingled private lands and corporate timberlands. The FS does not monitor the effects of State and County roads on water quality.

AQ (8): How and where does the road system affect wetlands (and riparian areas)?

Wetlands are those areas that are flooded for periods during the growing season, have hydric soils, and have vegetation dependent on wet ground conditions. The vegetation can be quite variable depending on frequency and duration of flooding.

Roads can affect wetlands and riparian areas by direct encroachment, by modifying the hydrology and by the introduction of sediment. Roads can modify both surface and sub-surface drainage in wetlands and riparian areas, causing changes in wetland moisture regimes. Where roads cross or are near wetlands, the effect on the form, process, and function of wetlands is dependent on the degree which the local hydrology is modified, in terms of flow quantity, timing, routing, and water quality.

The *Plan* FW-214 Standard says “Design roads according to Best Management Practices.” The Texas Best Management Practices says, “As mandated by Amendments to the Clean Water Act, forest roads in jurisdictional wetlands... must be constructed and maintained in accordance with the following Best Management Practices to retain Section 404 exemption status.”

Where identified as an issue, this issue will be further addressed during project-scale analyses.

AQ (9): How does the road system alter physical channel dynamics, including isolation of floodplains, constraints on channel migration, and the movement of large wood, fine organic matter, and sediment?

Roads that cross streams can affect stream structure and water quality. Each stream crossing is a potential site for altering stream structure and introducing sediment and other contaminants.

Stream channels are dynamic. They transport and deposit large pieces of woody debris and fine organic matter, providing physical structure and diverse aquatic habitat to the channel. When roads encroach on stream channels, these processes can be modified.

- Wood and sediment can be trapped behind stream crossings, reducing downstream transport and increasing the risk of stream crossing structure failure during rains.
- The stream crossing structures can funnel streams through restrictive structures that increase water velocity and turbulence. This can cause stream banks to slough and down-cut, widening and deepening the streamcourse.
- Culverts can change the velocity of the stream to the extent that water turbulence off the end of the culvert can create a cavity and eventually lower the stream bed. Such a culvert created cavity can prevent fish passage back through the culvert.

Road alignment and road fills can isolate floodplains, constrict stream channels, constrain stream channel migration, and limit riparian and aquatic habitat.

AQ (10): How and where does the road system restrict the migration and movement of aquatic organisms? What aquatic species are affected and to what extent?

Road crossing structures can become barriers to fish movement within drainages (USDA 2000b).

As stated earlier, culverts can change the velocity of the stream to the extent that water turbulence off the end of the culvert can excavate a cavity and lower the stream bed below the culvert. Such a culvert-created pool can prevent fish passage back through the culvert. Pools created by culverts can entrap fish during drought or low water, cutting them off from refugia in lower order streams and subjecting them to possible hazards occurring at stream crossings, such as sediment, solar exposure and higher water temperatures, chemical contaminants such as herbicides, and the dumping of household and industrial refuse.

Box culverts can spread low stream flows to the point that the stream flows are no longer navigable by fish.

The *Plan* FW-055 Standard says, "Provide road... design and construction that allows unrestricted fish passage." The installation of oversized culverts below the existing stream bed can reduce risks to fisheries resulting from the construction of stream crossing structures.

Where identified as an issue, this issue will be further addressed during project-scale analyses.

AQ (11): How does the road system affect shading, litter fall, and riparian plant communities?

Where roads cross streams or streamside riparian areas, roads can reduce vegetative cover and expose riparian zones to solar radiation. The reduction in vegetative cover due to roads can alter light regimes increasing water temperatures. Changes in light and temperature within an aquatic environment can alter breeding schedules and food availability; however, the effect of such changes at stream crossings will be momentary if water flows on downstream under vegetative cover and water temperatures return to normal. The reduction in vegetative cover can have a significant affect if fish are entrapped in an unshaded culvert pool during drought or low water.

AQ (12): How and where does the road system contribute to fishing, poaching, or direct habitat loss for at-risk aquatic species?

The road system is "hydrologically-connected" to streams where roads cross streams and where roads enter the streamside riparian area. Stream crossings are primarily where roads and streams interact (USDA 2000a). Each stream crossing is a potential site for altering stream structure, introducing sediment and other contaminants, and introducing non-native aquatic species.

The Sabine Shiner (*Notropis sabiniae*) has been found in the Cochino Bayou on the Davy Crockett NF and other streams in east Texas. The minnow historically inhabited clear rivers with a sand and small gravel substrate. Sabine Shiners need 13 miles of uninterrupted sandy, silt-free habitat (AFS 2003) per population. A single fish passage problem can render an entire reach of suitable stream habitat unsuitable.

Although the Forest Service manages fisheries habitats on the Davy Crockett NF, the Texas Parks and Wildlife Department (TPWD) regulates and manages sport fishing throughout the state.

Where identified as an issue, this issue will be further addressed during project-scale analyses.

AQ (13): How and where does the road system facilitate the introduction of non-native aquatic species?

The illegal stocking of non-native species is of growing concern. Illegal stocking ranges from the simple releasing of a family pet to deliberate releases by individuals seeking to establish new fish populations. The bait bucket releases of aquatic species are the most common method of introducing non-native aquatic species on the Davy Crockett NF. The frequency of bait bucket releases is directly related to fishing frequency, therefore locations with high fishing frequency also have higher incidents of illegal stocking by bait bucket releases. Roads can provide access for illegal stocking (USDA 2000b).

AQ (14): To what extent does the road system overlap with areas of exceptionally high aquatic diversity or productivity or with areas containing threatened, endangered, or sensitive aquatic species or species of interest?

Areas of exceptionally high aquatic diversity or productivity and areas containing threatened, endangered, or sensitive aquatic species or species of interest will be identified during more site-specific and project-scale analyses.

Where identified as an issue, this issue will be further addressed during project-scale analyses.

4.1.3 Terrestrial Wildlife (TW)

TW (1): What are the direct effects of the road system on terrestrial species habitat?

Roads can contribute to the mortality of slow-moving animals such as eastern box turtles (*Terrapene carolina*). Other reptiles and amphibians such as frogs and snakes also frequent roads near streams and ponds, especially after a rain. Moving vehicles easily kill these animals.

Vehicle collisions occasionally cause mortality to many other animal species including: white-tailed deer (*Odocoileus virginianus*), armadillo (*Dasypus armadillo*), raccoons (*Procyon lotor*), opossums (*Didelphis virginiana*), skunks (*Mephitis mephitis*), and squirrels (*Sciurus carolinensis*) among others. Collisions can also cause mortality among bird species that are inadvertently hit by rapidly moving vehicles.

Roads are used as a travel corridor by some animal species, especially predators. Some examples include: skunks, opossums, and bobcats (*Lynx rufus*). Roads are easy to travel along and may allow predators increased access to areas. As a result, increased predation may occur.

For some species, roads represent a barrier to dispersal and travel, instead of a travel corridor. Some of the species for which roads may be a barrier are reptiles, amphibians, and ground nesting avian species (females traveling with chicks unable to fly). The road width and type of surfacing type determine the degree to which a road may be a barrier. For example, narrow revegetated dirt roads shaded by an adjacent tree canopy may not be a barrier.

The road width and type of surfacing determine the degree to which a road may fragment habitat. Roads can result in habitat fragmentation for some species of waterfowl, reptiles, amphibians, and neotropical birds. Some animals prefer largely undisturbed forest habitat. A road can divide potentially suitable habitat, making the area unattractive or unsuitable for some animal species, due to a decrease in the amount of contiguous habitat and an increase in the amount of edge or early successional habitat.

Roads can also result in an increase in the amount of disturbance. Nesting birds, including raptors and endangered red-cockaded woodpeckers, can be susceptible to disturbance that is unusual. Disturbance and harassment of animal species may also result from vehicles, including off-road all terrain vehicles (ATVs).

Analysis of the effects of roads on terrestrial species habitat must consider processes and conditions across scales, so effects will be best determined during project-scale analyses.

TW (2): How does the road system facilitate human activities that affect habitat?

Most of the major public roads on the Davy Crockett NF originated over 70 years ago, before federal acquisition of the land. All arterial and collector roads are already in place. Most of these arterial and collector roads are under State or County jurisdiction and are open to public motorized traffic at all times. Only about one-quarter (22 percent) of the forest roads addressed in this analysis are Forest Service roads; about three-quarters (78 percent) are State and County roads.

The State, County, and Forest Service roads provide access for human activities that affect habitat on national forest lands as well as intermingled private lands and corporate timberlands.

Wildlife species have varying “flight distances” relative to their exposure to road disturbance (Hediger 1964). Animals prefer to stay beyond a distance that provides visual and auditory buffers. However, other factors, such as availability of forage and familiarity to the disturbance can shorten this distance. In urban areas where deer are accustomed to non-threatening human disturbance, deer can be seen in broad daylight calmly moving or grazing along busy roads. The key is the disturbance familiarity timeframe.

Where roads have existed for years with constant traffic volumes, each resident species will reach a “comfort” distance from the road. Theoretical avoidance corridors can be determined for each species flight distance and cover. The corridor, for example, would be much narrower for an opossum than for a bobcat. New road construction could cause wider avoidance corridors due to the lack of familiarity with the disturbance. So, a corridor wider than the new road right-of-way can become unusable or degraded habitat due to disturbance. However, as each resident species becomes more familiar with the road disturbance, the avoidance corridor will become narrower.

Studies in heart rate telemetry have established flight distance and stress parameters in many wildlife species, including, reptiles, birds, ungulates and other mammals. Many animals can exhibit stress responses to various stimuli, without moving. The disturbance stimuli can be auditory and/or visual. Roads with intermittent use, such as gated roads opened for hunting, can cause stress on wildlife due to the sudden increase in disturbance. Peterson (1987) showed that ungulate heart rates elevated 50 percent in response to a passing pickup on a seldom used road. Such responses increase energy expenditure and a tax other bodily functions.

Section 9 of the Endangered Species Act does not permit the disruption of the “breeding, feeding or sheltering” of federally protected species. The familiarity to the disturbance appears to be the key to preventing such impacts in red-cockaded woodpeckers (RCW). Sudden disturbances, such as chain saws and loud stereos have caused RCW to abandon their nests, while others fledged healthy nestlings adjacent to military bombing ranges, where such activities were routine (Jackson 1983).

Roads also allow greater access for lawful hunting. Many hunters do not travel great distances from a road to hunt; therefore, the survival of game species found in proximity to an open road may be lower.

Traffic on State, County, and Forest Service roads may occasionally inhibit management activities that affect habitat such as preventing prescribed burning due to impacts of smoke on nearby roads or highways.

TW (3): How does the road system affect legal and illegal human activities? What are the effects on wildlife species?

Open roads facilitate access for legal hunting and trapping activities, but these legal activities are not adversely affecting wildlife species populations. Legal hunting activities can beneficially affect wildlife populations by keeping populations in check, etc.

Unlawful activities, such as poaching, can be a problem in areas accessible by roads. White-tailed deer and wild turkeys (*Meleagris gallopavo*) are two species that are often observed near roads and are susceptible to poaching. While instances of illegal hunting activities on roads are known to occur primarily during big game hunting seasons, these activities are not significantly affecting wildlife species populations.

The illegal collecting of animals is another example of an unlawful activity facilitated by roads. Eastern box turtles are slow moving and often found on or near roads, which facilitates collection.

Sportsmen rely on the national forest hunting areas with good road access and quality habitat maintenance programs. The amount of hunting on national forest land and the influence hunters have will continue to increase as hunting on private lands becomes more restricted.

4.1.4 Economics (EC)

EC (1): How does the road system affect the agency's direct costs and revenues? What, if any, changes in the road system will increase net revenue to the agency by reducing cost, increasing revenue, or both?

The Davy Crockett NF receives revenues from commercial permits and cooperative maintenance agreements associated with the use of Forest Service roads for private and corporate commercial activities, such as timber harvesting and oil/gas well drilling. The Davy Crockett NF also receives road maintenance revenue from the purchasers of national forest timber.

Generally, higher standard roads result in higher bids for timber sales. For example, a well surfaced all-weather road from a paved road to a timber sale area containing soils that can be logged during wet winter weather will usually result in higher bids for the timber.

The transfer of heavily used Forest Service roads to the County or State could reduce road maintenance costs.

EC (2): How does the road system affect the priced and non-priced consequences included in economic efficiency analysis used to assess net benefits to society?

The purpose of this question is to address economic efficiency from the societal point of view. Economic efficiency goes beyond financial efficiency. Economic efficiency analysis measures the net economic benefit to society in aggregate, including non-market values as well as external costs and benefits, without regard for who gains and who loses. The economic efficiency question asks whether a specific investment produces more aggregate economic value than it costs at the scale in question. Economic efficiency analysis may include consequences that we cannot express in dollars.

Examples of benefits included in economic efficiency analysis include the increased quality and value of water flowing from national forest lands, the value of recreation experiences provided free-of-charge, and passive-use values. Examples of costs include decreased quality and value of water flowing from national forest lands, sedimentation of fish habitat, and fragmentation of species habitat resulting from management activities. Economic distribution effects such as employment, income, who benefits, and who pays are not included. They are the focus of distribution analysis as covered under EC (3).

Although passive-use value is a component of economic efficiency analysis, we address it after the recreation section below. Passive-use value in roaded areas can be lost with planned road decommissioning.

EC (3): How does the road system affect the distribution of benefits and costs among affected people?

