SPECIES LIST

A current species list of proposed, threatened and endangered species known or suspected to occur in the project area was requested (3-30-98) and received (4-15-98) from the U.S. Fish and Wildlife Service (FWS). Table 2 lists the threatened, endangered, and proposed species which may be within the influence area of this proposed project.

TABLE 2: Threatened, endangered, and proposed species known or suspected to occur within the influence area of the proposed action

Status	Name	Occurrence
Threatened:	Grizzly bear (*Ursus arctos horribilis)*	Resident
	Bald Eagle (*Haliaetus leucocephalus)*	Resident
	Water howellia *(Howellia aquatilis)*	Potential Resident
	Bull trout (*Salvelinus confluentus*)	Resident/Migrant
Endangered:	Peregrine falcon (*Falco peregrinus)*	Transient
	Gray wolf (*Canis lupus)*	Transient
Proposed	Lynx *(Lynx canadensis)*	Resident

An analysis of bull trout is provided in a separate biological assessment (attached).

THREATENED and ENDANGERED SPECIES ASSESSMENT

BALD EAGLE (*Haliaeetus leucocephalus)*

Description of Population and Habitat Status

The Bald eagle population in the Clark Fork River valley is covered under the Pacific Bald Eagle Recovery Plan (USFWS 1986). The population recovery goals for the entire Pacific Bald Eagle population are: 1) 800 nesting pair; 2) 80% of recovery management zones meet zone breeding population recovery goals; 3) average reproductive rate of 1.0 fledged young per pair, with an average success rate per occupied site of not less than 65%; and 4) stable or increasing wintering populations (USFWS 1986: exec. summary). Currently (1997 data) there are 1,379 nesting pair in the population (Karen Steenhoff - Pacific Bald Eagle Recovery Coordinator - personal communication 6-24-98). Breeding population recovery goals are currently met in 70% of the management zones (ibid). Karen also stated that the reproductive rate is being achieved as is the stable or increasing wintering population numbers.

The project planning area lies in the Upper Columbia Basin Bald Eagle Recovery Zone (Zone 7 - NW Montana and the Idaho Panhandle) (USFWS 1986: pg 7 & 29 and MBEWG 1994: pgs 9-10). The recovery goals (USFWS 1986; pg 27-30) for this portion of the Pacific population are: 1) Habitat Management Goal of a minimum of 98 territories with secure habitat; 2) Population recovery goal of a minimum of 69 breeding pair; 3) Annual production of at least 1.0 fledged young per pair, with an average success rate of occupied sites not less than 65 percent on a 5 year average; and 4) stable or increasing wintering populations. Currently Zone 7 has 127 territories with 108 breeding pairs. The 1996 production averaged 1.2 fledged young per pair, with 74% of the occupied territories being successful (Rob Hazelwood, USFWS personal communication 6-9-98). The 5 year averages are 1.75 fledged young and 75% success rate (Dennis Flath - MFWP personal communication 6-15-98). Wintering populations have been increasing or are stable.

Bald eagles use the Clark Fork River corridor year long. Harms (1992) provided concurrence with a description and maps of the areas on the Kootenai National Forest that needed to be considered as potentially suitable bald eagle habitat in conducting consultations with the USFWS. Basically the area includes all lands within one mile of the major rivers and reservoirs. Over the past 10 years sightings within this zone along the Lower Clark Fork and the Bull rivers have varied from 6 to 38 eagles during a yearly one day January eagle count. The trend has been slightly increasing. The count is done from vehicles along the lower Clark Fork River from Thompson Falls to the Idaho state line and following the Bull river north to the Sanders/Lincoln county line. Farmer and Heath (1987: p. 117) reported a total of 16 sightings in their study area, with five birds the most seen in a single day. Figure BA-3 shows the historic bald eagle sighting areas (not individual sightings as there are multiple year sightings at various locations), based on Farmer and Cabinet District records. Winter use level depends on ice conditions on the Noxon and Cabinet Gorge reservoirs. When the reservoirs freeze, the eagles move to areas with open water (i.e. Lake Pend Oreille in Idaho).

A total of 6 occupied nesting territories (one new site found in 1998) exist along the lower Clark Fork river (all or partially within the Cabinet Ranger District boundary). The 6 occupied nests represent a 60% occupancy of the 10 potential breeding areas on the lower Clark Fork. This is below the desired state-wide management objective of 68%, prescribed in the Montana Bald Eagle Management Plan (1994 pg. 14-15). Two of the breeding areas in the general vicinity of the proposed project contain active breeding pairs. One is about 3 air miles south of the proposed Rock creek tailings impoundment. This nest has been active since 1990 and has fledged young each year through 1997. The second nest was discovered in March of 1994. It is about **4** air miles west of the project area. The nest was occupied by a pair in 1994 and 1995, but failed to produce any young. It was not occupied in 1996, 1997, or 1998 and is thought to be abandoned due to damage to the nest tree. The pair has been seen in the area, but a new nest tree has not been found. The 5 sites have produced an average of 1.0 fledgling per site (5 year average for 1992-1996), with the success rate of occupied sites being 68.4% for the same 5 year period. These rates comply with the reproduction recovery goals for the Upper Columbia Basin Zone.

Nesting habitat is described as the largest living trees, in a multi-storied stand, that is near a body of water that supports an adequate food base (USFWS 1986: pg 13). The nest trees provide an unobstructed view of the foraging site(s). They have open crowns and sturdy limbs to support the massive eagle nests. There are no suitable nest trees (sites) in the ASARCO Rock creek mine project area.

Foraging for fish and waterfowl is done in the two reservoirs (Noxon and Cabinet Gorge) and the major tributary streams (Vermilion and Bull Rivers primarily). Scavenging is done along the railroad tracks and state highways 200 and 56, and along the first mile of Forest Development Road (FDR) 150.

Trees suitable as hunting perches generally have an unobstructed view of the hunting area, and are relatively close to the site. With the primary foraging area being the reservoirs, and most of the project area greater than one mile from the reservoir, the only area that hunting perch sites might occur is within a portion of the proposed tailings impoundment, immediately adjacent to FDR 150. Baseline surveys and district monitoring found no hunting perches in this area. **A** known hunting perch does exist within 1/2 mile of the proposed Rock creek tailings impoundment. It lies between Highway 200 and the Clark Fork river. Roosting sites (areas where eagles spend the night) were not found during baseline studies. District monitoring efforts have found no roost sites in the project area.

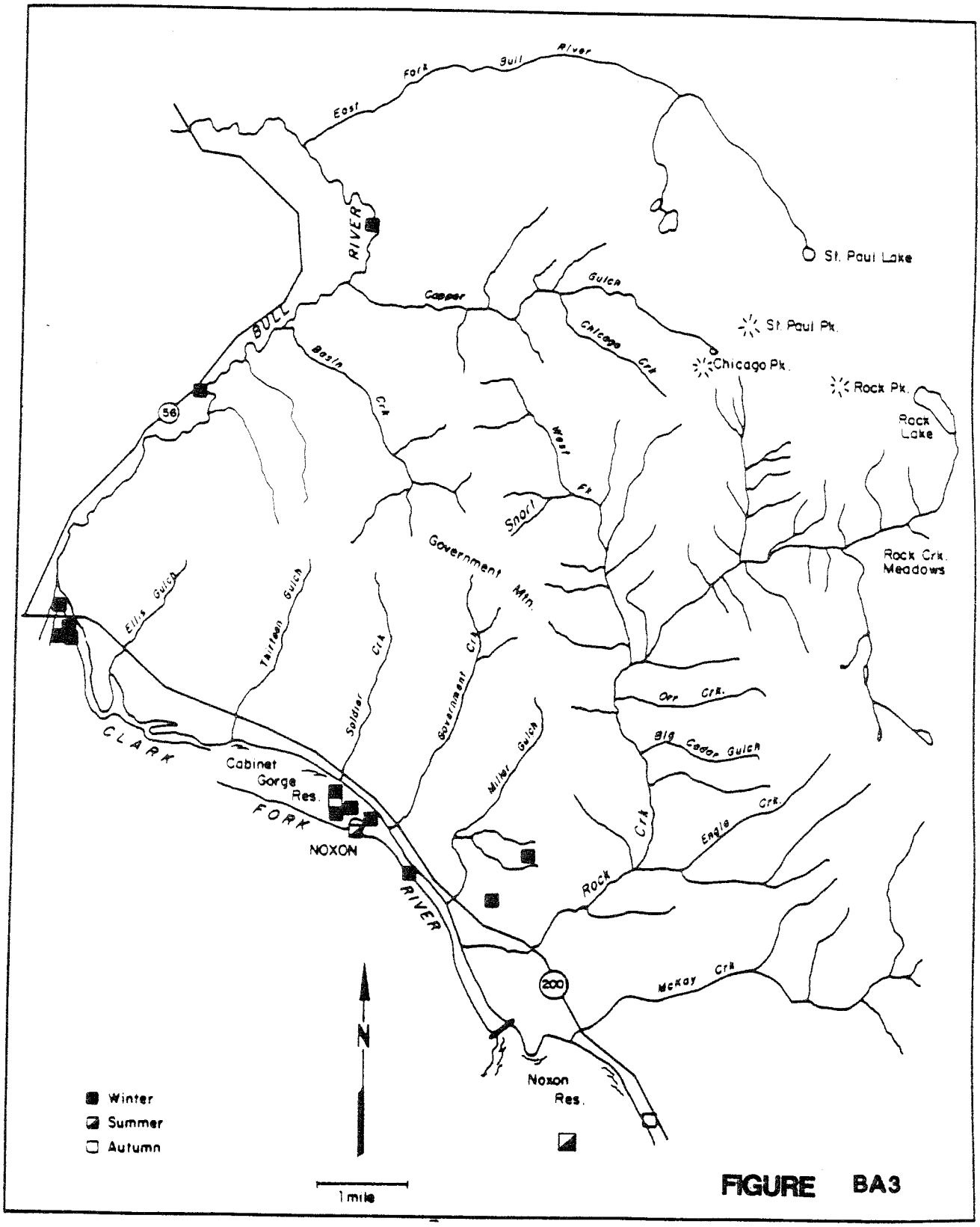


FIGURE BA3

HISTORIC BALD EAGLE SIGHTINGS

Analysis of Direct, Indirect, and Cumulative Effects

No activity is planned within 3.0 air miles of known bald eagle nest sites. Potential perching habitat (larger standing trees or snags) would be removed at the tailings impoundment site. Only a portion of this area is in the USFWS defined (Harms 1992) suitable bald eagle habitat area. Since the tailings impoundment perching habitat is outside the nearest known pair territory, and there is no evidence of eagle use in the proposed impoundment area, and there are many acres of this habitat component available in the area; the loss ofperching habitat is not significant. The known hunting perch site is within the tailings impoundment disturbance influence zone (1/2 mile), The increased noise level may cause the eagles to abandon this hunting perch. The likelihood of this happening is low, as evidenced by the use of this site which is adjacent to Highway 200. Many other potential perch trees exist along the river.

Bald eagle foraging is done primarily in the Clark Fork river and associated reservoirs. The degree *to* which the project could affect the eagle is related to the predicted downstream effects on fish, the primary prey species, Eagles, as the top of the food chain, would be susceptible to accumulation *of* heavy metals (primarily arsenic and mercury). Based in part on data from the Troy mine, a minor increase in some toxic metals could occur, which can increase stress to aquatic life. The likelihood of this happening is low due to negligible potential to form acid (near neutral pH *of* adit water) and the low levels of dissolved metals. This suggests that metal mobility is not a concern (Schafer & Associates 1997). Water treatment is required that removes suspended solids, metals and nitrogen prior to discharge to the Clark Fork River. The resultant metal levels would remain below Montana cold-water aquatic life standards.

The main source of heavy metals would come from a tailings impoundment failure, but the likelihood of failure is very low (less than 1 in 1,000,000: Klohn-Crippen 1997). Based on the Troy mine toxicity data, it is likely that the Rock Creek impoundment tailings water would be toxic to aquatic life in the event of an impoundment failure, especially if the failure occurred a few years after the operation began. In the event of a failure, the lower one mile of Rock Creek would be impacted the most, due to low flows. The Clark Fork river contains harder water which is less sensitive to metals pollution. In addition the substantially larger flow of the Clark Fork River provides significant potential for dilution of metals. The downstream impacts to aquatic life, from metals loading into the Clark Fork river and lake Pend Oreille, would be negligible. Therefore, impacts (due to heavy metals) to the bald eagle would be negligible in both the short and long term.

Sediment and nitrogen loads would temporarily increase and this would impact aquatic invertebrates which could impact fish. Mitigation is planned to reduce sediment from existing sources so that the net result becomes a reduction in sediment (see Bull Trout BA). The down stream impact is negligible. While nitrogen loads will increase (actual level too small to measure), the state has established maximum discharge levels which will be met, with the result that nitrogen levels would remain below Montana cold-water aquatic life standards. The resultant indirect effect to bald eagies would also be negligible. The water resources and aquaticsifisheries monitoring plans are an integral part of the proposed action, and would be used to detect any adverse changes in the food chain used by bald eagles.

Since there is no suitable nesting or winter roost habitat in the project area: there would be no change in these habitat components. Foraging habitat along Highway 200, FDR 150, and the train tracks would potentially increase due to an expected increase in deer mortality (potential 86% increase) from vehicle (minimum 30% increase on Highway 200) and train traffic needed for the proposed project. The

increased food source could result in an increase in mortality risk to bald eagles scavenging on road kill. Alternative V already has a reduced traffic level due to piping the ore slurry rather than hauling it down the 150 road. Mitigation is planned that would remove dead animals from the right-of-way clearings of Forest Road 150 (between Highway 200 junction and the mill site) on a daily basis. In addition, ASARCO would implement an Agency approved traffic management plan (including bussing employees between water treatment and mill sites) to reduce traffic levels on FDR 150. Mitigation should reduce the increased mortality risk, but it will still be greater than the present level due to the 300% increase in ADT (operation phase) on road 150.

Mortality risk from potential electrocution would be mitigated by the requirement to construct power lines using the standards in Olendorff et.al. (1981: pgs 19-43).

The increase in human population due to mine related jobs would require additional housing, which is likely to be along the Clark Fork and Bull rivers. An estimated 150 acres (EIS Ch. 4: Socioeconomics) could be developed, thus reducing bald eagle habitat on a portion of these acres. Because the actual level of hiring residents verses nonresidents in unknown and the site specific locations of construction activities are also unknown, the actual impacts from housing construction on bald eagle habitat are unquantified. No mitigation is planned for this indirect effect. This is because the recovery goals for Zone 7 are being met, and even exceeded by the present zone eagle population. Therefor, this potential minor habitat loss will not adversely effect the population.

Based on the low likelihood of adverse impacts and implementation of proposed mitigation to reduce mortality risk from the proposed project, bald eagle use along the Clark Fork river is expected to continue increasing, as evidenced by the increase in nesting pairs over the past 8 years (from none to 6), until all 10 of the potential breeding areas are occupied.

Statement of Findings

The proposed federal action is **not likely to adversely affect** the bald eagle or its habitat based on: 1) distance to nearest nest site is greater than 2.5 miles (nesting territory radius); 2) no winter roost or nesting habitat impacted by the project; and 3) implementation of effective mitigation and project designs to reduce increased mortality risk; 4) low risk of long term effects from heavy metals; 5) very low risk of catastrophic collapse of tailing impoundment; and 6) existing population is meeting recovery goals and is expected to show a continuing upward trend.

Potential Measures for Removing. Avoiding, or Compensating for Adverse Effects

The analysis performed in conjunction with this Biological Assessment determined that the proposed action is not like to adversely affect the bald eagle. No additional mitigation required than those already identified as part of project design.

PEREGRINE FALCON (*Falco pevegrinus)*

Description of Population and Habitat Status

The proposed project area is part of the Rocky Mountain/Southwest population recovery zone (USFWS, 1984: pg. vi). The recovery goals for this population are: 1) a minimum of 183 breeding pairs and 2)

sustaining a long term average production of 1.25 young per year (ibid pg 20). Presently there are 529 pair in the recovery zone (Rob Hazelwood, USFWS - personal communication 6-29-98) (24 of them in Montana - Dennis Flath: MFWP, personal communication 6-16-98), with an average production of 1.4 young per pair (Rob Hazelwood, USFWS - personal communication 6-29-98).

The peregrine falcon is considered a migrant and potential resident in the lower Clark Fork valley. There is one confirmed sighting (1993) approximately 4 air miles south of the proposed Rock Creek tailings impoundment. A second sighting was reported in May, 1994 by the Peregrine Fund. This sighting was a male (tagged and released from a Peregrine fund hack site in Idaho) in the same area as the 1993 report. Surveys to determine nesting status were conducted over a 5 day period, without confirmation.

An important habitat component for peregrine falcon habitat is the availability of suitable cliffs for nesting (generally greater than 200 feet tall : USFWS, 1984 pg 7). The Peregrine Fund inventoried the Clark Fork drainage (including the Bull river) for such sites in 1989. They identified the cliffs west of Bull Lake and south of Noxon Reservoir (near Tuscor Hill) as potential nesting habitat (Bob Summerfield, KNF Wildlife Biologist, personal communication 10-12-93). The Bull lake cliffs are over 10 air miles northwest of the proposed project. The Tuscor Hill cliffs are 4 air miles south. Hamer (1976: pgs. 3-4) identified the cliffs on Ibex and Scotty peaks as possible nesting habitat. These sites are approximately 12 air miles north of the planning area boundary. Marginal cliffs (less than 200 feet tall) are on the south side of Government Mountain (1 mile west or north). There is no suitable nesting habitat in the ASARCO Rock creek mine project area.

A historic aerie is located just across the state line in Idaho. Attempts were being made to reintroduce peregrines at that site (Bob Summerfield, KNF wildlife biologist, personal communication 10-12-93) through a 'hacking' project. A pair nested and produced young at this site in 1997.

A peregrine prey base (waterfowl and small birds) exists on the Cabinet Gorge and Noxon reservoirs and the surrounding sloughs and wetlands.

Analysis of Direct, Indirect, and Cumulative Effects

Suitable nesting habitat will not be impacted. Peregrine falcon use along the Clark Fork river would remain a possibility. The suitable and marginal nesting habitat would still be available. Since bald eagles and peregrine falcons generally do not co-habit the same nesting territory, and since there is an existing bald eagle nest site within 1/3 mile of the suitable peregrine falcon nesting habitat, the likelihood of a nesting pair moving into the area is only fair. Bald eagles defend their nest territories against other raptors, which tends to discourage other raptor species from nesting in the vicinity of bald eagle nests. The use of the area by migrating peregrines could still occur.

Indirect impacts to the peregrine from heavy metals found in prey (fish-eating waterfowl) would be a low risk (see effects analysis section for bald eagle).

Since the planning area contains no suitable nesting habitat and activity is at least 3 miles from potential high quality nesting habitat, the proposed project would have no direct, indirect or cumulative impacts on peregrine falcon reproduction. Peregrines migrating in the fall could be displaced from any migration route that passes through the lower slopes of Rock Creek (an unknown situation).

Peregrine falcons have been known to collide with powerlines, resulting in death. The construction of new power lines for the project would slightly increase the mortality risk to any peregrine falcons moving through the area. The likelihood of this happening is extremely low, due to limited presence of peregrines and the location of the proposed power line (away from primary hunting area - along the reservoirs).

Statement of Findings

The proposed federal action is **not likely to adversely affect** the peregrine falcon or its habitat based on: 1) Absence of occupied nest sites; 2) No documented sightings in the project area; 3) No loss of suitable nesting habitat; and 4) extremely low mortality risks.

Potential Measures for Removing;, Avoiding, or Compensating for Adverse Effects
IF a peregrine falcon nest site is found within 1 mile of proposed activities, restrict activities (in excess of those which have historically occurred at the site) between February 1 and August 31 (USFWS, 1984).