When doing economic distribution analyses, we identify the distribution of benefits and costs in society. Distribution analyses can be either financial or economic. Financial distribution analyses include only direct cash flows. Examples include job and income gains or losses by different sectors of the economy. Economic distribution analyses add non-market values and external values and costs. Examples of this type of distribution analyses include who incurs the negative effects of air or water pollution and who benefits from enhanced scenic beauty or solitude.

It is likely that the public road system managed by Forest Service benefits rural and urban people of both sexes and people of varying ages, education levels, and incomes.

4.1.5 Timber Management (TM)

TM (1): How does road spacing and location affect logging system feasibility?

The majority of the lands [Management Area (MA) 1 and MA-2] on the Davy Crockett NF are suitable for timber production. These flat to gently rolling lands are also suitable for ground-based logging equipment such as rubber-tired skidders. Ground-based logging equipment usually needs closer road spacing than cable or helicopter logging equipment.

The arterial and collector forest roads are in place and are composed mostly of State highways and County roads. Many of the County roads serving national forest timber sales have been improved under cooperative road agreements. The majority of the Forest Service roads serving the lands suitable for timber production have been constructed and reconstructed as part of the many timber sales over the years. However, a few local or spur roads may need to be constructed to access small or isolated tracts of national forest lands.

TM (2-3): How does the road system affect managing the suitable timber base and other lands? How does the road system affect access to timber stands needing silvicultural treatment?

The current ML-3, 4, and 5 Forest Service roads provide adequate access for monitoring, managing, and the silvicultural treatment of most of the national forest lands suitable for timber production.

4.1.6 Minerals Management (MM)

MM (1): How does the road system affect access to locatable, leasable, and salable minerals?

The public road system provides adequate access to federal minerals.

Mineral resources are available for exploration and development on selected areas of the forest. The *Plan* (1996 EIS Appendix C) includes the following description of the oil and gas potential:

“The National Forests in Texas... lie in what is known geologically as the East Texas Basin.”

“One hundred percent of the Davy Crockett National Forest lies inside of the Tyler basin structural play; that acreage comprises 10 percent of the total play. About 50 percent of the Davy Crockett National Forest is within the Woodbine-Eagle Ford play; that acreage comprises some 15 percent of the total play. The Davy Crockett National Forest is also along the Austin-Buda fractured Chalk trend. This southwest-northeast trend contains approximately 50 percent of the forest. There are currently five vertical oil wells in the Laura Lavelle Field. The average well site is 0.53 acres with 0.03 miles of new road built. The average total depth is 1,800 feet. Possible future exploration is expected in the Laura Lavelle Field.

At least two Class 6 fields, Decker Switch and South Laura Lavelle, are part of the Tyler basin structural play within the Davy Crockett National Forest. There is no Class 6 production within the Davy Crockett National Forest within the Woodbine-Eagle Ford play. Because of the production on the forest, its location within two of the major East Texas Basin plays, as well as within the Austin-Buda fractured chalk play within the Gulf Coast Basin, the Davy Crockett National Forest has high potential for occurrence.”

The development of oil and gas reserves is expected to increase on the Davy Crockett NF. The *Plan* (1996 EIS Appendix C) says there were a total of 5 wells on the forest,

“There are currently five vertical oil wells...”

However, as of June, 2003, there were a total of 63 wells on the forest.

The need for roads to access well sites should be addressed during project-scale analyses.

4.1.7 Range Management (RM)

RM (1): How does the road system affect access to range allotments?

There are no permitted range allotments or range maintenance activities on the Davy Crockett NF.

4.1.8 Water Production (WP)

WP (1): How does the road system affect access, constructing, maintaining, monitoring, and operating water diversions, impoundments, and distribution canals or pipes?

This is not an issue on the Davy Crockett NF.

WP (2): How does road development and use affect water quality in municipals?

Few new roads need to be developed because most of the forest roads are in place. Future Forest Service road development activities will probably be associated with short local or spur roads to small or isolated tracts.

Road used in areas that supply domestic water may affect the water quality by introducing sediment and other pollutants into the water.

Analysis of the effects of roads on water quality must consider processes and conditions across scales. Where identified as an issue, this issue will be further addressed during project-scale analyses.

WP (3): How does the road system affect access to hydroelectric power generation?

This is not an issue on the Davy Crockett NF.

4.1.9 Special Forest Products (SP)

SP (1): How does the road system affect access for collecting special forest products?

The collection of special forest products from the Davy Crockett NF is a minor recreation activity. Fruits, nuts, and mushrooms are some of the more popular forest products that are collected on the forest. Forest products such as blackberries, raspberries, walnuts, hickory nuts, pecan, or rose hips may be collected. Pine cones are an often-collected "fruit." Firewood may be collected in specific areas with a permit.

The Davy Crockett NF has a well-developed system of State and County as well as Forest Service roads that make access to the forest to collect special forest products easy.

Where identified as an issue, the direct affects of the road system on collecting special forest products will be addressed during project-scale analyses.

4.1.10 Special Use Permits (SU)

SU (1): How does the road system affect managing special use permit sites (concessionaires, communication sites, utility corridors, etc)?

There are a variety of roads on the Davy Crockett NF under special use permit. It is important to ensure the roads are constructed and maintained to appropriate standards to minimize adverse environmental affects. It is also important to properly decommission a special use road when no longer needed. Proper rehabilitation of these roads will help minimize sedimentation of streams and permit the natural vegetation of the road.

Where identified as an issue, this question will be addressed during the project-scale analyses.

4.1.11 General Public Transportation (GT)

GT (1): How does the road system connect to public roads and provide primary access to communities?

The numerous State and County roads on the forest road system provide the primary access to rural communities. However, because of the interspersed nature of national forest lands, private lands, and corporate timberlands, some Forest Service roads provide access to rural residences and communities in addition to the State and County roads.

GT (2): How does the road system connect large blocks of land in other ownership to public roads (ad hoc communities, subdivisions, in holdings, and so on)?

The national forest lands are scattered and interspersed with private lands and corporate timberlands. The national forest lands comprise only 41 percent of the lands within the proclaimed boundaries of the Davy Crockett NF.

The road system on the Davy Crockett NF is composed of State, County, and Forest Service roads and serves as access for private lands and corporate timberlands as well as national forest lands. Most of the major roads are under State or County jurisdiction and are open to public motorized traffic at all times. The State and County roads comprise about three-quarters of the forest roads addressed in this analysis (State, County, and ML-3, 4, and 5 Forest Service roads).

The *Plan* says (p136),

“With State, County, and Forest Service routes, a transportation system now exists that meets the need for access into most areas.”

However, the potential exists for the need to develop special-use roads across national forest lands to access leased minerals or private tracts.

GT (3): How is the management of the roads system affected by shared ownership of roads or limited jurisdiction over roads? (RS 2477, cost share, prescriptive rights, FLPMA easements, FRTA easements, DOT easements)?

The forest roads system on the Davy Crockett NF is composed of State, County, and Forest Service roads. The State and County roads comprise about three-quarters (78 percent) of the road system addressed in this forest-scale analysis. Most of the major roads are not under the jurisdiction of the Forest Service and the Forest Service does not have authority to manage those roads.

Most of the major roads serving the Davy Crockett NF already existed before federal land acquisition began. The Forest Service authority to manage a small number of those roads comes from Resolution Orders of the respective County Commissioners Court. The Resolution Orders declared the roads to be public roads under the jurisdiction of the Forest Service. The actual statement in the orders is “maintenance jurisdiction,” but that statement has been interpreted by the courts to include regulation of commercial hauling.

The State “Farm-to-Market” or FM roads are essentially highways. Some County roads are paved, but most County roads are surfaced with aggregate or native material. The traffic on County Roads can not be regulated because much of the traffic is residential (to work, to school, school bus, mail route, etc.)

The Forest Service has entered into Road Cooperative Agreements (con conversationally referred to as "Coop Maintenance Agreements", although not limited to road maintenance) with all the respective counties. The agreements include virtually all the County roads that serve or cross national forest land. With few exceptions, the Counties have allowed the Forest Service to perform whatever work was deemed appropriate, and have often participated as well. The Forest Service has surfaced many miles of these roads with gravel or crushed stone, and cooperated in other ways; however, much work remains to be done to bring all these County roads to a condition that will meet Forest Service standards.

"Prescriptive Rights" refers to those road-use rights that are acquired and held by a history of established use. There were, probably still are, numerous roads used by the public for which there is no documented easement. Many old Forest Service roads fell into this category. The right to use such a road derives from the common law and is similar to the acquisition of land title by adverse possession. A prescriptive right to use a road confers, by necessity, a right to maintain it, to keep it passable, but no right to improve it. The reconstruction of these roads was therefore stymied by the lack of documented easements. However, the State alleviated this problem with one simple expedient: The Transportation Code (Chapter 251) states that an old established road becomes a County Road by an order of the respective County Commissioner's Court. Thereupon, many of the restrictions of prescriptive rights become moot. Within the existing road alignment and within certain limits, a County road can be improved as necessary.

There is no shared ownership of roads on the Davy Crockett NF.

RS 2477 is not applicable in Texas. This authority is applicable only to certain road right-of-ways in some western states.

There are no cost share roads (Forest Development Road Cooperative Construction and Use Agreements) on the Davy Crockett NF. These Cost Share Agreements are usually made when Forest Service and private industrial timberland owners have intermingled lands where acreage, timber resources, and their respective road system needs are similar. Temple-Inland, International Paper, and Louisiana Pacific timberlands are intermingled with national forest lands in east Texas. However, where these Cost Share Agreements are used, there is usually limited access to areas. There are often only one or two feasible access routes to thousands of acres of timberlands in intermingled ownership. In east Texas, the incentive to cooperate in the construction and maintenance of a road system is negated by the prevalence of State and County roads and the number of access routes available.

FLPMA easements are not for roads. They are special use easements granted to private entities for private driveways, campgrounds, ski areas, etc.

Forest Road and Trail Act (FRTA) easements are usually issued to public agencies (Counties and Cities) to use FS roads. On NFGT, we usually grant special use permits for County roads, just like the permits we grant to private road permit applicants. County roads crossing national forest land with no easement whatsoever have, for all practical purposes, the same standing with the Forest Service as any other County road.

United States Department of Transportation (DOT or US DOT) easements are granted by FHWA to TXDOT (State of Texas) for highway right-of-ways. Farm-to-Market Roads are considered State Highways in this context.

Many roads on national forest lands are authorized by special use permits issued to individuals for access to adjacent private lands. Most of these roads are not within the scope of the forest-scale analysis (ML-3 or above), but are typically short driveways that could be typified as "woods roads." A few are residential driveways, but in those cases they are usually well maintained by the permittee and cause only minimal impacts.

GT (4): How does the road system address the safety of road users?

The forest roads system is composed of State, County, and Forest Service roads. The State and County roads comprise about three-quarters (78 percent) of the forest road system addressed in this forest-scale analyses. So, most of the major forest roads are not under the jurisdiction of the Forest Service and the Forest Service does not have authority to manage those roads. The State and County have responsibility to provide for public safety on those roads.

However, the Forest Service has entered into cooperative agreements to improve forest roads not under our jurisdiction, but that serve national forest lands. For those roads under Forest Service jurisdiction, public safety is the most important concern for management.

Where identified as an issue, public safety on individual roads will be addressed during site-specific project-scale analyses.

4.1.12 Administrative Use (AU)

AU (1): How does the road system affect access needed for research, inventory, and monitoring?

People conducting research on the Davy Crockett NF have not identified the forest roads system as an issue. We believe that the forest roads system, including State and County as well as Forest Service roads, provides adequate access for research, inventory, and monitoring.

AU (2): How does the road system affect investigative or enforcement activities?

Unlawful activities are often addressed in road issues. Illegal use of closed roads, unauthorized collecting of forest products, and indiscriminate trash dumping are just a few examples of these activities. However, the same roads that provide access for illegal activities also provide access for law enforcement to prevent and investigate these activities.

The forest roads system provides access to the forest for a variety of purposes. As long as there is adequate access to the forest, illegal activities will occur.

Where identified as an issue, individual roads will be addressed during project-scale analyses.

4.1.13 Protection (PT)

PT (1): How does the road system affect fuels management?

Roads are an invaluable asset in fuels management. The forest roads system provides access for personnel and equipment to treat hazardous fuels, serves as control lines for prescribed burns, and most importantly serves as an escape route and safety zone during prescribed burning and wildfire fighting operations.

PT (2): How does the road system affect the capacity of the Forest Service and cooperators to suppress wildfires?

The most efficient and safest way to get firefighters and firefighting equipment to a wildfire is on roads. It is the quickest way for fire departments to respond to fires in the urban interface with fire fighting equipment to suppress fires before homes and other structures burn.

The budget system used by the Forest Service for fire management is the National Fire Management Analysis System (NFMAS). This program relies heavily on road access to ascertain response times to certain areas and then formulates a staffing level and budget for the area. Closing roads or lowering road standards would have a detrimental impact on response times and the fire budget for a given area.

As state in **PT (1)** above, roads serve as an integral part of wildfire suppression. Roads provide access to areas, serve as control lines, and most importantly serve as an escape route and safety zone during wildfire fighting operations.

PT (3): How does the road system affect risk to firefighters and to public safety?

A well-developed road system in an area improves access, reduces response times for firefighters to get to residential and other structures, thereby reducing risks to the public and firefighters.

Most importantly, roads serve as escape routes and safety zones for wildfire fighting operations.