GRAY WOLF (*Canis lupus*)

Description of Population and Habitat Status

The former range of the Northern Rocky Mountain wolf (also called gray wolf) included the proposed project area (USDI 1987: pg 2). The gray wolf in this area is covered under the Northern Rocky Mountain Wolf Recovery Plan (USFWS 1987). The plan identified 3 recovery zones (USFWS, 1957: figure **2** pg. 23), with a recovery goal of a minimum of 10 breeding pairs for 3 successive years in each zone. Presently (Bangs 1998a & b) each of the three recovery areas have at least 8 breeding pairs.

The project area lies in "management zone III" between the Northwest Montana and Central Idaho recovery areas. Because wolves, themselves, have defined habitat as any lower elevation area that supports white-tailed deer (Bangs 1998a pg. 2) (mostly in management zone III) and because the habitat within the Northwest Montana Recovery area is fully occupied (Bangs 1998a pg. 6), wolf recovery in NW Montana is currently promoted in any area where there are not chronic conflicts with livestock (Bangs 1998a pg. **2).** Currently there are about 75 adult wolves in 7-9 packs and up to 40 pups in NW Montana (Bangs 1998b pg. 1).

The wolf is a known transient and potential resident in the lower Clark Fork valley. There is a 1979 unconfirmed sighting 1 mile easr of the proposed mill site. There are two unconfirmed sightings (1991) one mile west of the proposed ASARCO Rock Creek tailings impoundment and a second unconfirmed report of three wolves in the same area in 1995. There are three unconfirmed 1994 reports of a pack (minimum of 3 animals) using the Pillick Ridge/Blue creek area, which runs 7 to 15 air miles northwest of the project area. Information suggests a high probability of wolves west of the project area. The only confirmed wolf sighting (1996) comes from the Vermilion River which is 14 air miles southeast of the project area. Based on the historical range and the locations of the various sightings, the Rock Creek drainage probably serves as part of a movement area along the Clark Fork River valley between better habitats (i.e. Thompson River drainage to the southeast and Lightning Creek drainage to the northwest, in Idaho).

A prey base of elk and deer exists in the area to contribute to the support of a wolf pack, however the topography in the Rock Creek drainage does not provide easy hunting opportunities due to steep slopes. **A** wolf pack would need a much larger area (and generally an area with gentler slopes) than just the Rock creek drainage to establish a territory (i.e. a drainage the size of the Thompson River). The National Forest portion of the project area downstream from Engle creek is allocated to big game winter range.

The drainage configuration, relatively narrow v-shapped valley, does not provide many suitable denning or rendezvous sites. The presence of existing Forest road 150 (open to vehicle traffic) in the valley bottom, and the associated human activity, further reduces any opportunity for wolves to den or rendezvous in the Rock Creek drainage.

Den sites are generally greater than one mile from open roads or trails and one to two miles from camp sites (USFWS, 1987: p.73). These sites are normally on southerly aspects, on moderate slopes, within 400 yards of surface water, and at an elevation overlooking surrounding low-lying areas. There are no known den sites in the Rock creek drainage.

Rendezvous sites (resting and gathering areas) are usually complexes of meadows and adjacent timber, with surface water nearby (USFWS, 1987: p.73). They tend to be away from human activity and on drier sites that are slightly elevated above riparian areas (ibid). There are no known rendezvous sites in the Rock creek drainage.

A major component of wolf habitat is sufficient space with minimal exposure to humans (USFWS, 1987: p.7). Space is discussed in the section on grizzly bear.

Analysis of Direct, Indirect, and Cumulative Effects

The increase in human activity (operations 7 days a week for up to 30 years) would effectively eliminate the suitability of the stream bottom portion of Rock creek for use by wolves. The increased potential for human/wolf encounters would result in a greater mortality risk for wolves entering the Rock creek drainage. Mortality risk could also be increased due to the potential availability of a greater number of vehicle killed deer or elk (see discussion in Bald Eagle analysis). Mitigation (designed to protect the grizzly, but also benefiting the wolf) like the traffic management plan (includes busing employees from water treatment site to mill site), and not allowing firearms in ASARCO vehicles, should be effective in offsetting the increase in mortality risk. The closure of roads to meet ORD standards for grizzly bear would benefit wolves (see section on grizzly bear).

Prey base habitat and population potential would remain essentially the same. As there are no known den or rendezvous sites in the planning area and the likelihood of a pack establishing a site is low due to the presence of the 150 road, the proposed project would not affect this habitat component. Should wolves attempt to hunt in the area during operations, they would be displaced by mining activities (ie. mill site, hauling, tailings impoundment work). Displacement habitat would be available (see section on grizzly bear). Corridors connecting the project area to displacement habitat would be impacted by the increased traffic levels and perhaps by housing developments (see discussion in Bald Eagle and grizzly bear analyses). The reduced corridor effectiveness would primarily be in the corridor between bear analysis areas 7-6-1,7-5-2 and 7-4-7. Mitigation from the agency approved ASARCO traffic management plan , and the proposed closure of a portion of the 150 road would reduce this effect.

Statement of Findings

The proposed federal action is **not likely to adversely affect** the gray wolf or its habitat based on: 1) Absence of confirmed wolf sightings in the area; 2) No known den or rendezvous sites in the area; 3) The low likelihood of wolves establishing a den or rendezvous site in Rock creek (due to 150 road location); and 4) Implementation of effective mitigation measures (designed for the grizzly , but also benefitting the wolf) as part of the project design (traffic management plan - with bussing, no firearms, road closures).

Potential Measures for Removing;, Avoiding, or Compensating for Adverse Effects
The analysis performed in conjunction with this Biological Assessment determined that the proposed action is not like to adversely affect the gray wolf. No additional mitigation required as measures are part of project design.

GRIZZLY BEAR (*Ursus arctos horribilis)*

Description of Population and Habitat Status
The proposed project lies in the Cabinet/Yaak recovery zone (USFWS, 1993: figure 10 pg. 80). The grizzlies in the CYE are listed as threatened, but the USFWS determined that a reclassification to endangered is warranted but precluded (Fed.Reg. Vol. 58, No. 28, 1993 pgs 8250-8251).

Recovery plan goals for the CYE (USFWS 1993, pg 83) are:

- *Six females with cubs over a running 6 year average.* The 6 year average (1992-97) of females with cubs was 1.5 (Servheen 1998, pg 5).

- *18 of the 22 BMUs (Bear Management Units) to be occupied by females with young from a running 6 year sum.* Twelve of the 22 BMUs had credible sightings of females with young during 1992-1997 (ibid). It should be noted that the same female with young may occur in several BMUs (in the 1991 - 1994 reporting period 3 females occurred in 8 BMUs). During the same period, BMU 5 (1993) and BMU 6 (1993, 1996) were occupied. BMUs 4, 7 and 8 were not confirmed to be occupied by female(s) with young during that time frame.

- *Human caused mortality not to exceed 4% of the population estimate based on the most recent 3 year sum of females with cubs. An interim mortality goal of zero human caused mortalities has been established due to current low numbers.* Human caused mortality level is currently 0.6% (ibid). The human caused female mortality rate has been zero percent for the last three reporting 6 year periods.

- *A calculated minimum population (based on number of females with cubs) of 106 bear.* The calculated minimum population presently is 28 (based on - last 3 years ave. # of females = 5) (ibid).

The present total population estimate for this ecosystem is between 30 to 40 grizzly bears (Wayne Kasworm, et.al. 1997: pg. 6). The population was thought to be old-aged and on the decline (Kasworm and Manley, 1988), so four young female grizzlies were transplanted into the Cabinet Mountains from Canada (1990-1995). One of these transplants has since died from undetermined causes. Kasworms' research now indicates a very slow increase in the population, as the number of known grizzly bears has increased from 10 in 1990 to 16 in 1994. The increase is due to greater search efforts, augmentation, and a portion is due to reproduction (Kasworm has documented reproduction of offspring from offspring in the CYE).

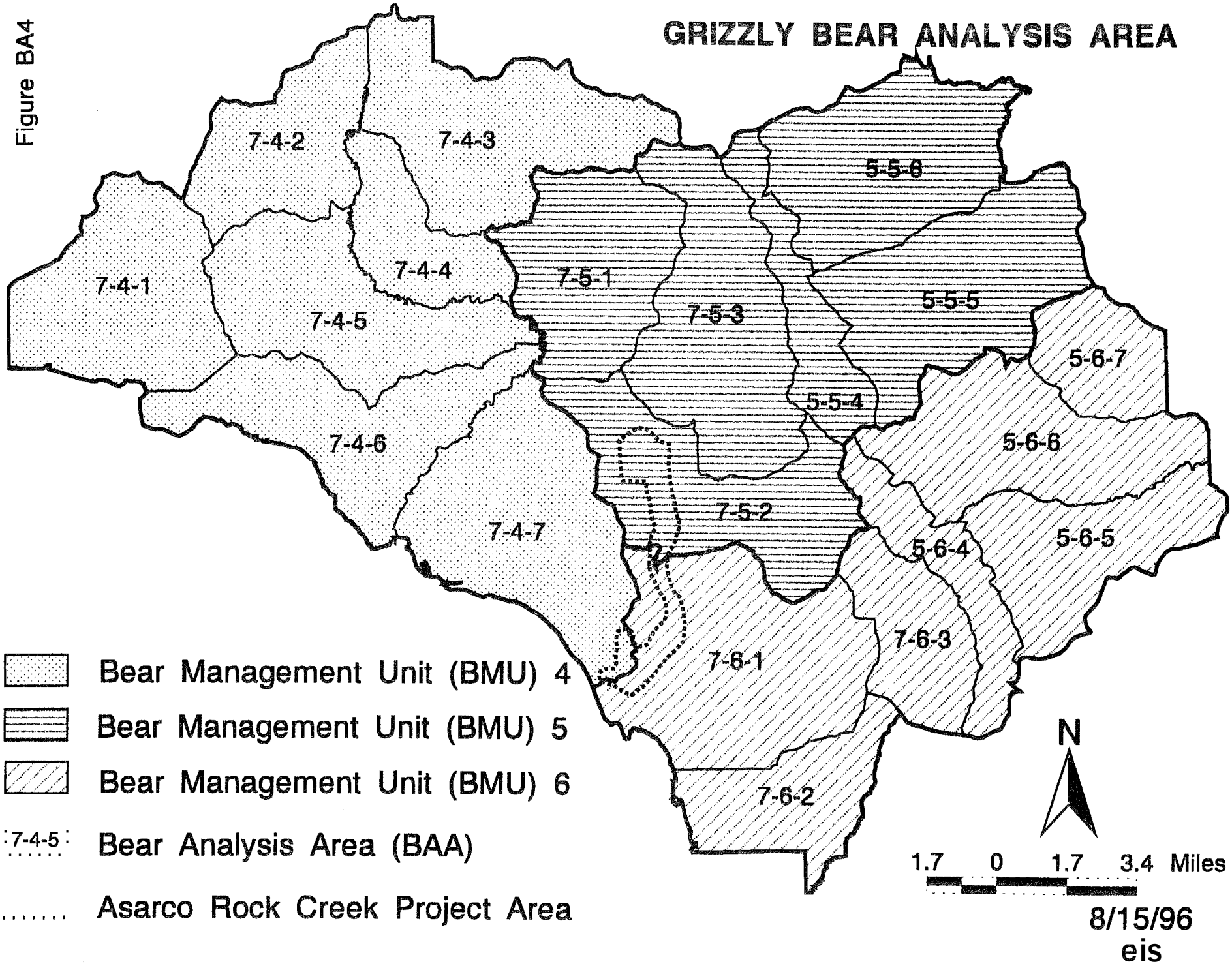
Research (Kasworm et.al. 1988 pgs 39-49; 1995 pgs 26-30) shows that seven bears have home ranges that include the portion of the Cabinet Mountains between Rock creek and Ramsey creek (Montanore project location). Two of these bears are known to have died since documentation of their home ranges. Native bear movements in this area are generally in a north/south pattern (personal communication: Wayne Kasworm, USFWS grizzly bear research biologist, 6-6-96). Southern movement generally takes place on the east side of the Cabinet Mountains and northern movements occur generally on the west side of the Cabinet range (based on movements of the 7 grizzly bear using the southern part of the Cabinet mountains.

Kasworm and Servheen (1995 pg 10) document 629 credible grizzly bear reports for the CYE between 1960 and 1994. Their data reveals two areas in the Cabinets that contain a dense cluster of sightings (Ibid Fig. 2 pg 11). One area is in the southern Cabinets between the Ramsey/Rock creeks and Swamp/Lake creeks area. This area is the primary analysis area for grizzly and covers Bear Management Units (BMUs) 4 (Bull), 5 (St.Paul), and 4 (Wanless) (Figure BA-4). The proposed project lies in Bear Analysis Areas (BAAs) 7-4-7, 7-5-2, 7-5-3 and 7-6-1 (Figure 3-20). Table 3 summarizes reports of grizzlies in these BAAs since 1960.

Table 3: Grizzly Reports Between 1960 and 1997.

BAA	Visual Sightings	Radio Locations	Den Sites	Mortality
	(1960-1997)	(1983-1995)	(1977-97)	(1975-1997)
7-4-7	11	1	0	0
7-5-2	8	6	1	1
7-5-3	8	50	0	1
7-6-1	8	13	0	0

Figure BA4


GRIZZLY BEAR ANALYSIS AREA
7-4-1
7-4-2
7-4-3
7-4-4
7-4-5
7-4-6
7-4-7
7-5-1
7-5-2
7-5-3
7-6-1
7-6-2
7-6-3
5-5-4
5-5-5
5-5-6
5-6-4
5-6-5
5-6-6
5-6-7
Bear Management Unit (BMU) 4
Bear Management Unit (BMU) 5
Bear Management Unit (BMU) 6
7-4-5 Bear Analysis Area (BAA)
Asarco Rock Creek Project Area
N
1.7 0 1.7 3.4 Miles
8/15/96
eis

Habitat components important to grizzly bear have been mapped for the proposed project (Appendix 9). Table 4 summarizes the acres of each component whose polygon was all or partially in the project influence zone (analysis area), the actual influence zone habitat components, and the acres of habitat components physically changed by the project. Grizzlies select habitat types rich in herbaceous foods in spring and early summer. Late summer and fall habitat is dominated by sites with abundant huckleberry fields (Erickson et.al. 1987). There are no large huckleberry fields in the project direct impact area. Huckleberry production in the project area is probably declining due to closing forest canopies. The Rock creek drainage provides about the same proportion of key habitat components as other areas of the Cabinet mountains.

Table 4: Grizzly Bear Habitat Components (Map in Appendix 9)

Habitat Component	Analysis Area Acres *	IZ Impact Acres	Direct Impact Acres
Conifer Forest (seedling/sapling)	589	181	21
Conifer Forest (pole to medium sawtimber)	9254	3866	353
Conifer Forest (large sawtimber: >15" dbh)	5310	2122	88
Conifer Forest/Rock complex	207	76	
Huckleberry shrubfield	490	227	1
Rock	446	204	
Shrubfield	426	158	2
Wet Meadow	14	6	
Beargrass sidehill park	22	22	
Grassy sidehill park	39	25	5
Grassy disturbed area	20	20	1
Riparian stream bottom	66	66	
Forb field	155	12	2
Shrub/forb field	142	38	9
Dry meadow	3	1	
Aquatic	4	4	
Bare ground	17	16	1
TOTAL ANALYSIS AREA	17204	7044	483

* = These acres include area of habitat polygons that extend beyond project influence zone
IZ = Influence zone (1/4 - 1/2 mile or ridge line from project activity) for Alternative 5.
Direct Impact acres = actual physical disturbance (Alt. 5).

Grizzly denning habitat is generally above 5200 feet in elevation and on north and west aspects in the Cabinet mountains (Kasworm and Thier, 1992: 40 and 1993: 44). The Rock creek drainage does contain suitable denning habitat, but none exists in the ASARCO Rock Creek Mine project permit area. There is one known den site in the Rock creek drainage. A transplanted bear denned in Rock Creek the winter prior to its death (cause unknown).

Habitat effectiveness or percent of the area free from human disturbance is one of the elements of bear habitat modeling. The existing habitat effectiveness of each impacted BMU is: BMU 4 - 62.5%, BMU 5 - 74.5%, and BMU 6 - 68.1% (see Appendix 7). BMU 5 meets the desired 70% minimum level of free space, as defined by model developers.

The Kootenai Forest Plan (USDA, 1987) establishes a maximum open road density (ORD) standard on areas managed for grizzly bear of 0.75 miles per square mile. This same objective applies to each BAA. Table 5 displays the existing situation for open road density in each Bear Analysis area where the project would be active, or used for a displacement area.

Table 5: Existing Road Density (Miles per square mile) Summary

ACTIVE BAA		DISPLACEMENT BAA	
BAA	ORD	BAA	ORD
7-4-7	0.62	7-4-5	0.00
		7-4-6	0.00
7-5-2	0.86	7-5-1	0.73
		7-5-3	0.00 1/
7-6-1	0.77	7-6-2	0.00
		7-6-3	0.00

1/ BAA 7-5-3 has minor surface activity during construction of ventilation adit, but then is available for displacement. See Map in Appendix 13

The project area lies in Management Situation 1 (MS1) (necessary for the recovery of the species), and Management Situation 3 (MS3) lands (grizzly use may occur, but such use is not enccuraged - to prevent conflicts with human use or occupancy). Private (non-corporate) land and lands within 1/4 mile of private lands along state highway 200 are in Management Situation 3.

Moving Windows Route Density Analysis and Core Existing Situations

An existing condition moving windows (Table 6) and core analysis (Table 7) was completed to comply with the USFWS incidental take statement (7-27-95) on the Kootenai National Forest Plan. Wakkinen and Kasworm (1997) reported that total route densities exceeding 2 mi/sq.mi. averaged 26 percent of the home range for 6 female grizzly bear in the CYE. The open route density greater than 1 mi./sq.mi. averaged 33 percent of the home range and core areas made up 55 percent of the home range.

Table 6: Existing Moving Windows route densities (% BMU by route density category)

	Open Routes (%)				Total Routes (%) *			
BMU	0 mi.	0-1 mi.	1-2 mi.	> 2 mi.	0 mi.	0-1 mi.	1-2 mi.	> 2 mi.
4 \a	46.9	14.1	15.0	24.0	43.9	13.7	14.3	28.1
5 \b	57.0	13.8	16.5	12.7	42.9	16.5	18.3	22.3
6 \a	51.4	14.3	13.4	20.9	37.0	13.2	15.7	34.1
7 \b	63.4	11.8	10.2	14.6	48.7	15.4	14.2	21.7
8 \c	40.4	17.1	21.8	20.7	36.4	19.5	21.9	22.2
22 \d	45.0	13.0	15.0	27.0	31.0	13.0	14.0	42.0

* does not include bamered roads (per IGBC Grizzly Bear Access Committee notes 2/97) (SEE MAPS - APPENDIX 6)
\a based on 7/98 analysis by Kootenai NF S O
\b based on 6/98 analysis by Kootenai NF S O
\c based on 2/97 analysis by Cabinet Ranger District, KNF
\d based on 5/97 analysis by Plains district (Lolo NF)

Table 7: Existing (8/97) Core habitat analysis summary (% BMU in Core by habitat block size)

BMU	≤ 4sq.mi. *	> 4 sq.mi. *	Total % Core
4 \a	5.1	55.1	60.2
5 \b	4.9	55.8	60.7
6 \c	10.1	41.0	51.1
7 \b	1.1	66.2	67.3
8 \d	3.3	52.7	56.0
22 \e	1.6	46.1	47.7

* core habitat block size (SEE MAPS -APPENDIX 6)
Existing does not include Montanore as planned start year was 1998, and "core" analysis was not available at the time of Montanore analysis
\a based on 8197 analysis by Kootenai NF S O
\b based on 6/98 analysis by Kootenai NF S O
c based on 7/98 analysis by Libby Ranger District, KNF
\d based on 2/97 analysis by Cabinet Ranger District. KNF
\e based on 5/97 analysis by Plains district (Lolo XF)

Summary Analysis of Direct, Indirect. and Cumulative Effects

Construction and operation of the mine, mill and associated activities would have direct, indirect and cumulative effects on the grizzly bear and its habitat. Direct effects are those on-site activities which alter habitat, displace bears from habitat normally used, or affect the productivity, survival or mortality of the grizzly. Indirect effects are those activities that take place off-site (beyond the permit area) and are not directly tied to the operation of the mine. Indirect effects can also affect productivity, survival or mortality of grizzlies. Housing development and recreation activity are examples of indirect effects. Cumulative effects result from the combination of effects from past, present and other foreseeable 'future projects.