PT (4): How does the road system contribute to airborne dust emissions resulting in reduced visibility and human health concerns?

Road dust is a very minor problem in east Texas.

The dusting of a road surface is a function of road surfacing particle size; traffic volume, speed and weight; and, most dramatically, the moisture content of the road surfacing material and the ambient air.

Moisture content of the surfacing material is critical. The typical high humidity and associated road surface moisture reduce road dusting in east Texas. The traffic on Forest Service and County roads in east Texas does not normally generate enough dust to cause visibility problems. Any visibility problems will decrease as Counties continue to pave more of their higher-traffic volume roads.

The type of aggregate surfacing material affects the degree of dusting. Certain materials, such as crushed limestone, are more prone to dust than other materials such as sandstone.

Heavier trucks are many times more likely to cause dusting than passenger cars.

The ML-3, 4 and 5 FS roads and County roads serving the Davy Crockett NF account for almost all the airborne dust particle emissions. The slower traffic speeds on lower maintenance level roads, even when used by heavy logging truck traffic, tends to reduce dusting to a minimum. The higher maintenance level roads are usually surfaced with crushed aggregate and are less prone to dusting at any given speed than the native or pit run surfacing material on the typical unpaved County road.

It is beyond the scope of this analysis to determine if airborne dust contributes to human health concerns. Deicing salts dusting off a road are considered to be more of a concern than regular mineral dust. However, deicing salts are not a concern, since the Forest Service and Counties in east Texas do not use deicing salts. The use of deicing salt is usually reserved for highway bridges, but the State seldom has occasion to use deicing salts in east Texas.

4.1.14 Unroaded Recreation (UR)

UR (1): Is there now or will there be in the future excess supply or excess demand for unroaded recreation opportunities?

The Big Slough Wilderness Area is the only unroaded area on the Davy Crockett NF. Since such a small proportion of the State is public land, there is demand for and a diversity of opinions on how the public land should be used. Overall, there is an excess demand for all recreation opportunities in the State, including unroaded recreation. However, in the rural area of the Davy Crockett NF with a low rural population, there is probably an excess supply of unroaded recreation opportunities at this time. This can change in the future as the population increases.

UR (2): Is developing new roads into unroaded areas, decommissioning of existing roads, or changing the maintenance of existing roads causing substantial changes in the quantity, quality, or type of unroaded recreation opportunities?

This is not an issue. The Davy Crockett NF does not have any inventoried unroaded areas other than the Big Slough Wilderness.

UR (3): What are the adverse effects of noise and other disturbance caused by developing, using, and maintaining roads, on the quantity, quality, and type of unroaded recreation opportunities?

Since the Big Slough Wilderness Area is the only unroaded area on the Davy Crockett NF, the adverse effects are minimal. Almost all unroaded recreation activities occur in the wilderness area. There is a diverse opinion on what constitutes an acceptable mix of roaded and unroaded recreation opportunities. Closing nearby roads may reduce the amount of noise and provide more opportunities for solitude, but most of the roads provide access to private lands and can not be closed. Closing roads may also reduce opportunities for people to access places on the forest to recreate.

UR (4): Who participates in unroaded recreation in the areas affected by building, maintaining, and decommissioning roads?

There are no unroaded areas on the Davy Crockett NF other than the Big Slough Wilderness Area.

Hikers and hunters utilize the wilderness area for unroaded recreation. The 4C Hiking Trail passes through the wilderness area.

UR (5): What are these participants' attachments to the area, how strong are their feelings, and are alternative opportunities and locations available?

There is a mixed public understanding of what wilderness is. Many users just view the Big Slough Wilderness Area as a place to hike or hunt and don't understand the wilderness designation. Other users understand what wilderness is and are seeking some form of solitude. There are other wilderness areas on the Angelina, Sabine and Sam Houston National Forests, as well as nearby wilderness areas in the State of Louisiana on the Kisatchie National Forest. Other federal lands without roads exist in the western part of the State of Texas. Most users have strong feelings about the areas they frequent and, although alternative locations exist, would be hesitant to change.

4.1.15 Roaded Recreation (RR)

RR (1): Is there now or will there be in the future excess supply or excess demand for road-related recreation opportunities?

The current forest roads system is utilized by a variety of recreation users to access campgrounds, trailheads, dispersed areas and designated hunter camps. Hunting is a popular recreation activity on the Davy Crockett NF. Due to a recent requirement that forest visitors camp at designated hunter camps during the hunting season, hunters are trying to drive large recreational vehicles down lower standard roads. In many areas, the forest roads system provides access to recreation opportunities on the forest, but the roads are not used for road-related recreation. However, there are many scenic drives throughout the Davy Crockett NF. Driving is especially popular during the spring while dogwood (*Cornus florida*) and redbud (*Cercis canadensis*) are in bloom and the fall when the hardwoods change color.

Since only a small proportion of the State is public land, there is demand for and a diversity of opinions on how public land should be used. The demand for all types of recreation, motorized and nonmotorized, is increasing. Overall, there is an excess demand for all recreation opportunities in the State, including road-related recreation. But, due to the rural location of the Davy Crockett NF and the distance to urban population centers there is probably an excess supply for all recreation opportunities at this time. This may change in the future as the population increases.

RR (2): Is developing new roads into unroaded areas, decommissioning of existing roads, or changing the maintenance of existing roads causing substantial changes in the quantity, quality, or type of road-related recreation opportunities?

There are no inventoried unroaded areas on the Davy Crockett NF.

The current road maintenance activities associated with the Maintenance Level 3, 4, and 5 Forest Service roads on the Davy Crockett National Forest have not caused substantial changes in road-related recreation opportunities.

RR (3): What are the adverse effects of noise and other disturbance caused by developing, using, and maintaining roads, on the quantity, quality, and type of roaded recreation opportunities?

Most people dependent on roads for recreation accept the roadside noise and disturbance associated with road use. However, diverse public opinions exist on whether access should be provided for recreation opportunities or restricted for solitude. The Davy Crockett NF, like the other National Forests in Texas, has a scattered land ownership pattern with numerous residences intermingled among national forest lands. Due to the rural location of the Davy Crockett NF and the distance to urban population centers, most users are local residents who prefer access to solitude. This may change in the future as the population increases.

RR (4): Who participates in road-related recreation in the areas affected by building, maintaining, and decommissioning roads?

The forest roads system on the Davy Crockett NF provides access to a variety of recreation participants. Many of these participants are not seeking road-related recreation opportunities, but utilize the forest roads system to access places on the forest. The roads serve as access to developed recreation areas, designated hunter camps, wilderness trailheads, and non-wilderness trailheads. Many people utilize the forest roads system to access dispersed camping and hunting areas. A wide variety of forest products are gathered for recreation and commercial purposes.

The Piney Creek Horse Trail and the 4C Hiking Trail are unique facilities on the Davy Crockett NF and are a focal point attracting forest visitors from urban areas.

While the local rural residents are the primary users of recreation resources on the forest, particularly for dispersed recreation activities such as hunting and fishing, more forest visitors from urban areas are attracted to the forest every year. The central location of the Davy Crockett NF on State highways between the Houston and the Dallas-Ft. Worth urban areas makes the forest more accessible.

RR (5): What are these participants' attachments to the area, how strong are their feelings, and are alternative opportunities and locations available?

People who utilize the forest roads system have strong feelings about their right to access public lands. Major roads that access developed recreation areas are critical to the recreation program and will be managed to provide for public safety as use increases. In most cases, the less used "back roads" provide the greatest interest and contention from participants in road-related recreation opportunities.

At the forest scale, road-related recreation users have strong feelings for roads.

It will be easier to identify public attachments to specific roads at the project-scale. This issue should be addressed during project-scale analyses if the issue arises during scoping.

4.1.16 Passive-Use Value (PV)

PV (1): Do areas planned for road building, closure, or decommissioning have unique physical or biological characteristics, such as unique natural features and threatened or endangered species (see TW 4)?

Few new roads need to be developed. All arterial and collector roads are already in place. Most of these arterial and collector roads are under State or County jurisdiction and are open to public motorized traffic at all times. Most of the Forest Service roads (ML-3, 4, and 5) addressed in this analysis are already in place. We anticipate that future Forest Service road development will be associated with local or spur roads (ML-1 and 2) addressed in subsequent project-scale analysis.

Specific proposals to construct new roads or to close and decommission existing roads will be addressed during project-level analyses. The analysis will address unique physical or biological characteristics if those are issues.

Any new roads will be analyzed for impacts to protected, endangered, threatened and sensitive species. The *Final Environmental Impact Statement (FEIS) for the Management of the Red-cockaded Woodpecker (RCW) and its Habitat on National Forests in the Southern Region* (RCW FEIS) does not permit new roads within one-fourth mile of active RCW clusters where the Davy Crockett NF is managed under Management Intensity Level 3 or 4 guidelines.

The effects on passive-use values should be addressed during project-level analyses if the issue arises in scoping.

PV (2): Do areas planned for road building, closure, or decommissioning have unique cultural, traditional, symbolic, sacred, spiritual, or religious significance?

Determinations of cultural, traditional, symbolic, spiritual, or religious significance will be made during project-scale analyses after identification of and consultation with user groups who may attach such significance to areas to be affected by road building, closure or decommissioning.

This especially applies to sovereign tribal groups who have an ancestral claim to the lands to be affected by a decision to build, close, or decommission roads.

PV (3): What, if any, groups of people (ethnic groups, subcultures, and so on) hold cultural, symbolic, spiritual, sacred, traditional, or religious values for areas planned for road entry or road closure?

This is difficult to determine at the forest-scale and should be addressed during project-scale analyses if the issue arises in scoping. Such groups would include, but not be limited to, rural churches, residents of unincorporated communities (who are often members of a large extended family), and Tribal groups for whom the subject areas may constitute an ancestral homeland.

PV (4): Will building, closing, or decommissioning roads substantially affect passive-use value?

Few new roads need to be developed. All arterial and collector roads are already in place. Most of these arterial and collector roads are under State or County jurisdiction and are open to public motorized traffic at all times. Most of the Forest Service roads (ML-3, 4, and 5) addressed in this analysis are already in place. We anticipate that future Forest Service road development will be associated with local or spur roads (ML-1 and 2) addressed in subsequent project-scale analysis.

The effects of building, closing, or decommissioning a road on passive-use values is best addressed during project-scale analyses if the issue arises during scoping.

4.1.17 Social Issues (SI)

SI (1) and SI (2): What are people's perceived needs and values for roads? How does road management affect people's dependence on, need for, and desire for roads?

Roads provide public access. To be enjoyed and appreciated by forest visitors, the national forest lands must be accessible. Many of the State and County roads that provide access to national forest lands also provide access for residents to communities where they live, work and purchase goods and services.

How road management affects people's dependence on, need for, and desire for roads was addressed during land management planning when the desired condition for access in management areas was established during revision of the *Plan*.

Public attitudes toward the national forest lands and roads on national forest lands are diverse and often contentious. In general, the local rural residents oppose road closures and urban residents promote road closures.

Many people, particularly local residents, seem to have strong feelings of entitlement about using roads on the Davy Crockett NF. Some people believe that the use of these roads causes little environmental damage. Another common sentiment is that closing or eliminating roads would deny the public full use and enjoyment of public lands

In contrast, comments received from urban areas are different. Many comments from urban areas focus on the perceived environmental damage caused by roads, such as road kills, destruction of wildlife habitat, habitat fragmentation, introduction and dispersal of exotic plant and animal species, soil erosion, sedimentation, and harm to fisheries.

SI(3): How does the road system affect access to paleontological, archaeological, and historical sites?

This question deals with the ease or difficulty of getting to the particular sites. Certainly, an improved road system can improve access to paleontological, archeological and historical sites. Whether this access affects a site positively or negatively depends on the effectiveness of site protection measures used.

At this time, there are no known sites with access issues. Most sites have adequate road or trail access.

SI(4): How does the road system affect cultural and traditional uses (such as plant gathering, and access to traditional and cultural sites) and American Indian treaty rights?

There are no known American Indian treaty rights on the Davy Crockett NF. However, federally recognized tribes have a sovereign right to access sites of traditional, spiritual, and cultural importance on their ancestral homelands. This includes access to areas for the purpose of gathering resources necessary for the conduct of religious or cultural practices. Very few places on the national forest are less than a mile from a public open road. However, we often gate local roads; therefore, people may need to walk to reach their favorite areas for hunting, mushroom picking, and other traditional uses. Any decisions concerning the closure, decommissioning, or obliteration of roads on the Davy Crockett NF can occur only after consultation and agreement with the appropriate federally recognized tribe regarding their sovereign rights to access their ancestral homelands.

This issue should be addressed during project-scale analyses if the issue arises during scoping.

SI (5): How are roads that constitute historic sites affected by road management?

The El Camino Real National Historic Trail follows the route of State Highway 21 through the northwestern portion of the Davy Crockett NF. Maintenance of this road right-of-way is the responsibility of the TXDOT. The National Park Service and TXDOT are responsible for managing this travel route in accordance with their agreements. There are other roads on the forest that generally follow the routes of early 20th century logging railroads; however, they are generally not treated as historic sites if there has been continuous use as a road since the abandonment of the logging railroads in the 1930s.

SI (6) and SI (7): How is the social and economic health of communities affected by road management and management of unroaded areas (for example, lifestyles, businesses, tourism industry, infrastructure maintenance)?