A cumulative effects analysis process was developed for the Cabinet/Yaak ecosystem (USDA et.al., 1988). This process is referred to as the Cumulative Effects Model, or CEM for short. This CEM looks at habitat conditions and all human activities that could displace or result in bear mortality. The details of this process are summarized in appendix 4 (habitat impacts) and appendix 11 (mortality risk). The results of the CEM analysis are included in the rest of the effects sections.

Table 8 displays the distribution cf major activities (in the Bull, St. Paul and Wanless bear management units) that were included in the cumulative effects analysis.

The results of project implementation on moving windows route densities and core are displayed in Tables 9 and 10 and on the maps in Appendix 6.

Although the project effects on habitat effectiveness are relatively small (Table 11), the proposed project does not meet Forest direction for cumulative habitat effectiveness (70% in each BMU) in all 3 of the BMUs (Table 12).

Grizzly bear would be displaced from the project area (7044 acre influence zone) during all phases of the proposed project (exploration, construction, and operation). Displacement habitat would be provided in adjacent BAAs (see Table 15 and maps in Appendix 14). The greatest displacement factor would be the perpetual operations (7 days a week, **24** hours a day).

Grizzly habitat would be physically changed on 483 acres by the construction of the mill and water treatment sites, tailings impoundment, utility and road corridors and placement of excavated material at waste and storage sites. In addition, the presence of humans, during construction would influence grizzly use on an additional 6561 acres of habitat within 1/4 to 1/2 mile of physically disturbed sites and human travel routes. During operations the disturbance acres would only be 6420. **A** portion of the area influenced by the proposed project presently experiences some human disturbance. Disturbance would generally be much greater with the proposal because of intensity (7 days a week). Table 12 summarizes the cumulative reduced habitat effectiveness by BMU.

Denning habitat, as described by Kasworm and Thier (1992 pg.40 and 1993 pg.44), would not be directly disturbed by the proposed project. Indirectly, there is a potential to disturb bears in denning habitat from the expected increase in recreational activity (see Appendix 12).

Mitigation is required that would provide replacement habitat (2,350 acres - on or off-site as available) for those acres directly modified or having reduced habitat effectiveness from the direct impacts of the project. In addition, the indirect effects of increased recreation (displacement along a fracture zone) are mitigated by additional replacement habitat (100 acres of on-site mitigation - within north to south movement corridor in Cabinet Mountains).

Table 8. Temporal/spatial distribution of major activities in Bull, St.Paul, and Wanless BMUs. 1/

Bear Analysis Area	Present Activity 1997	Projected Major Activity				
		1998	1999	2000	2001-05	2006-35
7-6-1	AB	AB	A	CX	Y	Z
7-6-2						
7-6-3						
5-6-4						
5-6-5	I	I	IN	IN	IN	?
5-6-6	G	L	L	L	L	?
5-6-7			K			
7-5-1	D E F	E				
7-5-2				X	Y	Z
7-5-3				X	Y	Z
5-5-4						
5-5-5			M	M	M	M
5-5-6			M	M	M	M
7-4-1						
7-4-2						
7-4-3	H	H	H	H		
7-4-4	H	H	H	H		
7-4-5						
7-4-6						
7-4-7	J			X	Y	Z

1/ Each letter represents a separate major activity as shown below. Activities are included in cumulative effects analysis.

A = Cedar Gulch Timber Sale
B = ASARCO logging of private land
C = Cedar Gulch Timber Sale site prep and reforestation
(counted as major activity due to helicopter use)
D = Lost Girl Timber Sale
E = Lost Girl Timber Sale site prep and reforestation
F = North Sorrel Heli Timber Sale
G = Corral Salvage Timber Sale
H = Berray Mountain Timber Sale
I = Skranak Mine
J = MFP Private Logging
K = Noranda Montanore Powerline
L = Harpole Mine
M = Noranda MONTANORE mine project
N = Bear Lakes private property access and activity
X = ASARCO Rock Creek Mine Exploration
Y = ASARCO Rock Creek Mine Construction
Z = ASARCO Rock Creek Mine Operation and Rehabilitation

Moving Windows and Core Analysis

Table 9: Project Moving Windows route densities (% BMU by route density category)

	Open Routes				Total Routes *			
BMU	0 mi.	0-1 mi.	1-2 mi.	> 2 mi.	0 mi.	0-1 mi.	1-2 mi.	> 2 mi.
4	47.9	14.9	15.7	21.5	44.3	14.2	15.8	25.7
5	55.0	14.9	14.1	16.0	43.5	15.8	16.6	24.1
6	49.7	16.6	14.9	18.8	34.4	14.7	16.3	34.6
7	49.2	15.6	14.5	20.8	45.1	21.7	17.2	16.0
8	40.4	17.1	21.8	20.7	36.4	19.5	21.9	22.2
22	45.0	13.0	15.0	27.0	31.0	13.0	14.0	42.0

* does not include barriered roads (per IGBC Grizzly Bear Access Committee notes 2/97) (SEE MAPS - APPENDIX 6)
Changes are cumulative (includes all forseeable future projects).

Table 10: Project Core habitat analysis summary (% BMU in Core by habitat block size)

BMU	≤ 4 sq.mi. *	> 4 sq.mi. *	Total % Core	Core Change due to ASARCO 1999-2000 **	Cumulative Core Change 1998-2000 ***
4 \a	5.3	55.6	60.9	+ 1.2	+ 1.2
5 \b	4.1	56.1	60.2	0.0	- 0.8
6 \f	9.8	40.1	49.9	0.0	- 2.2
7 \c	1.1	64.9	66.0	0.0	- 1.9
8 \d	3.3	52.7	56.0	0.0	0.0
22 \e	1.6	0.0	47.7	0.0	0.0

* core habitat block size (SEE MAPS - APPENDIX 6)
** Change between 1999 (Noranda) and 2000 (due to ASARCO only)
***.Change from existing (1998) and Asarco (2000) due to all activities: (-) changes due to activity on private land.
\a based on 7/98 analysis by Kootenai NF S.O.
\b based on 6/98 analysis by Kootenai NF S.O.
\c based on 8/97 analysis by Kootenai NF S.O.
\d based on 2/97 analysis by Cabinet Ranger District, KNF
\e based on 5/97 analysis by Plains district (Lolo NF)
\f based on 7/98 analysis by Libby Ranger District

Recovery Objectives Analysis

The goal for grizzly bear management on the Kootenai National Forest is to provide sufficient quantity and quality of habitat to facilitate grizzly bear recovery. An integral part of the goal is to implement measures within the authority of the Forest Service to minimize human-caused grizzly bear mortalities.

This goal is accomplished by achieving certain objectives relative to grizzly bear recovery (Harms 1990). A number of measures are used to gauge whether the objectives are being met. These measures include Forest Plan standards and guidelines and other measures developed through consultation with U.S. Fish and Wildlife Service. The following analysis describes the potential effects, including cumulative effects of the proposed action by examining how these measures are implemented and, thus, how the objectives relating to grizzly bear recovery are met.

Objective 1: Provide adequate space to meet the spatial requirements of a recovered grizzly bear population.

Spatial requirements are achieved by implementing three Forest Plan standards. The first standard, application of the cumulative effects analysis process (Chnstensen and Madel 1982), demonstrates that the amount of available bear habitat is below the minimum threshold of 70 percent in two of the three affected Bear Management Units (BMU). This figure is referred to as habitat effectiveness or available space (see Tables 11 and 12).

TABLE 11: Percent change in grizzly bear habitat effectiveness (H.E) in the Bull, St.Paul, and Wanless BMU s due to ASARCO Rock creek mine *

Alt.	BMU 4	BMU 5	BMU 6
5	+1.0	-1.1	-0.3

* figures do *not* translate directly to %shown in table 12 because 12 includes all other projects effects (Cumulative)

TABLE 12: Cumulative Grizzly bear H.E. in the Bull, St.Paul and Wanless BMUs before, during, and after the proposed action

	Existing Situation		During Proposed Action			After Proposed Action
	% H.E.				*Yo* N.E.	*Yo* H.E.
BMU	'98	'99	'00	'01	2002-2034	*2035*
4	62.5	62.5	62.3	62.3	65.4	*65.5*
5	75.4	64.8	64.1	64.1	64.1	64.6
6	68.1	68.0	66.0	66.0	66.0	*68.0*

(See Appendix *7* for projects included in cumulative change to H.E.)

Mitigation is required that will provide habitat enhancements to compensate for the reduction in HE caused by the proposed project (see Appendix 5 - Mitigation Plan item B2).

The second standard sets a maximum open road density of 0.75 linear miles of open road per square mile of habitat within each affected Bear Analysis Area. Table 13 displays QRD by Bear Analysis Area and maps in Appendix 13 show the spatial arrangement of BAAs meeting and not meeting the ORD standard.

Table 13: Open-road density (linear miles road/square mile) for BMUs 4, 5, and 6 by Bear Analysis Area (MS-1 lands only) (see map in Appendix 13)

Bear Analysis Area	Existing Situation	During Proposed Action					After Proposed Action
	1998	1999	2000	2001	2002	2003	2004-34	2035
7-4-1	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
7-4-2	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
7-4-3	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.63
7-4-4 1/	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7-4-5 1/	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7-4-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7-4-7 * 5/	0.62	0.62	0.59	0.59	0.59	0.59	0.59	0.62
7-5-1	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
7-5-2 * 4/	0.86	0.86	0.79	0.79	0.79	0.79	0.79	0.79
7-5-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-5-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-5-5	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17
5-5-6	0.84	0.72	0.72	0.72	0.72	0.72	0.72	0.72
7-6-1 * 3/	0.77	0.77	0.62	0.62	0.42	0.62	0.62	0.62
7-6-2 1/	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7-6-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-6-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-6-5	0.62	0.43	0.51	0.51	0.51	0.51	0.51	0.51
5-6-6 2/	1.51	1.18	1.18	1.18	1.18	1.18	1.18	1.18
5-6-7	0.85	0.85	1.45	1.45	1.45	1.45	1.45	1.45

* BAA where ASARCO Rock Creek Mine active

1/ All road activity in Management Situation 3

2/ ORD reduced to 0.95 with Corral Salvage Timber Sale (- 1996)

3/ ORD reduced to 0.62 with Cedar Gulch TS completion (- 1999) and ASARCO Rock Creek Mine (2000-road 2285)

4/ ORD reduced to 0.79 with ASARCO Rock Creek Mine (roads 2741A - .5 mi, 2741x - .2 mi. and 150 - .9 mi.)

5/ ORD reduced to 0.59 with ASARCO Rock Creek Mine (road 150 - 2 miles)

The road densities displayed in Table 13 do not reflect the impacts of administrative use. The 1993 Grizzly Recovery Plan (pg. 148) recommends that administrative use not exceed 14 days during the time bears are out of the den (about April 1 to November 14). A bear does not differentiate between public or administrative use and may thus avoid administratively used roads. An analysis of open road density was done for the BAAs where ASARCO activities would take place. Data from the 1992, 1993 and 1994 administrative gate permits were analyzed. The results are displayed in Table 14. With administrative use, none of the BAAs meet 0.75 ORD. Consultation on the Skyline Timber Sale resulted in a change in the unit of measure for adminstrative use from "14 days" to "121 round trips". The number of trips have not been monitored prior to this time, therefore no data is available to analyze impacts of administrative use in this area using the round trip measurement.

TABLE 14: Open Road Densities by BAA including Administrative use \1

Bear Analysis Area	Without Admin. Use			With Administrative Use		
	1992	1993	1994	1992	1993	1994
7-4-7	0.89	0.89	0.89	1.07	0.98	0.98
7-5-1	0.52	0.52	0.57	1.05	1.05	1.05
7-5-2	0.78	0.78	0.79	0.78	0.78	0.79
7-6-1	0.76	0.76	0.76	1.03	1.03	1.03

\1 Admin. use counted as open road when days used exceeded 14 per bear year.

The third standard provides that a 5,000 - 15,000 acre displacement area (an area meeting all standards and containing no major activities) be provided adjacent to each Bear Analysis Area containing a major activity. Table 15 shows the displacement schedule and maps in Appendix 14 show spatial arrangement of active, displacement, and inactive BAAs.

The primary purpose of displacement analysis is to look at two broad scale bear habitat components, spring verses fall and denning habitat. While each of these general habitats are comprised of many individual elements (ie. avalanche chutes, huckleberry fields, coniferous forest etc.), the broader scale components have been defined using elevation and aspect (Kasworm's CYE annual grizzly and black bear research reports). Since grizzly bear habitat compontents are generally spread evenly across the ecosystem: as determined by physiographic features (ie. aspect, elevation), the use of these features (as a proxy) to determine acres of available replacement habitat is appropriate.

To assure in-kind habitat in the displacement areas an analysis was conducted on each BAA to determine the available acres by aspect (N,S,E,W) in two elevation zones (above and below 5,000 feet) (Table 16). This analysis method has been determined to be adequate for a displacement analysis (Kevin Shelly, USFWS, personal communication 11-19-93). In addition, the same analysis was done on the core habitat (Table 17).

The displacement analysis shows that it will take more than one BAA to provide displacement habitat for habitat lost due to activities in BAA 7-6-1 and 7-4-7. Two BAAs (7-6-2 and 7-6-3) will be required to provide displacement habitat for 7-6-1. Likewise, 7-4-7 will require *two* displacement areas (7-4-5 and 7-4-6). Displacement for 7-5-2 will be provided in 7-5-3. The displacement areas will not have any major activity in them for the life of ASARCO's Rock Creek Mine (see Tables 15 and 16 and maps in Appendix 14). The end result would be undisturbed displacement areas that provide 177 acres (below 5000 feet) and 7,452 acres (above 5000 feet) more than is available in BAAs where proposed project is planned.

TABLE 15: Displacement area scheduling in BULL, ST.PAUL and WANLESS BMUs

Year	Active BAA	Displacement BAA	Purpose
1997	7-4-3	7-2-3	Berray Mtn. TS
	7-4-4	7-4-2	Berray Mtn. TS
	7-6-1	7-6-2	Cedar Gulch TS
1998-1999	7-4-3	7-2-3	Berray Mtn. TS
	7-4-4	7-4-2	Berray Mtn. TS
	7-6-1	7-6-2	Cedar Gulch TS
	5-5-5	5-5-6 and 5-5-4	Noranda Montanore Mine
	5-5-6	5-5-4 and 5-5-6	Noranda Montanore Mine
	5-6-7	5-6-6	Noranda Powerline
2000-2002	7-4-3	7-2-3	Berray Mtn. TS
	7-4-4	7-4-2	Berray Mtn. TS
	5-5-5	5-5-6 and 5-5-4	Noranda Montanore Mine
	5-5-6	5-5-4 and 5-5-6	Noranda Montanore Mine
	7-6-1	7-6-2 and 7-6-3	ASARCO Rock Cr Mine
	7-5-2	7-5-3	"
	7-4-7	7-4-5 and 7-4-6	"
2003-2020	7-6-1	7-6-2 and 7-6-3	ASARCO Rock Cr Mine
	7-5-2	7-5-3	"
	7-4-7	7-4-5 and 7-4-6	"
	5-5-5	5-5-6 and 5-5-4	Noranda Montanore Mine
	5-5-6	5-5-4 and 5-5-6	Noranda Montanore Mine
2021-2034	7-6-1	7-6-2 and 7-6-3	ASARCO Rock Cr Mine
	7-5-2	7-5-3	"
	7-4-7	7-4-5 and 7-4-6	"

Table 16: Displacement Habitat Acres by Elevation Zone and Aspect

Aspect	Elevation	Active Area	Displacement Area	Difference
North	< 5000'	7225	6928	- 297
	> 5000'	1812	3274	+1462
				(+1165)
West	< 5000'	12884	7888	- 4996
	>5000'	5300	5971	+671
				(- 4325)
East	< 5000'	4649	9228	+ 4570
	>5000'	1488	4624	+ 3136
				(+7715)
South	<5000'	9289	10180	+ 891
	>5000'	2695	4878	(+ 2183)
				+ 3074

Active Area = BAAs with active ASARCO project (7-4-7, 7-5-2, and 7-6-1)

Displacement **Area** = BAAs 7-6-2, 7-6-3, 7-5-3, 7-4-5, **7-4-6**

Table 17: BMU Core Displacement Habitat Acres by Elevation and Aspect Zones

BMU	Aspect	Elevation Zone	Available Acres
4	North	< 5000'	8114
		> *5000'*	2607
	East	< *5000'*	8624
		> *5000'*	3124
	South	< *5000'*	9284
		> *5000'*	4088
	West	< 5000'	9725
		> 5000'	3437

BMU	Aspect	Elevation Zone	Available Acres
5	North	< *5000'*	4274
		> *5000'*	2734
	East	< *5000'*	3694
		> *5000'*	6322
	South	< *5000'*	3438
		> *5000'*	6046
	West	< *5000'*	4197
		> 5000'	8043

BMU	Aspect	Elevation Zone	Available Acres
6	North	< 5000'	2734
		> *5000'*	2712
	East	< 5000'	5660
		> 5000'	7131
	South	< 5000'	4414
		> 5000'	4167
	West	< 5000'	4707
		> 5000'	3753

Objective 2. **Manage for an adequate distribution of bears across the ecosystem.**

Grizzly bear habitat on the Kootenai National Forest is managed according to the Bear Management Unit (BMU) concept (Christensen and Madel 1982) for purposes of managing cumulative effects of human activities. This management concept potentially provides for an adequate distribution of bears by delineating BMUs (averaging about 100 square miles) and applying specific land management guidance to ensure compatibility with grizzly bears. BMUs are further broken down into Bear Analysis Areas (BAAs) (5,000 to 15,000 acres in size) for evaluation and application of measures to ensure adequate distribution of bears. Each BAA in the Bull, St.Paul, and Wanless BMUs was analyzed for five standards to determine if the distribution objective is being met.

1. Opening size -- Proposed harvest units, either individually or in combination with existing unrecovered units should normally be designed to be ≤40 acres. Where the 40 acre limitation is exceeded for justifiable reasons, no point in the resultant opening should be more than 600 feet from cover (i.e. maximum 1200 foot opening width.)

The largest proposed opening would be 324 acres (most in MS-3 lands), from the tailing impoundment (mostly private land). The mill site would require an opening of 41 acres. The opening size objective is not met. Mitigation is designed to replace habitat lost due to large openings (see Appendix 4 and mitigation plan item B1 in Appendix 5).

2. Movement corridors -- Unharvested corridors ≥600 feet in width should be maintained between proposed harvest units and between proposed and unrecovered existing harvest units.

Timbered corridors equal to or greater than 600 feet would be maintained between all created openings.

The increased traffic level on FDR 150 (1 120% during construction and 300% during operations) would greatly reduce the effectiveness of the movement corridor between BAAs 7-6-1, 7-5-2 and 7-4-7. This reduction in corridor effectiveness would be partially offset by the required mitigation to develop a transportation plan that minimizes mine related traffic (including bussing of employees to mill site).