A legacy of historical factors, including the corporate logging operations in the early 1900s and the economic depression of the 1930s, partially explains why the Davy Crockett NF was established, why it has a scattered ownership, and what socioeconomic and cultural factors shaped the local communities.

Across east Texas, access to public lands is important to lifestyles. These lifestyles include work activities such as logging and recreation activities such as camping, hunting, horseback riding, and fishing.

The economic composition of the local communities depends on a well-managed public roads system. We believe the existing arterial and collector roads under State, County, and Forest Service jurisdiction provide an adequate road system to support most public needs.

However, the management of specific Forest Service roads, if any, that provide access to communities and businesses should be addressed during project-scale analyses if the issue arises.

There are no inventoried unroaded areas on the Davy Crockett NF.

SI(8): How does road management affect wilderness attributes, including natural integrity, natural appearance, opportunities for solitude, and opportunities for primitive recreation?

Due to the relatively small size of the Big Slough Wilderness and the proximity of public roads around the perimeter of the wilderness area, it is difficult to totally escape all road noise. Most wilderness users are hunters who use the roads and are not bothered by the minor road noises. However, hikers who use the 4C Hiking Trail may be more sensitive to road noises.

SI (9): What are traditional uses of animal and plant species in the area of analysis?

This should be addressed during project-scale analyses if the issue arises during scoping.

SI (10): How does road management affect people's sense of place?

This question relates to specific locations on the forest. These places can be identified by the public as to their location and what it is about the specific location that provides an attachment.

“Sense of place” describes the character of an area and the significance people attach to it. It integrates the sense of a geographic place, considering the biophysical setting, psychological influences (memory, choice, perception, imagination, emotion), and social and cultural influences. Changes in road management can affect access to these places or change the biophysical setting, affecting their attachment or “sense of place”.

We have not identified any place where this is an issue.

4.1.18 Civil Rights and Environmental Justice (CR)

CR(1): How does the road system, or its management, affect certain groups of people (minority, ethnic, cultural, racial, disabled, and low-income groups)?

Usually environmental justice is not an issue unless the percent of the minority population or low-income population exceeds twice the state average. Based on the 2000 U.S. Census Data, Texas has 47.6 percent minority¹ and 15.4 percent low-income² populations. The two counties (Houston and Trinity) comprising the Davy Crockett NF have less than twice the State averages.

See Table 17 below for the percentage of “minority” and “low-income” populations in the counties.

¹ Minority is other than “white persons, not of Hispanic or Latino origin”.

² Below poverty level.

Table 17. Percentages of Minority and Low-Income Populations (DCNF)

	Percent Minority	Percent Low-Income
State of Texas	47.6%	15.4%
Houston Co.	36.3%	21.0%
Trinity Co.	18.1%	17.6%

This demographic information indicates that these counties do not meet the criteria to trigger environmental justice issues. Therefore, we believe the road system has no more or no less affect on certain groups of people than on other groups of people. All groups of people use the road system. Changes in road management such as closing or decommissioning any of the roads would have the same effect on all people including minorities and different cultures.

4.2 Other Questions

5.2.1 Does the existing system of roads create an unacceptable risk to ecosystem sustainability?

Most of the existing system of forest roads addressed in this analysis already existed before national forest lands were purchased and most of those forest roads are State or County roads that the Forest Service has no jurisdiction over – regardless of whether the roads create an unacceptable risk to ecosystem sustainability. However, the Forest Service does have coop agreements with Counties that can be used to remedy any risks to ecosystem sustainability created by County roads.

The existing ML-3, 4, and 5 Forest Service roads addressed in this analysis do not present an unacceptable risk to ecosystem sustainability. However, there are documented cases where specific sites on roads present risks that should be remedied. The highest risk areas are in the vicinity of road stream crossings where sedimentation and fish passage are of concern. See Appendix J *Assessment of Road Impacts on Streams* for more information.

5.2.2 Are there opportunities to reconstruct, relocate, close, or decommission roads on the forest roads system to solve problems or be more consistent with *Plan* direction?

Most of the ML 3, 4 and 5 FS roads on the Davy Crockett NF are consistent with *Plan* direction. However, some of the roads do not meet the following *Plan* Standards and Guidelines:

- FW-053: Design and construct roads and trails to minimize siltation and maintain to provide surface drainage away from streams and into vegetated buffer strips or other filtering system.
- FW-055: Provide road and trail design and construction that allows unrestricted fish passage.
- FW-057: Maintain Forest Development Roads to appropriate maintenance level standards for the planned use and traffic.

Some stream crossing structures that cause stream channel erosion or restrict fish passage have been identified. See Appendix J *Assessment of Road Impacts on Streams* for more information.

There are also State and County roads on the forest roads system that do not meet the *Plan* Standards and Guidelines. There are opportunities to use cooperative agreements to improve those roads. These road improvement opportunities will be identified and addressed during project-scale analyses.

There are ML-1 and ML-2 Forest Service roads that do not meet the current *Plan* direction. Some ML-1 and 2 roads may not meet the following *Plan* Standards and Guidelines.

- FW-058: Obliterate existing roads not needed for current or future use and have vegetative cover reestablished on all disturbed areas.

ML-1 and ML-2 Forest Service roads, as well as unclassified roads, will be reviewed and issues addressed during more site specific project-scale analyses to determine which roads are needed for current and future access.

5.2.3 Can the maintenance requirements of the existing forest roads system be met with current and projected budgets?

Generally, FS road maintenance budgets on the NFGT are inadequate. The road maintenance funds available are only approximately 20 percent of the amounts needed.

Between 1999 and 2002, the NFGT conducted road condition surveys on the ML 3, 4, and 5 FS roads to determine annual and deferred maintenance needs based on existing conditions.

Approximately \$0.9 million dollars are needed annually to fully maintain the ML-3, 4, and 5 FS roads based on the condition surveys conducted. This is the average annual funding needed to maintain the roads at the “objective” maintenance level, not at the current “operational” maintenance level. See the Appendix L *Glossary* for an explanation of terms. The costs include road maintenance activities such as surface blading, ditch cleaning, culvert cleaning, road surfacing repair and replacement, signing, vegetation removal, hazard tree removal, down tree removal, and road closure device repair. The costs also include other direct project costs, such as project management, contracting, and contract administration, and other indirect project costs.

Approximately \$7.7 million is needed to complete the backlog of deferred maintenance to bring the ML-3, 4, and 5 Forest Service roads system to a standard that meets the “objective” maintenance levels.

Deferred maintenance is work that can be deferred without loss of road serviceability until such time as the work can be economically or efficiently performed. Deferred maintenance is most often associated with road surfacing replacement and drainage maintenance, followed by roadside brushing and signing maintenance for public safety. Based on the recent condition surveys, Forest Service roads have culverts to be replaced, culverts to be cleaned, and ditches to be cleaned and reshaped.

The Forest Supervisor and District Ranger have authority to take different actions to deal with inadequate road maintenance budgets, such as reprogramming funds, entering cost-sharing agreements, transferring roads to other public agencies with adequate road maintenance resources, reducing road maintenance levels, closing or decommissioning roads, etc.

5.2.4 Are there opportunities to change road maintenance practices to provide for public safety or better care for natural resources?

It is desirable to institute a program of road maintenance practices that provide for public safety and protect natural resources. Opportunities to change road maintenance practices to provide for public safety or better care for natural resources will be identified during the review of *Road Management Objectives* for roads. For example, blading ditches with a motor grader disturbs stabilized soils and releases more soils sediment into streams. Such unnecessary blading could be discouraged. Where ditches will not function without periodic motor grader blading, the ditches may be improperly designed or constructed and need reconstruction.

Where identified as an opportunity, this issue will be further addressed during project-scale analyses.

5.2.5 Are there opportunities to change road design standards to provide for public safety or better care for natural resources?

Opportunities to change road design standards to provide for public safety or better care for natural resources will be identified during the development of *Road Management Objectives* for roads.

Establish standard road construction designs, drawings, and specifications to implement the *Plan* FW-053 Standard:

“Design and construct roads... to minimize siltation and maintain to provide surface drainage away from streams and into vegetated buffer strips or other filtering system.”

Consider using silt fencing to prevent sedimentation of streams during road construction work.

Establish standard road construction designs, drawings, and specifications to implement the *Plan* FW-055 Standard:

“Provide road... design and construction that allows unrestricted fish passage.” Culverts should to be designed and installed that will, not change the stream substrate, not increase stream flow velocity to the extent that turbulence creates a cavity at the end of the culvert, and not spread low stream flows to the point that the streams are no longer navigable by fish.”

5.2.6 Are there opportunities to improve County roads on the forest roads system under cooperative agreements?

In 1974, the Forest Service first discussed road maintenance responsibilities with Houston and Trinity Counties. A cooperative agreement concerning road maintenance was proposed. In 1976, the first cooperative agreements were signed by the counties.

The concept of cooperative road maintenance and the existing cooperative agreements need to be emphasized and discussed with County Commissioners. County Commissioners are not always aware of the existing agreements, so the Forest Service needs to periodically inform County Commissioners about the existing cooperative agreements.

Where identified as an opportunity, this issue will be further addressed during project-scale analyses.

5.2.7 Are there opportunities to transfer the jurisdiction of Forest Service roads to the County?

There are roads under the jurisdiction of the Forest Service that are primarily maintained by the County. These roads should be considered for transfer to the appropriate County.

Forest Service roads that provide access to rural communities, residences, or private inholdings; serve as school bus routes or mail routes; or have other features that require regular and emergency maintenance may be more appropriately managed under County jurisdiction by public agencies with adequate road maintenance expertise, personnel, and equipment. Consider transferring those roads to the County or other appropriate public roads agency.

Conveyance of these roads is often facilitated by road improvements, such as resurfacing a road. A County may require a road be paved, such as chip'n'seal pavement, before accepting a road into the County road system.

The conveyance of a road right-of-way to a County should be documented. In Texas, there is little impetus for a County to require documented easements, but the Forest Service has a policy of documenting easements across national forest lands. This has been done in many cases by easement or by permit, but the conveyance of roads is not always documented and is not usually conveyed pursuant to a survey that would describe the right-of-way in terms of acreage conveyed.

See the Table 16 in section 5.2.2 Project-Scale Recommendations and Opportunities in the body of this report for a listing of roads identified during this process.

Where identified as an opportunity, this issue will be further addressed during project-scale analyses.

5.2.8 Should any roads be considered for designation as Forest Highways? Are there opportunities to transfer the jurisdiction of any Forest Service roads to the State?

The FS, FHWA, and TXDOT reviewed and reevaluated the Forest Highway system in 1995. Since the TXDOT budget and personnel have decreased, TXDOT is reluctant to add more roads to the 76,000 mile road system they are responsible for.

Where identified as an opportunity, this issue will be further addressed during project-scale analyses.

5.2.9 Are existing Forest Service roads no longer needed to meet future access needs?

None of the existing ML-3, 4, or 5 Forest Service roads were identified as not needed.

However, these ML-3, 4, and 5 roads, as well as existing ML-1 and 2 roads and unclassified roads, may be identified as no longer needed during project-scale analyses.

5.2.10 Are road improvements or additional roads needed to provide adequate access for forest users, resource management, or protection?

No new ML 3, 4, and 5 FS roads are currently proposed for the Davy Crockett NF, however, if additional roads are proposed in the future, the road proposals will be addressed during project-scale analyses.

The reconstruction of existing ML 3, 4, and 5 Forest Service roads may be required, but those roads would also be identified during project-scale analyses.

5.2.11 Are road right-of-ways needed to provide access to national forest lands for use, management, or protection?

Road right-of-way needs will be identified during more project-scale analyses.

Appendix J. Assessment of Road Impacts on Streams



United States
Department of
Agriculture

Forest
Service

National Forests and
Grasslands in Texas
SO

701 N. First Street
Lufkin, TX 75901
Phone 936-639-8501
TDD# 936-639-8560

File Code:
Route To: 2600

Date: October 29, 2000

Subject: Final Report – Road and Stream Interchange Assessment

To: Ruben Natera and Larry Bonner

This was an interesting project because it changed some of my perspectives about what was going on out on the ground. In the past, we had thought culverts, specifically concrete box culverts, were causing most of our problems with stream-road intersects. However, I found several situations where culverts were working well, but road ditch failures were causing the majority of the problems. Most often it involved a lack of wing ditches, or ditches that were “pulled” directly into creeks, not only eroding stream banks, but jeopardizing culverts, bridges and other investments. The old practice of “pulling ditches” should be reevaluated to see if it really provides any benefit in routine road maintenance. There is rarely a need to break the protective vegetative cover and expose soils to erosion. Pulling ditches increases storm drainage velocities and stress on wing ditches, stream banks and crossing structures.

My other false impression was that Forests with less erosive soils had fewer stream-road problems. I found problems on almost every road and some approached magnitudes that were almost beyond repair. Roads impact resources more than any other projects we do. Some have caused stream downcutting, erosion and soil loss that can never be reversed. Our mission is to fulfill a diversity of uses, with “no net loss” to public resources. We will need to drastically change the way we plan, construct and maintain roads in order to fulfill such a mission. The Engineering shop has increased their awareness and coordinated on aquatic issues, but we have many old problems on the ground and a potential lack of communication with equipment operators and contractors that carry out plans. I was only able to document a small portion of the stream crossing problems and had very minimal coverage of some Forests. However, I hope this report is useful in targeting some of the areas needing improvement and that it stimulates further awareness of the critical need for road and stream management coordination. Some additional case studies and educational materials are included at the back of this package.