In addition the indirect effect of additional housing needs (see Bald Eagle effects) could further reduce the area available for bear movement to connect to habitat south of the Clark Fork River and west of the Bull River. This is because past history shows employees tend to concentrate within 30 miles of the work site. This concentration would occur in a short time frame, thus not allow time for bears to adjust to the new residences. Mortality risk would increase. Mitigation to provide replacement habitat may result in providing some secure areas for bear movement through these locations, however actual replacement habitat lands are not known at this time so there is still some risk of reducing connecting habitat. The corridor is currently significantly compromised from existing human developments and the incremental decrease in effectiveness of the corridor attributable to the project's effects are probably negligible.

The USFWS has stated that providing for adequate big game habitat in linkage zones between recovery areas is sufficent to maintain corridor habitat for the grizzly bear (USFWS 1993 pg 26). Maintaining 30% or more in security habitat (defined by Hillis et al. 1991) provides adequate protection for the grizzly bear in movement corridors outside the recovery zones. The portion of the Kootenai National Forest south of the Clark Fork contributes to the connecting corridor between the Cabinet/Yaak and the Bitterroot ecosystems. Analysis of the Clark Planning Unit, that covers this area, shows that during the spring and summer 34.6% of the area provides security habitat for big game, and thus grizzly bears. During the fall 42% of the area provides security habitat.

The draft BA indicated that a north to south movement corridor in the Cabinet Mountain portion of the CYE would be fragmented by having two large mining operations active at the same time. Additional analysis of the indirect recreational impacts and corridor assessment (see Appendices 10 & 12) shows that complete fragmentation is not likely to occur.

However, any grizzly bear with an established home range in the south half of the Cabinet Mountains would be impacted and may respond with changes in movement patterns and behaviors. At a minimum, this fracture zone (linear area of human activity that bisects grizzly habitat) would affect 31% (5 of 16) of the known grizzly bears in the CYE. The north to south movement patterns of bears would be further impacted (cumulative effect) by fracture zones created with the proposed access to three private parcels (Way-UP, Fourth of July, and Bear Lakes properties).

3. Seasonal Components -- Schedule proposed mine activities to avoid known spring habitats during the spring-use period (April 1 to June 15) and known denning habitats during the denning period (November 15 to April 1.)

Since operations are planned 7 days a week, year round, the project would not avoid activity on spring habitat during the spring use period. Although there would be indirect effects on denning habitat from projected increases in recreational activity (see Appendix 12), denning habitat would not be adversely impacted, as the high use levels would occur during the summer and early fall months before the bears move to den sites.

Habitat unit (HU) analysis was done using the CEM for grizzly (USDA FS 1988) (see Table 4 for habitat components). Early (4/1 to 7/31) and late (8/1 to 11/30) habitat unit values were calculated and the effects (physically altered or disturbed by human activity) were determined (see appendix 4 for process details). The proposed project would affect 6133.5 early HUs (2.61 HUs per acre) and 3783.5 late HUs (1.61 HUs/ac.). This equates to an over all habitat value (QHV) of 2.11 (4958.5 HUs). "In kind" replacement habitat (2,350 acres) would be required as specified in the mitigation plan (Appendix 5).

4. Open-road densities -- Refer to discussion under objective 1.

5. Displacement areas -- Refer to discussion under objective 1

Objective 3. **Manage for an acceptable level of mortality risk.**

There has been one documented grizzly bear mortality in the St. Paul BMU. The 1992 transplanted female was found dead of undetermined cause. This bear was known to have a cub of the year, which is assumed *to* be dead.

Mortality risk would increase due to the projected increase in vehicular killed deer and elk (up to 86%) that would draw bears *to* forest road 150. Vehicle traffic is projected to increase 1120% during construction (300% during operations), which increases the mortality **risk** to the bear. **A** cumulative mortality risk index (MRI) was developed (see Appendix 11). The analysis shows a relative increase of 0.2% in the MRI as a result of the proposed project.

Most human-caused grizzly bear mortalities on the Kootenai National Forest have resulted from interactions between bears and big game hunters (Kasworm and Manley 1988, pg 102). **Grizzly** bear vulnerability to human-caused mortality is partially a function of habitat security. Therefore. mortality can be partially managed by the application of standards which are designed to maintain or enhance habitat

security. These standards have previously been discussed for objectives 1 and 2: 70 percent habitat effectiveness threshold, opening size, movement corridors, cover requirements, seasonal components, and open-road density.

Peak mine employee immigration levels are estimeated to be 180 families (375 people). *An* estimated 50-100 additional families (160-180 people) are expected to move into the area that will not be employed by the mine. A portion of all these people are expected to hunt. This increases the potential mortality risk to bears. This impact is partially mitigated with the provision of and I&E position that would educate these new hunters on grizzly bear identification and the laws concerning them, with the intent to reduce illegal and mistaken identity killings.

It is important to note that human-caused grizzly bear mortality is also a function of other factors, such as the regulation of big game hunting, which are beyond the authority of the Forest Service to control. Regulation of hunting is the responsibility of the State of Montana.

Actions specifically taken in the design of this proposed project to minimize the risk of grizzly bear mortality include: 1) closure of new roads to the public during operations, followed by yearlong closure to all persons after project completion. 2) No firearms in ASARCO employee's vehicles when traveling to and from work. 3) Transportation plan (including bussing) minimizes mine related traffic. 4) Removal of dead animals from the road corridor along FDR 150 and state highway 200. and 5) Using seed mixtures that do not contain clover.

Objective 4. **Maintain/improve habitat suitability with respect to bear food production.**

There are no actions specifically taken in the design of this proposed action to maintain or improve the production of bear foods. However, mitigation does require habitat enhancement on 484 acres (see mitigation plan item B2), a portion of which may result in improvement of bear food production. Maintenance would come through "in kind" replacement for habitat lost due to physical disturbance (see mitigation plan in appendix 5, item B 1, and acre determinations in appendix 4).

Objective 5. **Meet the management direction outlined in the Interagency Grizzly Bear Guidelines (51 Federal Register 42863) for management situations 1, 2, and 3.**

The previously described Forest Plan standards and guidelines have been determined to meet the intent of the Interagency Grizzly Bear Guidelines (Buterbaugh 1991). Since the proposed project does not meet all Forest Plan standards and guidelines (specifically %HE and ORD), the intent of the Interagency Grizzly Bear Guidelines is not met, without additional measures (see measures below).

Objective 6. **Meet the terms and conditions of the amended Biological Opinion (7-27-95) on the Kootenai Forest Plan**

To meet this objective the USFWS set reasonable and prudent measures (USFWS 1995: pg 11) for: 1) open road and motorized trail density: meet Forest Plan Standards plus keep density at or below 0.75 over entire BMU. 2) Motorized trail access density: no increase. 3) Total motorized access route density: no net increase. 4) Percent of analysis area in core: no net decrease.

1) Open Road density by BAA has been displayed under objective 1 (Table 13). The ORD standard is met in all displacement BAAs that are scheduled to cover for active BMUs. In addition, the open motorized access route density for each of the entire BMUs is less than 0.75 mi./sq. mile (BMU 4 = 0.27; BMU 5 = 0.58; BMU 6 = 0.62).

2) There would be no increase in motorized trail access density. All road closures would be to ALL motorized vehicles. Closure devices would be barriers.

3) The total motorized access route density (TMARD) would remain unchanged in all BMUs. This is due to the mitigation to close an equal amount of road miles planned for construction in MS-1 lands (see mitigation plan in appendix 5).

4) Since the research is not complete, the amount of core habitat (by BMU) needed has not been established for the Cabinet Yaak ecosystem. In the interim, the USFWS set a measure requiring no net loss of core, until a standard is established. While core decreases in BMUs 5 & 6 from existing (see Table 10), core habitat levels would increase (Table 18) in BMU 4 and be maintained in BMUs 5 & 6 compared to 1999 core level (Noranda and other private land actions in operation). See Appendix 6 for maps of core habitat (by year) in each BMU. The core area impacted in BMU 5, by ASARCO Rock Creek mine, is the ventilation adit site. The location for the preferred alternative exits in a cliff. Since that site is not currently usable by the grizzly, and the noise level low (fans inside adit) there would be no loss of core habitat.

Table 18: Core Changes by BMU (*) due to ASARCO

BMU	Core %	Core Change *
4	60.9	+1.2
5	60.2	0.0
6	49.9	0.0

* Change is between 1999 (Noranda & Pvt operations assumed active - added to existing) and 2000 (ASARCO start-up added to 1999)

Statement of Findings

The proposed federal action (with mitigation in place) still **may adversely affect** the grizzly bear and its habitat based on 1) Forest Plan standards and guides for grizzly are not met, including: percent habitat effectiveness (< 70% for all 3 impacted BMUs), and ORD (> 0.75 in 1 impacted BAA); **2)** While direct Habitat loss is mitigated, there is a risk (level of uncertainty) that it may not be possible to achieve "in kind" replacement due to (a} unwilling sellers, (b} insufficient acres available in the disturbed BMUs (on site); 3) Project is active during seasonal use by bears for an extended time period thus reducing habitat suitability; 4) Connecting corridors to adjacent habitat areas (other BAAs) are impacted by increasing the width of the fracture zone along FDRs 150 and 2741; 5) Mortality Risk Index increase is small but, bearkuman encounters could still result in additional bear mortality; 6) Interagency Grizzly Bear Guidelines intent is not met ; 7) The fracture zone (created by US Highway 200 and the residences along the highway corridor) human activity level increases, due to additional housing needs for ASARCO employees, which increases the mortality risk to bears attempting to move through the linkage zone to the Bitterroot ecosystem. The above factors contribute to the likelihood of incidental take occuring above the level currently permitted under the Kootenai National Forest Plan amended

Biological Opinion and Incidental Take Statement (USFWS 7-27-95).

Potential Measures for Removing;, Avoiding, or Compensating for Adverse Effects

The analysis performed in conjunction with this Biological Assessment identified unmitigated adverse effects on the grizzly. Additional mitigation or compensation for adverse effects are: 1) to meet the intent of the Interagency Grizzly Bear Guidelines, the Mitigation Plan items need to be in place **prior to the start** of the ASARCO Rock Creek Mine. Prior implementation of measures will be commensurate with planned work (progressive) as outlined in the Mitigation Plan.