Sincerely,

s/ David W. Peterson

DAVE PETERSON
Forest Biologist

The assessment of road stream crossings (October 29, 2000 2600 memo) identified the following problems on the Davy Crockett NF. See attached site descriptions.

- Road: FS 357 Location: Compartment 46
Problem: Construct wingditches and repair stream banks.
- Road: HST 4740 Location: Compartments 50 & 54 Brushy Cr
Problem: Replace railroad car culvert with better stream crossing and associated drainage structures.
- Road: FS 507 Location: Compartment 81 northwest of Mossy Cr
Problem: Replace twin 5' culverts
- Road: FS 524B Location: Compartment 7 Johnson Br (east of FS 524)
Problem: Renovate eroding road ditches
- Road: FS 524 Location: Compartments 6 & 7 Johnson Br (north of FS 524A)
Problem: Stabilize roadside embankments
- Road: FS 524 Location: Compartments 5 & 7 Johnson Br
Problem: Renovate road ditches
- Road: FS 524 Location: Compartment 5 Pine Spring Cr (east of TX 21)
Problem: Renovate road ditches and wingditches
- Road: FS 526 Location: Compartments 7 & 8 Branch of Pine Spring Cr
Problem: Renovate culverts and ditch
- Road: FS 527 Location: Compartments 51 & 78 East Branch of Armstrong Cr
Problem: Renovate road ditches and install wingditches
- Road: FS 527 Location: Compartments 52 & 78 Garrison Cr
Problem: Renovate road ditches and install hay bales or gravel buffers
- Road: FM 358 Location: Compartment 75 Branch of Piney Cr
Problem: High outlet drop-off from double 6 x 6 box culverts prevents fish passage.

STREAM CROSSING ASSESSMENT FORM

Date: 9-13-00

Forest: Davy Crockett

Road: FM 357

Compartment: 46

Structure Location: Second major drain heading southeast across tract.

Problems: Twin 36" concrete culverts are being compromised by road ditch erosion. Outlet shown right and inlet below.

Recommendations: Wingditches need to be installed and buffered. Eroded stream banks need repair.

Cost: \$1,000-3,000



STREAM CROSSING ASSESSMENT FORM

Date: 9-13-00

Forest: Davy Crockett

Road: Houston County 4740

Compartment: 50/54

Structure Location: Brushy Creek

Problems: 7' train car culvert causing stream bank erosion down to parent material (right and below left). 4-5' drop on culvert outlet. Road ditches drain directly in and are badly eroded. New gullies are even forming away from structure (below right).

Recommendations: Structure is corroding through in the ceiling and needs to be replaced with much better design. All ditches, gullies and stream banks need much repair. Wingditches and buffers are also needed.

Cost: \$20,000-30,000



STREAM CROSSING ASSESSMENT FORM

Date: 8-8-00

Forest: Davy Crockett

Road: 507

Compartment: 81

Structure Location: Next branch northwest from Mossy Creek low-water crossing (actually a branch of Piney Creek).

Problems: Twin 5' corrugated pipes with aprons have drops on outlets and are causing channel erosion down and upstream. Road ditch undercutting near creek.

Recommendations: Lots of patching, armoring and baffling. Need to baffle inside culverts and make protective aprons outside on ends.

Cost: \$7500

Pictures:

Inlet – left, Outlet- right



STREAM CROSSING ASSESSMENT FORM

Date: 8-24-00

Forest: Davy Crockett

Road: 524B

Compartment: 7

Structure Location: Johnson Branch
2nd tributary east of 524

Structure Type: Double 6 x 7 concrete box.

Problems: South side road ditch eroding.
Ephemeral drain at southeast quad beginning to head-cut.

Recommendations: Ditches need winging and hay bales, stream bank and head-cut need hay, seed and cattle panel reinforcement. Picture is of bank erosion where road ditch enters. Note old repair with wire mesh.

Cost: \$2,000

Note: Subterranean crayfish burrows in dry creek bottom.



STREAM CROSSING ASSESSMENT FORM

Date: 8-24-00

Forest: Davy Crockett

Road: 524

Compartment: 6/7

Structure Location: Johnson Branch north of 524A

Problems: 24" culvert - road erosion both sides; west side road embankment unstable and erosion prone.

Recommendations: Renovate wings and stabilize embankment with fabric or mess and seeding.

Cost: \$1000-\$2000

STREAM CROSSING ASSESSMENT FORM

Date: 8-24-00

Forest: Davy Crockett

Road: 524

Compartment: 5/7

Structure Location: Johnson Branch

Problems: 7 x 8 twin box working well - bad road ditch erosion east side (see photo), needs maintenance on other side. Very steep road gradient to stream.

Recommendations: Renovate wingditches, buffer with hay and rock baffles in ditches.

Cost: \$1000-\$3,000



STREAM CROSSING ASSESSMENT FORM

Date: 8-24-00

Forest: Davy Crockett

Road: 524

Compartment: 5

Structure Location: Pine Spring Creek just east of intersection with TX 21.

Problems: 1998 "10% Roads" repairs are failing in places, primarily due to road ditch runoff.

Ditch drainage has blown through some wings, displaced hay bales and eroded stream banks (see outlet picture- right). Road ditches are on steep grade and private to west prevents more wing control.

Recommendations: On the southwest side of the intersection, wingditches need to be reworked and the lower one needs to be expanded into a sedimentation basin with a spillway. All wingditches need to be revamped and rock-pile baffles need to be placed in ditches. Additionally, outlet stream banks and spill-zone need to be armored and stabilized.

This is another case where we've lost so much fill from the outlet that we can't build it back up and hold it. Recommend another cleated fish ramp of treated lumber.

Cost: \$15,000 as per Richard Graves- details in attached notes.



STREAM CROSSING ASSESSMENT FORM

Date: 8-24-00

Forest: Davy Crockett

Road: 526

Compartments: 7 & 8

Structure Location: Branch of Pine Spring Cr

Problems: 24" culverts too small – 2'-3' drop at outlet and creek bed blowout. Bad ditch erosion on northeast side.

Recommendations:

Culverts and ditch need reworking, armoring and baffling.

Cost:

\$1000-\$3000



STREAM CROSSING ASSESSMENT FORM

Date: 9-13-00

Forest: Davy Crockett

Road: 527

Compartment: 51 & 78

Structure Location: East Branch Armstrong Cr

Problems: 8 x 8 box has road ditch erosion into stream channel. The northeast quadrant shown right, southeast below.

Recommendations:

Install wingditches. Buffer and patch ditches.

Cost: \$1,000-3,000



STREAM CROSSING ASSESSMENT FORM

Date: 9-13-00

Forest: Davy Crockett

Road: 527

Compartments: 52/78

Structure Location: Garrison Creek crossing.

Stream type/status: Pooled perennial - dry with one small fishless pool.

Problems: 10 x 12 box seems to be working well. Road ditches eroded into channel in northwest (shown) and southwest quadrants.

Recommendations:

Examine wing ditches. Use hay bales or gravel pile to buffer ditches. Repair any erosion.

Cost: \$1,000-3,000



STREAM CROSSING ASSESSMENT FORM

Date: 8-15-00

Forest: Davy Crockett

Road: FM 358

Compartment: 75

Structure: Double 5 x 4 concrete box culverts.

Problems: Very high outlet drop-off and deep eroded pool. Branch of Piney Creek which is designated as R8 Sensitive Sabine Shiner restoration stream. No fish passage.

Recommendations:

Dave Wrobleski and I met with TXDOT and they replaced with longer 6X6 boxes and filled hole, but were resistant to baffling culverts or curbing apron as recommended by the Ouachita NF culvert specialist. Still no fish passage.

Fill hole and roughen/baffle culvert properly to provide for fish passage.

Cost: \$5000-7500



Appendix K. Public Involvement - Letter Soliciting Public Comments



United States
Department of
Agriculture

Forest
Service

National Forests and Grasslands in
Texas
Supervisors Office

701 N. First Street
Lufkin, TX 75901
Phone 936-639-8501
TDD# 936-639-8560

File Code: 1950/7710

Date: January 27, 2003

Dear Concerned Citizen:

We are in the process of analyzing the roads serving each of the National Forests and Grasslands in Texas. Our analysis will include state and county roads as well as Forest Service (FS) roads that are suitable for a passenger car and other public vehicles. This analysis will not include those FS roads that are not maintained for passenger car traffic or are closed to public use.

This analysis will help identify concerns about the current condition of the roads and opportunities to improve the roads that can be considered in a future environmental analysis for proposed projects. However, this analysis will not make any management decisions. This analysis will provide information for management decisions to be made in future site-specific analysis for proposed road improvement projects.

Why are we doing this? The Forest Service has adopted a policy to ensure that decisions to construct, reconstruct, or decommission roads will be based on a roads analysis, and we will be preparing a separate roads analysis for each National Forest and Grasslands in Texas unit. Each forest-level Roads Analysis Process (RAP) will identify opportunities for potential management actions that will be considered in future site-specific analyses.

Each forest-level RAP will provide a review of the public roads that are suitable for a passenger car and other public vehicles. Other roads, those roads that are not maintained for passenger car traffic or are closed to public use, will be addressed in each future project-level RAP developed during the site-specific analyses of proposed projects.

A forest-level RAP does not make National Environmental Policy Act (NEPA) decisions and is not subject to the administrative appeal process under 36 CFR 215; however, a project-level RAP will be developed during the NEPA analysis for site-specific projects and those decisions will be subject to administrative appeal.

During our preliminary analysis of roads serving the National Forests and Grasslands in Texas, we identified the following issues and concerns to be addressed.

- Does the current road system need improvement to adequately serve rural communities and other users of the National Forests and Grasslands?
- Are there FS roads that serve rural communities and provide residential access that should be transferred to the county?
- Are road improvements needed to reduce any adverse effects of roads on water quality and road culverts on fish passage?
- Are road right-of-ways needed to access national forest lands?

If you have concerns or specific comments about the RAP for any of the National Forests and Grasslands in Texas, please submit them by February 21, 2003 to:

Don Benner
Project Analysis Team
701 North First Street
Lufkin, Texas 75901

Comments received in response to this letter, including names and addresses of those who comment, will be considered part of the public record for the analysis and will be available for public inspection. Comments submitted anonymously will also be accepted and considered.

Additionally, pursuant to 7 CFR 1.27(d), any person may request the agency to withhold a submission from the public record by showing how the Freedom of Information Act (FOIA) permits such confidentiality. Persons requesting such confidentiality should be aware that, under the FOIA, confidentiality may be granted in only limited circumstances, such as to protect trade secrets. The Forest Service will inform the requester of the agency's decision regarding the request for confidentiality; and where a request is denied, the agency will return the submission and notify the requester that the comments may be resubmitted with or without name and address within seven days.

Sincerely,

/s/ *Glenn Donnahoe*
GLENN DONNAHOE
Acting Forest Supervisor

Mailing List Used For Letter Soliciting Public Comments

Abhay Anello	Ft. Worth Audubon Society, Ft. Worth, TX
Alan Allen	Sportsmen Conservationists of Texas, Austin, TX
Allen Page	
Allen Sumner	County Commissioner Precinct #4, Huntington, TX
Ann Richey	Cross Timbers Concerned Citizens, Hico, TX
Assistant Attorney General	Environmental Protection Division, Austin, TX
Ayelet Hines	Sierra Club, Austin TX
B.R. Bryan	San Augustine County Commissioner, Precinct #4, San Augustine, TX
Ben Donegan	
Bennie King	
Bill Cook	
Bill Tetley	Nederland Sierra Club, Nederland, TX
Billy L. Curb	USDA Rural Development, Temple, TX
Billy Ray Duren	County Commissioner Precinct #4, Crockett, TX
Bob Baylis	
Bob Becknell	
Bob Bowman	Deep East TX Development Association, Lufkin TX
Bob Currie	Texas Forestry Association, Kennard, TX
Brad Jones	
Brad Shiver	
Brandt Mannchen	Houston Sierra Club, Houston, TX
Buddy Armstrong	
Burl Hughes	
C.H. Starnes	
Cark Watts	Houston County Forest Landowner Association, Ratcliff, TX
Cary D. Kirby	
Cathy Boydston	Texas Parks & Wildlife Department, Austin, TX
CEA County Extension Agent	Huntsville, TX
Charles Becker	
Charles Johnson	
Charles Shofner, Jr.	Jasper County Commissioner Precinct #1, Jasper, TX
Cheryl Prewitt	Sam Houston National Forest
Chester R. Julian	
Chip Ernst	Sam Houston National Forest
Chuck and Kendra Daniel	
Chuck Hunt	Big Thicket National Preserve, Beaumont, TX
Clarence Massey	
Clifton Collins	
Dale Smith	
Dave Stockton	
David Harvey	
David Holzmer	Houston Sierra Club
David Oates	Lufkin Farm Bureau
David Vogelsang	
Dawn Carrie	Sam Houston National Forest
Deborah Levoy	

Deep East Texas Electric Co-op	
Denise S. Francis	Governor's Office of Budget & Planning, Austin, TX
Dennis Fredirich	West Texas Brittany Club, San Angelo, TX
Dennis Wayne	
Derek Green	PBS&J, Austin, TX
Dewayne Strickland	Honey Grove County Commissioner Precinct #3, Honey Grove, TX
Don Dickerson	
Donna Work	Texas Forest Service, Lufkin, TX
Doug York	
Douglas Dvorman	Louisiana Pacific, Silsbee, TX
Doyle Dickerson	Sabine County Commissioner, Precinct #3, Hemphill, TX
Dr. Diana M. Burton	Texas A&M University
Dr. Ed Hiler	Texas Agriculture Extension Ser., Texas A&M, College Station, TX
Dr. Eugene I. Majerowicz	
Dr. James Bruseth	Texas State Historical Commission, Austin, TX
Dr. Michael Legg	Stephen F. Austin State University
Dr. Montague Whiting	SFASU, College of Forestry
Ed and Faye Dykes	
Ed Baron	Texas Forest Service, College Station, TX
Ed Keely	
Eddie Spurgeon	Texas Arabian Distance Riders, Wortham, TX
Edward C. Fritz	Texas Committee on Natural Resources, Dallas, TX
Elizabeth Palmore	
Ellen Buchanan	Martin Dies Jr. State Park, Jasper, TX
Fayne Warner	Sabine County Commissioner, Precinct #4, Hemphill, TX
Forest Supervisor	National Forests in Mississippi
Forest Supervisor	Caribbean National Forest
Foster Kneeland	
Garvis W. Alexander, Jr.	Alexander Forest Service, Silsbee, TX
Gary A. Burns	Burns Forestry, Crockett, TX
Gary Keife	
Gary Powell	Texas Water Development Board, Austin, TX
George & Geannette Crawford	
George Nickas	Wilderness Watch, Missoula, MT
George Russell	Huntsville Sierra Club
Gina Donovan	Texas Committee on Natural Resources, Lufkin, TX
Glenn Donnahoe	Project Analysis Team Leader, NFGT, Lufkin, TX
Glenn Elms	Sam Houston National Forest
Gordon Steele	DETTA Forestry Committee Chairman, Hemphill, TX
Harold D. Smith	
Harry Thompson	Texas Department of Transportation, Lufkin, TX
Honorable Alan B. Sadler	Montague County Judge, Montague, TX
Honorable Bill Law	San Jacinto County Judge, Coldspring, TX
Honorable Chadwick Smith	Principal Chief, Cherokee Nation of Oklahoma
Honorable Charles H. Wagamon	Walker County Judge, Huntsville, TX
Honorable Charles W. Stenholm	U.S. Representative
Honorable Craig Estes	Texas State Senator

Honorable Dallas Proctor	Chief, Cherokee United Keetowah Band, Talequah, OK
Honorable Dan Ellis	Texas State Representative
Honorable Dan Underwood	Mayor of New Waverly, Texas
Honorable David Bernsen	Texas State Senator
Honorable David H. Cain	Texas State Senator
Honorable David Sibley	Texas State Senator
Honorable Derrell Hall	Fannin County Judge, Bonham, TX
Honorable Dick Chase	Wise County Judge, Decatur, TX
Honorable Earl J. Barbry, Sr.	Chairman, Tunica-Biloxi Indians of Louisiana
Honorable Floyd Watson	Shelby County Judge, Center, TX
Honorable Gregory E. Pyle	Chief, Choctaw Nation of Oklahoma
Honorable Jack Leath	Sabine County Judge, Hemphill, TX
Honorable James Kittrell	Montague County Judge, Montague, TX
Honorable Jim McReynolds	Texas State Representative, Austin, TX
Honorable Jim Turner	U.S. Representative
Honorable Joe Adams	San Jacinto County Judge, College Station, TX
Honorable Joe Berry	Angelina County Judge, Lufkin, TX
Honorable Joe N. Folk	Jasper County Judge, Jasper, TX
Honorable Kay Bailey Hutchinson	U.S. Senator
Honorable Kevin Batise	Chairman, Ala-Coushatta Tribal HQ, Livingston, TX
Honorable Kevin Brady	U.S. Representative, Washington, DC
Honorable L.B. McDonald	Wise County Judge, Decatur, TX
Honorable LaRue Parker	Chairman, Caddo Tribe, Binger, OK
Honorable Lovelin Poncho	Chairman, Coushatta Tribe, Elton, Louisiana
Honorable Mark Evans	Trinity County Judge, Groveton, TX
Honorable Mark Homer	Texas State Representative
Honorable Max Sandlin	U.S. Representative
Honorable Phil King	Texas State Representative
Honorable R.C. "Chris" Doenhoff	Houston County Judge, Crockett, TX
Honorable Rick Hardcastle	Texas State Representative
Honorable Rick Perry	Governor of Texas
Honorable Robert D. Pierce II	Walker County Judge, Huntsville, TX
Honorable Ron E. Lewis	Texas State Representative
Honorable Ruben Hope	Texas State Representative
Honorable Steve Ogden	Texas State Senator
Honorable Steve Ogden	Texas State Senator
Honorable Sue Kennedy	Nacogdoches County Judge, Nacogdoches, TX
Honorable Thomas Williams	Texas State Representative
Honorable Todd Staples	Texas State Senator
Honorable Truman Dougharty	Newton County Judge, Newton, TX
Honorable Wayne Christian	Texas State Representative
Honorable Wayne Holt	San Augustine County Judge, San Augustine, TX
Honorable William M. Thornberry	U.S. Representative
Hope Organ	
Ike McWhorter	
J. Michael Godin	Texas Coastal Brittany Club, Garland, TX
J.S. Miller	Texas Department of Transportation, Lufkin, TX
James B. Hull	Texas Forest Service, College Station, TX

James Bruseth	Texas Historical Commission, Austin, TX
James Hill	County Commissioner Precinct #1, Coldspring, TX
James Hines	
James Kittrell	Montague County Judge
James M. Moore	Texas State Soil & Water Conservation Board, Temple, TX
James Reynolds	County Commissioner Precinct #3, Huntsville, TX
James Sandt	
James Scott	Sam Houston National Forest
James T. Davis	Superintendent, Centerville ISD
James Thompson	Steely Lumber Co., Inc., Huntsville, TX
James Woods	
Jane Prentiss	
Jay Garrett	
Jeff Allen	
Jeff Goodson	
Jeff Hardy	
Jeff Hudspeth	
Jeff Sparks	Texas Parks & Wildlife Department, Tyler, TX
Jeffrey Reid	U.S. Fish & Wildlife Service, Lufkin, TX
Jem Bensman	
Jennifer Barrow	Texas Parks & Wildlife Department, Decatur, TX
Jerry McCloud	Houston County Commissioner Precinct #1, Crockett, TX
Jerry Watkins	Ft. Worth Brittany Club
Jerry Watkins	Fort Worth Brittany Club, Aledo, TX
Jim Fredricks	Reporter Conroe Courier, Conroe, TX
Jim R. Alexander	Jack Alexander, Ltd., Silsbee, TX
Jim Wise	Groveton ISD, Groveton, TX
Jimmy Craig	San Augustine County Commissioner, Precinct #3, San Augustine, TX
Joe Johnson	County Commissioner Precinct #4, Point Blank, TX
John & Gloria Tveten	Houston Chronical Nature Columnists, Baytown, TX
John Burke	Texas Parks & Wildlife Department, Nacogdoches, TX
John Burke	
John Metivier	Southeast Texas Off-Road Riders, Bridge City, TX
John Shrivvers	National Wild Turkey Federation, Fort Worth, TX
Joseph A. Pietrocario	
Judy Attaway	
Kathleen Davis	
Keith Baker	Sam Houston National Forest
Keith C. Clark	Sabine County Commissioner, Precinct #1, Hemphill, TX
Keith Sonnier	
Kennum Kellum	Crockett County Commissioner Precinct #4, Crockett, TX
Kevin & Lori Sykes	
Kevin Burns	Decatur County Commissioner Precinct #2, Decatur, TX
Kristen McDonald	Wild & Scenic River Program, Washington, DC
Kyle Stephens	Decatur County Commissioner Precinct #1, Decatur, TX
Larry Bretzlaff	ANCFLA, Zavalla, TX
Larry D. White	Texas A&M University
Larry Shelton	Texas Committee on Natural Resources, Nacogdoches, TX

Leo A. Reitan	
Leon E. Ray	Cal-Tex Lumber Co., Inc., Austin, TX
Leslie Ramirez	
Lindsey Armstrong	
Louie Kee	Southern Cherokee & Associated Bands, New Caney, TX
Loyd Budd	American Brittany Club, Bellevue, TX
Lynn George	County Commissioner Precinct #4, Lufkin, TX
Lynn Smith	Sabine County Commissioner, Precinct #2, Hemphill, TX
M.L. Harris	
Mack Steed	
Mark Belles	SFASU, College of Forestry, Nacogdoches, TX
Mark McClain	
Mary Ann Hodges	
Max Covington	
Mayor William	Mayor of Huntsville, Texas
Melanie Shute	
Meta & Conrad Plevnic	
Mike Buzbee	Gulf Coast Trade Center, New Waverly, TX
Mike Meador	County Commissioner Precinct #1, Willis, TX
Mike Meeker	Fun Country 4-Wheeler, Nederland, TX
Mike Messina	Department of Forest Science, Texas A&M University
Mike Pirtle	Pirtle Farm & Kennel, Alvord, TX
Mike Rogers	
Mike Ross	Ross Lumber Company, Timpson, TX
Mike S. Dunigan	
Nancy Lynch	General Environmental Protection Division, Austin, TX
Nat'l Assoc of RV Parks & Campground Owners	Falls Church, VA
Nikii McDonald	
North Texas Weimaraner Point Dogs	
Pat Hilliard	Bonham County Commissioner Precinct #4, Bonham, TX
Pat Parker	
Patricia Faulkner	Louisiana Natural Heritage Program, Baton Rouge, LA
Paul DuFour	Sam Houston National Forest
Paul Wollitz	
Prentis L. Hopson	Newton County Commissioner, Precinct #3, Burkeville, TX
Randy Prewitt	Sam Houston National Forest
Randy Rice	Cal-Tex Lumber Co., Inc., Nacogdoches, TX
Ray Hooper	Southeast TX Off-Road Riders, Beaumont, TX
Ray Wooley	
Richard Johnson	
Richard M. Donovan	Texas Committee on Natural Resources, Lufkin, TX
Rick Turner	The Nature Conservancy, Nacogdoches, TX
Ricky Maxey	Texas Parks & Wildlife Department, Nacogdoches, TX
Robert Cast	Historic Officer, Caddo Tribe Chairperson, Binger, OK
Robert Betake or Rita Dodson	Ritzy Arabians, Inc., Alvord, TX
Robert Earl Artery	County Commissioner Precinct #2, Huntsville, TX
Robert M. Plot	
Robert Ferret	

Robert W. Spain	Texas Parks & Wildlife Department, Austin, TX
Romaic Brooks	Paola College Library, Carthage, TX
Ronald Basher	
Ronnie Ross	
S.L. Simons, Jr.	
Sam Houston Forest Estates	Huntsville Homeowners Association, Huntsville, TX
Scott D. Smith	
Scott Stallings	
Scott Williams	
Sonny Ellis	
Sonny Thornton	
Southern Forest Experiment Station	
Stacey Haitian	Gulf Coast Limestone, Seabrook, TX
Steven McBride	
Steven Springer	
Susan Cabby-Horton	League of Women Voter of Texas, Belton, TX
Susan Chinked	
Tab Smith	
Ted E. Ryan	Trail Riders of Houston, Friendswood, TX
Terry Austin	Executive Director, Audubon of Texas, Austin, TX
Terry Carter	Alamo Brittany Club, San Antonio, TX
Texas Forestry Association	
Thomas Bonds	County Commissioner Precinct #3, Cleveland, TX
Tim Paulsen	Huntsville Co. Commissioner Precinct #4, Huntsville, TX
Tim Portola	Friends of NE Texas Archaeology, Austin, TX
Tim Ten dell	Temple-Inland, Nacogdoches, TX
Tom Gross	President, Prairie & Timbers Audubon Society, McKinney, TX
Tom Strickland	Nacogdoches County Commissioner Precinct #4, Nacogdoches, TX
Tommy Hunter	San Augustine County Commissioner, Precinct #2, San Augustine, TX
Trail Riders of Houston	
Travis Forest	Apple Springs County Commissioner Precinct #4, Apple Springs, TX
Travis Rogers	Shelby County Commissioner, Precinct #3, Center, TX
Trinity Valley Vila Pointer Dogs	Southlake, TX
US Fish & Wildlife Service	Arlington, TX
Walter Kings borough	Sam Houston National Forest
Wayne Huggins	
Wayne Ramsey	
Weldon K. Gaston	Texas Department of Transportation, Lufkin, TX
Wendell A. With row	Attorney at Law, Carrollton, TX
Wendy J. Ledbetter	The Nature Conservancy, Silsbee, TX
Wendy J. Ledbetter	East Texas Land Steward, Silsbee, TX
Wes Christensen	Koch Industries, OK
Wiley Beal	Texas Forest Watch, Fair Oaks Ranch, TX
Willie Kitchen	Houston Co. Commissioner Precinct #2, Crockett, TX

Public Comments

SIERRA
CLUB



Houston Regional Group
P.O. Box 3021
Houston, Texas 77253-3021
713/895-9309

February 17, 2003

Mr. Don Benner
Project Analysis Team
National Forests and Grasslands in Texas
701 North First Street
Lufkin, Texas 75901

RECEIVED

FEB 20 2003

Dear Mr. Benner,

Enclosed are the comments of the Houston Sierra Club (HSC) regarding the Roads Analysis (RAP) for the National Forests and Grasslands in Texas (NFGT). We request that the HSC receive all notices or other information about the RAP.

The RAP it will cover the developed and higher level roads in the Forest Service (FS) Road System Inventory that are maintained for car travel including federal roads, state roads, county roads, and FS Level 3, 4, and 5 roads that are maintained for public vehicles.

The HSC is concerned that the public has been given too little time to comment on this important issue. The date of the scoping notice is January 27, 2003 and the date comments are due is February 21, 2003. The public has only three weeks to respond to this letter. We request that in the future the FS provide the public with an adequate public notice, review, and comment period of 30-45 days.

The HSC is concerned that the RAP emphasizes a very small subset of issues and concerns. The issues and concerns emphasized in the January 27, 2003 scoping letter include:

- 1) Whether the current road system needs to be improved.
- 2) Whether the current road system adequately serves rural communities.
- 3) Whether the current road system adequately serves other users of the NFGT.
- 4) Whether FS roads that serve rural communities and provide residential access should be transferred to the county.
- 5) Whether road right-of-ways are needed to access the NFGT.

"When we try to pick out anything by itself, we find it hitched to everything else in the universe." *John Muir*

Recycled paper

6) Whether there are road improvements that need to be made to reduce adverse effects of roads on water quality.

7) Whether there are improvements needed to reduce adverse effects of road culverts on fish passage.

Except for the last two issues/concerns the focus of the RAP appears to be on improving/increasing road numbers/levels of development rather than protecting forest ecosystems. There are many other issues/concerns that need to be addressed. Some of these include:

1) Are there any federal roads, state roads, county roads, and FS Level 3, 4, and 5 roads in the road system being analyzed in the NFGT that should be closed, decommissioned, or obliterated?

2) What is the current level of road kill for the federal roads, state roads, county roads, and FS Level 3, 4, and 5 roads that are in the road system being analyzed in the NFGT?

3) What species are being killed and what impact is this having on the population and the trend of the population for each of these species for federal roads, state roads county roads, and FS Level 3, 4, and 5 roads that are in the road system being analyzed in the NFGT? How can these impacts be eliminated or minimized?

4) The Southern Research Station has documented that Louisiana Pine Snakes and Canebrake Rattlesnakes are affected by road densities and road kill. Both of these snakes are considered sensitive species in the 1996 NFGT Forest Plan. Are there any federal roads, state roads, county roads, and FS Level 3, 4, and 5 roads in the road system being analyzed in the NFGT that are causing road kill of these species? How can these impacts be eliminated or minimized?

5) Are there any federal roads, state roads, county roads, and FS Level 3, 4, and 5 roads that are in the road system being analyzed in the NFGT that should be closed or whose use should in other ways be altered due to road kill of Louisiana Pine Snakes and Canebrake Rattlesnakes?

6) Are there any federal roads, state roads, county roads, and FS Level 3, 4, and 5 roads that are in the road system being analyzed in the NFGT that are causing fragmentation of plant/animal species habitats?

7) Are there any federal roads, state roads, county roads, and FS Level 3, 4, and 5 roads that are being impacted by urban sprawl? How can these impacts be mitigated?

8) Are there any federal roads, state roads, county roads, and FS Level 3, 4, and 5 roads that are being impacted by incompatible land uses? How can these impacts be mitigated?

9) Are there any state, county, and FS roads that are causing invasive plant or animal spread? How can these impacts be mitigated?

10) Are there any federal roads, state roads, county roads, and FS Level 3, 4, and 5 roads that are causing environmental impacts that should be mitigated? How can these impacts be mitigated?

11) Are there any federal roads, state roads, county roads, and FS Level 3, 4, and 5 roads whose scenic, aesthetic, and environmental values are threatened by the RAP or other proposed improvements? How can these impacts be mitigated?

12) Mitigation should be required for existing and future roads or road improvements. Mitigation should include culverts or similar devices designed specifically to allow passage of wildlife.

13) What is the road density in the NFGT?

14) What part of the road density is caused by federal roads, state roads, county roads, and FS Level 2, 4, and 5 roads that are in the road system being analyzed in the NFGT.

15) How do present federal roads, state roads, county roads, and FS Level 3, 4, and 5 roads that are in the road system being analyzed in the NFGT affect wildness, wilderness, quiet, natural sounds, and solitude? How can these impacts be mitigated?

16) What are the current economic costs of federal roads, state roads, county roads, and FS Level 3, 4, and 5 roads that are in the road system being analyzed in the NFGT? What is the current backlog of maintenance costs for these roads?

The HSC believes that the NFGT have more than enough roads to support all uses. We do not support turning any FS roads over to the county for maintenance or for any other purpose. We support the FS regaining control over as many of the public's roads and as much of its lands as possible whether these be federal, state, county, or municipal.

The HSC is very concerned about the pressure that these entities are putting on the FS. Examples include Walker County pressuring the FS to allow the clearing of numerous trees from the right-of-way and seeking more right-of-way to allow developers to more easily sell their properties along and near Walker County 2 (Forest Road 215). The Texas Department of Texas (TxDOT) has proposed the widening of FM 1375, one of the most scenic roads in the entire NFGT. There are an increasing number of requests by adjacent property owners to allow access by roads to their lands through Sam Houston National Forest (SHNF). FM 2025, coming out of Cleveland, Texas, has just been improved by widening shoulders.

The HSC wants the FS to examine carefully how roads affect the NFGT how. How can a road system intelligently be engineered to protect important ecosystems and wildlife while allowing compatible uses of the NFGT. How can wildness, wilderness, solitude,

quiet, natural sounds, contemplation, and other disappearing uses be protected, conserved, and preserved without the total mechanization of the NFGT.

There is a real opportunity to change the way the NFGT is managed. But continuing to construct, improve, and increase roads and road density will continue to cost the taxpayers more and more money to maintain the roads and in degraded natural resources.

We appreciate this opportunity to comment. Thank you.

Sincerely,



Brandt Mannchen
Chair, Forestry Subcommittee
Houston Sierra Club
Lone Star Chapter
5431 Carew
Houston, Texas 77096
H713-664-5962, W713-640-4313



U. S. Department
of Transportation

**Federal Highway
Administration**

Eastern Federal Lands
Highway Division

21400 Ridgetop Circle
Sterling, VA 20166-6511

FEB 26 2003

Refer to: HFPP-15

Mr. Fred Salinas
Forest Supervisor
U.S. Forest Service
701 North 1st Street
Lufkin, TX 75901

Dear Mr. Salinas:

In accordance with the request of Mr. George Willard, enclosed are the following:

1. a CD-ROM containing maps and descriptive data on the designated Forest Highways in Texas and
2. a report, "History of Forest Highway Projects in State of Texas," detailing projects funded by the Forest Highway program.

Thank you for your participation in the Forest Highway Program. If you need more information or have a recommendation, please contact Mr. Walter Juraszek, Highway Engineer, at 571-434-1561, or Ms. Peggy DeWeese, Forest Highway and State Programs Manager, at 703-404-6290.

Sincerely yours,

Alan T. Teikari
Planning and Programming Engineer

Enclosures

cc:

Mr. George Willard, National Forests and Grasslands in Texas, Lufkin, TX with copy of enclosures



FEDERAL HIGHWAY ADMINISTRATION
 EASTERN FEDERAL LANDS HIGHWAY DIVISION
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FH 87			
PROJECT NO. TX FH 2001(591)	PROJECT FUNDING	FEDERAL FUNDS	TOTAL FUNDS
ADMIN BY: STATE; STATE PROJ NO: 0064-15-002	FOREST HIGHWAY	\$3,675,174.00	\$3,675,174.00
PROJECT STATUS / ? PERCENT COMPLETE 09/10/1901 PER PR-2 DTD 07/03/1901	SURFACE TRANSP.	\$0.00	\$0.00
PROJECT SCOPE RECONSTRUCT ROADWAY, INCLUDING 0 BRIDGE(S), ON 6.437 KM OF FDR 117 (FH 87) 3.52 MILES EAST OF US ROUTE TO 7.52 MILES EAST, SABINE NATIONAL FOREST, SABINE COUNTY, TEXAS	BRIDGE REPLACEMENT	\$0.00	\$0.00
	PUBLIC LANDS DISC.	\$0.00	\$0.00
	OTHER TITLE 23 PROG	\$0.00	\$0.00
	PROGRAM:		
	OTHER STATE FUNDS	\$0.00	\$0.00
	OTHER LOCAL FUNDS	\$0.00	\$0.00
	NON-TITLE 23 FEDERAL	\$0.00	\$0.00
	TOTALS	\$3,675,174.00	\$3,675,174.00
FOREST HIGHWAY 101			
PROJECT NO. TX PFH 101(1)	PROJECT FUNDING	FEDERAL FUNDS	TOTAL FUNDS
ADMIN BY: STATE; STATE PROJ NO: 0911-39-010	FOREST HIGHWAY	\$289,129.09	\$289,129.09
PROJECT STATUS CLOSED / 100 PERCENT COMPLETE 08/01/1996 PER DAFIS REPORT DTD 07/16/1997	SURFACE TRANSP.	\$0.00	\$0.00
PROJECT SCOPE REPLACE BRIDGE AND APPROACH WORK, INCLUDING 1 BRIDGE(S), ON 0.000 KM OF FORMER FDR 126 (FOREST HIGHWAY 101) BRIDGE OVER BRITAIN CREEK, SABINE NATIONAL FOREST, SHELBY COUNTY, TEXAS	BRIDGE REPLACEMENT	\$0.00	\$0.00
	PUBLIC LANDS DISC.	\$0.00	\$0.00
	OTHER TITLE 23 PROG	\$0.00	\$0.00
	PROGRAM:		
	OTHER STATE FUNDS	\$0.00	\$0.00
	OTHER LOCAL FUNDS	\$0.00	\$0.00
	NON-TITLE 23 FEDERAL	\$0.00	\$0.00
	TOTALS	\$289,129.09	\$289,129.09
FOREST HIGHWAY 15			
PROJECT NO. TX FH 15-1(1)	PROJECT FUNDING	FEDERAL FUNDS	TOTAL FUNDS
ADMIN BY: STATE; STATE PROJ NO: N/A	FOREST HIGHWAY	\$863,406.50	\$863,406.50
PROJECT STATUS CLOSED / 100 PERCENT COMPLETE 03/01/1986 PER FMIS DTD 09/30/1995	SURFACE TRANSP.	\$0.00	\$0.00
PROJECT SCOPE GRADING, BASE & SURFACING, INCLUDING 0 BRIDGE(S), ON 7.360 KM OF FM 2029 (FOREST HIGHWAY 15) 1.5 MI EAST OF TELEPHONE EAST 4.6 MI, CADDO NATIONAL GRASSLANDS, FANNIN COUNTY, TEXAS	BRIDGE REPLACEMENT	\$0.00	\$0.00
	PUBLIC LANDS DISC.	\$0.00	\$0.00
	OTHER TITLE 23 PROG	\$0.00	\$0.00
	PROGRAM:		
	OTHER STATE FUNDS	\$0.00	\$0.00
	OTHER LOCAL FUNDS	\$0.00	\$0.00
	NON-TITLE 23 FEDERAL	\$0.00	\$0.00
	TOTALS	\$863,406.50	\$863,406.50
FOREST HIGHWAY 15			
PROJECT NO. TX FHL 15-1(2)	PROJECT FUNDING	FEDERAL FUNDS	TOTAL FUNDS
ADMIN BY: STATE; STATE PROJ NO: 2945-01-004	FOREST HIGHWAY	\$1,105,088.60	\$1,105,090.00
PROJECT STATUS CLOSED / 100 PERCENT COMPLETE 07/01/1990 PER FMIS DTD 09/30/1995	SURFACE TRANSP.	\$0.00	\$0.00
PROJECT SCOPE GRADING, BASE & SURFACING, INCLUDING 1 BRIDGE(S), ON 5.620 KM OF FM 409 (FOREST HIGHWAY 15) FR EAST END OF BOIS D'ARC SPRING BRIDGE TO FM 100, CADDO NATIONAL GRASSLANDS, FANNIN COUNTY, TEXAS	BRIDGE REPLACEMENT	\$0.00	\$0.00
	PUBLIC LANDS DISC.	\$0.00	\$0.00
	OTHER TITLE 23 PROG	\$0.00	\$0.00
	PROGRAM:		
	OTHER STATE FUNDS	\$0.00	\$0.00
	OTHER LOCAL FUNDS	\$0.00	\$0.00
	NON-TITLE 23 FEDERAL	\$0.00	\$0.00
	TOTALS	\$1,105,088.60	\$1,105,090.00
FOREST HIGHWAY 16			

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FOREST HIGHWAY 16			
PROJECT NO. TX FH 92(3)	PROJECT FUNDING	FEDERAL FUNDS	TOTAL FUNDS
ADMIN BY: STATE; STATE PROJ NO: 0911-40-008	FOREST HIGHWAY	\$155,156.33	\$155,156.33
PROJECT STATUS CLOSED / 100 PERCENT COMPLETE 09/25/1997 PER DAFIS REPORT DTD 09/25/1997	SURFACE TRANSP.	\$0.00	\$0.00
	BRIDGE REPLACEMENT	\$0.00	\$0.00
	PUBLIC LANDS DISC.	\$0.00	\$0.00
	OTHER TITLE 23 PROG	\$0.00	\$0.00
	PROGRAM:		
PROJECT SCOPE REPL 2 BRIDGES W/PIPE CULVERTS; REPLACE 1 CULVERT, INCLUDING 0 BRIDGE(S), ON 0.000 KM OF COUNTY ROAD 145 (FOREST HIGHWAY 16) THREE LOCATIONS BTWN FM 358 TO HOUSTON COUNTY LINE, DAVY CROCKETT NATIONAL FOREST, TRINITY COUNTY, TEXAS	OTHER STATE FUNDS	\$0.00	\$0.00
	OTHER LOCAL FUNDS	\$0.00	\$0.00
	NON-TITLE 23 FEDERAL	\$0.00	\$0.00
	TOTALS	\$155,156.33	\$155,156.33
FOREST HIGHWAY 17			
PROJECT NO. TX FH 92(1)	PROJECT FUNDING	FEDERAL FUNDS	TOTAL FUNDS
ADMIN BY: STATE; STATE PROJ NO: 0911-29-004	FOREST HIGHWAY	\$228,994.71	\$228,994.71
PROJECT STATUS CLOSED / 100 PERCENT COMPLETE 09/25/1997 PER DAFIS REPORT DTD 09/25/1997	SURFACE TRANSP.	\$0.00	\$0.00
	BRIDGE REPLACEMENT	\$0.00	\$0.00
	PUBLIC LANDS DISC.	\$0.00	\$0.00
	OTHER TITLE 23 PROG	\$0.00	\$0.00
	PROGRAM:		
PROJECT SCOPE ROAD WORK AND DRAINAGE IMPROVEMENTS AT BRIDGE, INCLUDING 1 BRIDGE(S), ON 0.603 KM OF COUNTY ROAD 369 (FOREST HIGHWAY 17) FH 17 OVER BRUSHY CREEK, SABINE NATIONAL FOREST, SABINE COUNTY, TEXAS	OTHER STATE FUNDS	\$0.00	\$0.00
	OTHER LOCAL FUNDS	\$0.00	\$0.00
	NON-TITLE 23 FEDERAL	\$0.00	\$0.00
	TOTALS	\$228,994.71	\$228,994.71
FOREST HIGHWAY 87			
PROJECT NO. TX FH 92(4)	PROJECT FUNDING	FEDERAL FUNDS	TOTAL FUNDS
ADMIN BY: STATE; STATE PROJ NO: 0911-29-006	FOREST HIGHWAY	\$1,309,479.46	\$1,732,901.46
PROJECT STATUS FINAL VOUCHER PAID / 100 PERCENT COMPLETE 01/04/1998 PER FINAL VOUCHER DTD 01/04/1998	SURFACE TRANSP.	\$0.00	\$0.00
	BRIDGE REPLACEMENT	\$0.00	\$0.00
	PUBLIC LANDS DISC.	\$0.00	\$0.00
	OTHER TITLE 23 PROG	\$0.00	\$0.00
	PROGRAM:		
PROJECT SCOPE RECON GRAVEL ROAD, INCLUDING 0 BRIDGE(S), ON 5.890 KM OF COUNTY ROAD 2343 (FOREST HIGHWAY 17) FROM END OF FM 2343, SOUTH TO FH 87, SABINE NATIONAL FOREST, SABINE COUNTY, TEXAS	OTHER STATE FUNDS	\$0.00	\$0.00
	OTHER LOCAL FUNDS	\$0.00	\$0.00
	NON-TITLE 23 FEDERAL	\$0.00	\$0.00
	TOTALS	\$1,309,479.46	\$1,732,901.46
FOREST HIGHWAY 87			
PROJECT NO. TX FH 92(2)	PROJECT FUNDING	FEDERAL FUNDS	TOTAL FUNDS
ADMIN BY: STATE; STATE PROJ NO: 0911-29-005	FOREST HIGHWAY	\$1,809,497.60	\$1,809,497.60
PROJECT STATUS CLOSED / 100 PERCENT COMPLETE 01/02/1998 PER DAFIS REPORT DTD 01/20/1998	SURFACE TRANSP.	\$0.00	\$0.00
	BRIDGE REPLACEMENT	\$0.00	\$0.00
	PUBLIC LANDS DISC.	\$0.00	\$0.00
	OTHER TITLE 23 PROG	\$0.00	\$0.00
	PROGRAM:		
PROJECT SCOPE ROAD RECON INCL GRADE, DRAIN, BASE, SURF, RR XING, INCLUDING 0 BRIDGE(S), ON 5.538 KM OF FORMER FDR 117 (FOREST HIGHWAY 87) FH 87 FROM US RTE 96 EASTWARD, SABINE NATIONAL FOREST, SHELBY COUNTY, TEXAS	OTHER STATE FUNDS	\$0.00	\$0.00
	OTHER LOCAL FUNDS	\$0.00	\$0.00
	NON-TITLE 23 FEDERAL	\$0.00	\$0.00
	TOTALS	\$1,809,497.60	\$1,809,497.60

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FOREST HIGHWAY 87			
PROJECT NO. TX PFH 87(3)	PROJECT FUNDING	FEDERAL FUNDS	TOTAL FUNDS
ADMIN BY: STATE; STATE PROJ NO: 0911-29-007	FOREST HIGHWAY	\$896,559.71	\$896,559.71
PROJECT STATUS	SURFACE TRANSP.	\$0.00	\$0.00
UNDER DESIGN / 0 PERCENT COMPLETE	BRIDGE REPLACEMENT	\$0.00	\$0.00
04/23/1901 PER PR-2A DTD 04/09/1901 MODIFIED TO AUTHORIZE R/W	PUBLIC LANDS DISC.	\$0.00	\$0.00
PURCHASES	OTHER TITLE 23 PROG	\$0.00	\$0.00
PROJECT SCOPE	PROGRAM:		
ROAD RECON INCL GRADE, DRAIN, BASE, SURF, RR XING, INCLUDING 0	OTHER STATE FUNDS		\$0.00
BRIDGE(S), ON 6.115 KM OF FORMER FDR 117 (FOREST HIGHWAY 87)	OTHER LOCAL FUNDS		\$0.00
FH 87 FROM 3.44 MI E US 96 TO SH 87, SABINE NATIONAL FOREST, SABINE	NON-TITLE 23 FEDERAL		\$0.00
COUNTY, TEXAS	TOTALS	\$896,559.71	\$896,559.71

	FEDERAL FUNDS	TOTAL FUNDS
TOTALS FOR THE STATE OF TEXAS	FOREST HIGHWAY \$10,332,486.00	\$10,755,909.40
	SURFACE TRANSP. \$0.00	\$0.00
NUMBER OF MILES 23.33	BRIDGE REPLACEMENT \$0.00	\$0.00
NUMBER OF KILOMETERS 37.56	PUBLIC LANDS DISC. \$0.00	\$0.00
NUMBER OF BRIDGES 3	OTHER TITLE 23 PROG \$0.00	\$0.00
	OTHER STATE FUNDS	\$0.00
	OTHER LOCAL FUNDS	\$0.00
	NON-TITLE 23 FEDERAL	\$0.00
	TOTALS	\$10,332,486.00 \$10,755,909.40

Appendix L. Glossary

Arterial Road: Primary travel route that provide service to a large land area, usually connecting with public highways or other Forest Service arterial roads.

Collector Road: Road that serves small land areas and usually connects with Forest Service arterials or public highways. They collect traffic from local roads and terminal facilities.

Deferred Maintenance: Work that can be deferred without loss of road serviceability until such time as the work can be economically or efficiently performed.

Forest Roads*: As defined in Title 23, Section 101 of the United States Code (23 U.S.C. 101), any road wholly or partially within, or adjacent to, and serving National Forest System lands and which is necessary for the protection, administration, and utilization of National Forest System lands and the use and development of its resources.

Forest Service Road: A classified forest road under the jurisdiction of the Forest Service. The term "Forest Service Road" is synonymous with the term "National Forest System Road".

Forest Transportation Facility*: A classified road, designated trail, designated airfield, including bridges, culverts, parking lots, log transfer facilities, safety devices, and other transportation network appurtenances, under Forest Service jurisdiction that is wholly or partially within or adjacent to National Forest System lands.

Local Road: Single purpose road, connecting terminal facilities to collectors or arterials.

Maintenance Levels: The level of service provided by a specific road and the maintenance required for that road, consistent with road management objectives and maintenance criteria.

- a) **Maintenance Level 5:** Roads that provide a high degree of user comfort and convenience. Normally are double lane, paved facilities, or aggregate surface with dust abatement. This is the highest standard of maintenance.
- b) **Maintenance Level 4:** Roads that provide a moderate degree of user comfort and convenience at moderate speeds. Most are double lane, and aggregate surfaced. Some may be single lane. Some may be dust abated.
- c) **Maintenance Level 3:** Roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities. Typically low speed, single lane with turnouts and native or aggregate surfacing.
- d) **Maintenance Level 2:** Roads open for use by high-clearance vehicles. Passenger car traffic is discouraged. Traffic is minor administrative, permitted, or dispersed recreation. Non-traffic generated maintenance is minimal.
- e) **Maintenance Level 1:** These roads are closed. Some intermittent use may be authorized. When closed, they must be physically closed with barricades, berms, gates, or other closure devices. Closures must exceed one year. When open, it may be maintained at any other level. When closed to vehicular traffic, they may be suitable and used for nonmotorized uses, with custodial maintenance.

Minimum Forest Road System: The existing State, County, and ML-1, 2, 3, 4, and 5 Forest Service roads which serve National Forest lands and are necessary for the protection, administration, and utilization of National Forest lands and resources.

NFGT: National Forests and Grasslands in Texas.

NFSR: National Forest System Road.

National Forest System Road*: A classified forest road under the jurisdiction of the Forest Service. The term “National Forest System Roads” is synonymous with the term “forest development roads” as used in 23 U.S.C. 205.

New Road Construction*: Activity that results in the addition of forest classified or temporary road miles (36 CFR 212.1).

Objective Maintenance Level: The maintenance level to be assigned at a future date considering future road management objectives, traffic needs, budget constraints, and environmental concerns. The objective maintenance level may be the same as, or higher or lower than, the operational maintenance level.

Operational Maintenance Level: The maintenance level currently assigned to a road considering today’s needs, road condition, budget constraints, and environmental concerns. It defines the level to which the road is currently being maintained.

Passive Use Value: This term includes the following two categories:

- **Existence Values:** Things people appreciate without actually using them or even intending to use them.
- **Bequest Values:** Things people want to remain available for others, such as their descendents, to use and appreciate.

Primary Forest Road System: The existing State, County, and ML-3, 4, and 5 Forest Service roads open to public use which serve National Forest lands and are necessary for the protection, administration, and utilization of National Forest lands and resources.

Public Roads*: Any road or street open to public travel under the jurisdiction of and maintained by a public authority such as states, counties, and local communities (23 USC 101(a)).

Private Road: A road under private ownership authorized by an easement to a private party, or a road that provides access pursuant to a reserved or private right

Public Lands Highways, Forest Highways A coordinated Federal Lands Highway Program includes Forest Highways, Public Lands Highways, Park Roads, Parkways, and Indian Reservation Roads. These are roads under the jurisdiction of and maintained by a public road authority or the Forest Service and open to public travel (23 USC 101).

Road*: A motor vehicle travelway over 50 inches wide, unless classified and managed as a trail. A road may be classified, unclassified, or temporary (36 CFR 212.1).

- a) **Classified Roads*:** Roads wholly or partially within, or adjacent to, National Forest System lands that are determined to be needed for long-term motor vehicle access, including State roads, county roads, privately owned roads, National Forest System roads, and other roads authorized by the Forest Service (36 CFR 212.1).
- b) **Temporary Roads*:** Roads authorized by contract, permit, lease, other written authorization, or emergency operation, not intended to be a part of the forest transportation system and not necessary for long-term resource management (36 CFR 212.1).

- c) **Unclassified Roads***: Roads on National Forest System lands that are not managed as part of the forest transportation system, such as unplanned roads, abandoned travelways, and off-road vehicle tracks that have not been designated and managed as a trail; and those roads that were once under permit or other authorization and were not decommissioned upon the termination of the authorization (36 CFR 212.1). The regulations at 36 CFR 223.37 require revegetation within 10 years.

Road Decommissioning*: Activities that result in the stabilization and restoration of unneeded roads to a more natural state (35 CFR212.1)(FSM 7703).

Road Maintenance*: The ongoing upkeep of a road necessary to retain or restore the road to the approved road management objective.

Road Management Objective (RMO): Describes the purpose of a road, provides design criteria, and establishes operation and maintenance standards based on resource management direction and access and travel management objectives.

Road Reconstruction*: Activity that results in improvement or realignment of an existing classified road as defined below:

- a) **Road Improvement***: Activity that results in an increase of an existing road's traffic service level, expansion of capacity, or a change in its original design function.
- b) **Road Realignment***: Activity that results in a new location of an existing road or portions of an existing road and treatment of the old roadway (36 CFR 212.1).

Roads Subject to the Highway Safety Act*: National Forest System roads that are open to use by the public for standard passenger cars. This includes roads with access restricted on a seasonal basis and roads closed during extreme weather conditions or for emergencies, but which are otherwise open for general public use.

Scale: The level at which an analysis is to be conducted. Analysis scales for roads analyses are generally forest (National Forest), and project.

Traffic service level: Describes the significant characteristics and operating conditions of a road (FSH 7709.56, ch.4).

Unroaded Areas: Areas that do not contain classified roads.

* Indicates definition is from FSM 7705 (1/12/01).



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