WATER HOWELLIA *(Howellia aquatilis)*

Description of Population and Habitat Status

Surveys for this species were conducted concurrent with the sensitive plant surveys (see biological evaluation of sensitive species). No occurrences of this species were found.

Water howellia grows in firm consolidated clay and organic sediments that occur in wetlands associated with ephemeral glacial pothole ponds and former river oxbows (Shelly and Moseley 1988). These wetland habitats are filled by spring rains and snowmelt runoff; and depending on temperature and precipitation, exhibit some drying during the growing season. Microhabitats for this plant include shallow water, and the edges of deep ponds that are partially surrounded by deciduous trees (Shelly and Moseley 1988; Gamon 1992; USFWS 1994). No suitable habitat exists in the planning area.

Analysis of Direct, Indirect, and Cumulative Effects

No mining or road building activities occur in suitable water howellia habitat. There would be no direct, indirect or cumulative effects to this species or its habitat.

Statement of Findings

The proposed project would have **no effect** on water howellia or its habitat, based on 1) no activities in potentially suitable habitat, and 2) no plants present.

Potential Measures for Removing, Avoiding, or Compensating for Adverse Effects

The analysis performed in conjunction with this Biological Assessment determined that the proposed action would have no affect on water howellia or its habitat. Additional mitigation is not required .

PROPOSED SPECIES ASSESSMENT

LYNX *(Lynx canadensis)*

Description of Population and Habitat Status

Currently the lynx is listed as a 'sensitive' species in Region One of the Forest Service (Jolly 1994). In compliance with a court decision the USFWS proposed to list the Lynx under the Endangered Species Act on June 30, 1998 (Federal Regester Vol. 63 No. 130 pgs 36693-37013: July 8, 1998). The population of the lynx in the western United States and specifically Montana is unknown. While northwestern Montana is considered a stronghold for lynx in the lower 48 states, populations are very low and depressed (Lori Nordstrum, United States Fish and Wildlife Service, pers. comm. with Lisa Fairman, June 5, 1995). Lynx are known to occur on the Kootenai National Forest, however there are no recent sighting reports in the Rock Creek drainage. The status of the lynx in the project area and in the Cabinet Mountains is unknown. While lynx are considered to occur, populations are probably low. Trapping records suggest this, as only three lynx were trapped in Sanders County from 1977 to 1993 and all three were taken in 1984.

Lynx are solitary animals often associated with remote areas. They often use early seral stages at high elevations for foraging and mature to old growth forests with downed trees for denning and possible foraging (Weaver 1993). The distribution and abundance of the lynx appears to be tied to the snowshoe hare, their main prey (Ruggiero et al. 1994). Open areas discourage use by lynx and disrupt movement (Koehler 1990; Koehler and Brittell 1990 *In* Ruggiero et al. 1994). They are easily trapped. Humans are considered to be the single most important mortality factor for lynx (Ward and Krebs 1985 *In* Ruggiero et al. 1994).

Range of the lynx in the western contiguous United States has diminished over the last century. Habitat is more fragmented and restricted, which may cause the lynx to be less tolerant of human activities than in Canada and Alaska where refuge habitats occur (Ruggiero et al. 1994).

Lynx information has been summarized in the Kootenai National Forest's Lynx Conservation Strategy (Johnson et al. 1997). The strategy has summarized pertinent scientific literature, developed and mapped three habitat suitability models for the Kootenai National Forest, recommended an effects analysis process, provided updates on lynx research currently being conducted on the forest, and collected available sighting information.

The Lynx Conservation Strategy provides a base for determining the status of the population in the planning unit (the KNF) and in context, the project area. The three habitat suitability models mapped estimates of suitable habitat using three data sources to adjust for strengths and weaknesses of each source. The three models agree that lynx habitat is widespread and fairly common on the northern portion of the KNF (confirmed by the more common sightings found there), and less widespread and less common on the southern portion. The limiting factor for lynx habitat appears to be foraging habitat. The project area is limited in both denning and foraging habitat because most of it is lower elevation than lynx prefer. Habitat in the Rock Creek drainage falls within KNF Lynx management unit (LMU) 7.2.1 (see Figure **BA-5).** Of the 23,017 acres in LMU 7.2.1, only 4.9% (1,134 acres) is considered denning habitat and 5.2% (1,195 acres) is considered foraging habitat. The KNF Lynx Conservation Strategy suggests a minimum of 6% denning, a minimum of 30% foraging and between 40-60% travel habitat.

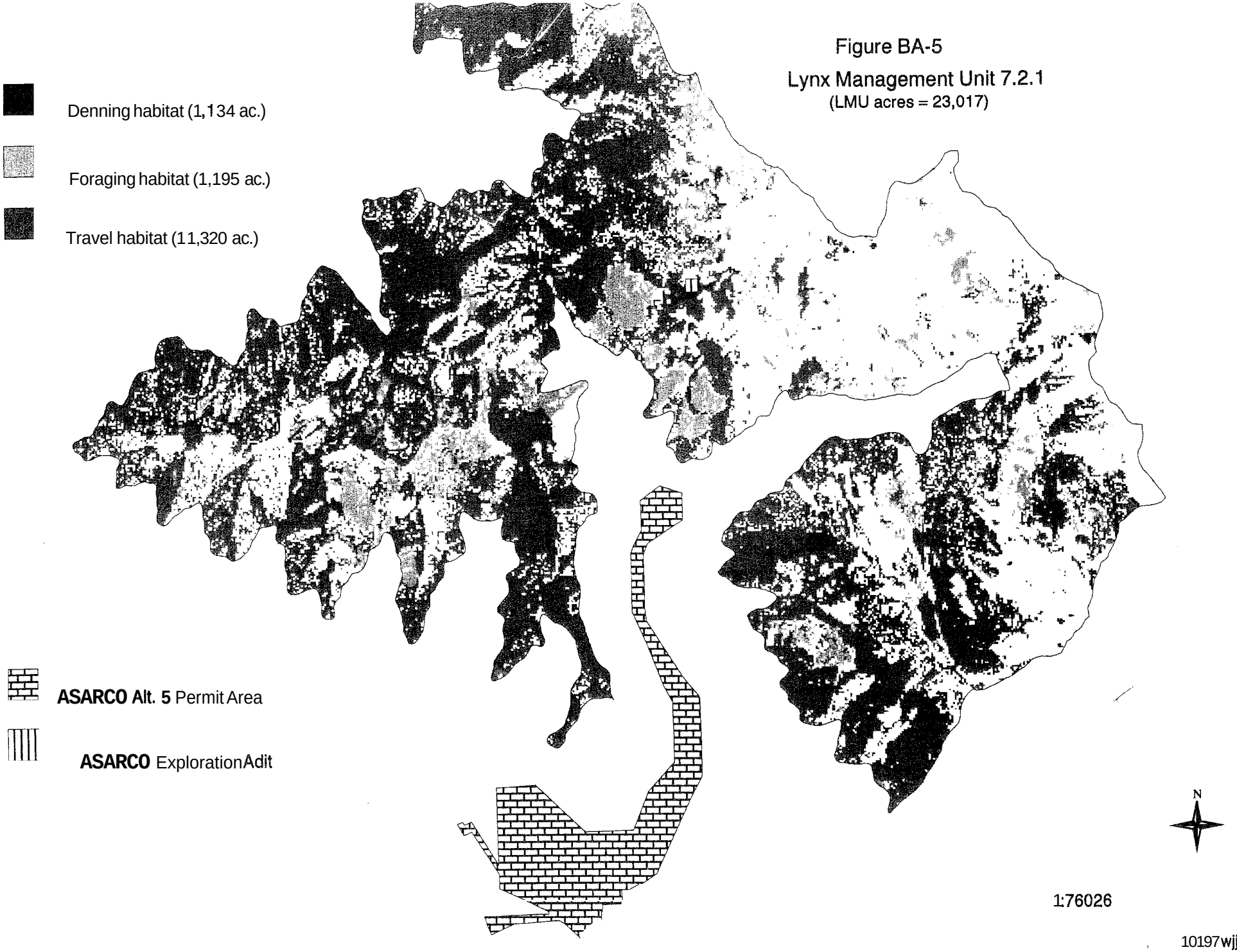


Figure BA-5
Lynx Management Unit 7.2.1
(LMU acres = 23,017)
Denning habitat (1,134 ac.)
Foraging habitat (1,195 ac.)
Travel habitat (11,320 ac.)
ASARCO Alt. 5 Permit Area
ASARCO Exploration Adit
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Foraging habitat is less common than denning habitat for the CMW portion nearest the project boundary. Because only a small amount of denning habitat is needed for denning, foraging habitat is likely the limiting factor for lynx in the adjacent CMW as well as for other areas on the forest. Linkages to adjacent national forests and drainages do not appear to be limiting because travel habitat is well represented. Roads have an effect on the ability of animals to use otherwise suitable habitat for travel. In the Rock Creek drainage, suitable habitat is well-connected with a very large tract of habitat along the CMW. The portion of the LMU nearest the Noxon connectivity corridor is primarily travel habitat rather than denning or foraging habitat.

Analysis of Direct, Indirect and Cumulative Effects

The Kootenai Cumulative Effects Model (CEM) for lynx is considered to be the most accurate model for predicting lynx habitat suitability within the project area. While the TSMRS is more accurate where a high proportion of an area has stand examinations, the CEM is considered most accurate where these exams are lacking, as in the Rock Creek project area. Using the CEM, the project area has only 3 acres of denning habitat, and 17 acres of travel habitat at the evaluation adit. Travel habitat is much less specific than either foraging or denning habitat. The low amount of habitat within the project area suggests that the reason for few lynx observations (including trapping records) within the project area and vicinity is probably lack of suitable habitat.

Busing employees and incorporation of animal-friendly crossings along FDR No.150 would reduce the mortality risk to any dispersing lynx. Mitigation proposed for grizzly bear would also function as mitigation for the minor direct loss of habitat at the evaluation adit. Alternative V is not likely to adversely impact lynx or its habitat.

Statement of Findings

As a species proposed for listing the determination is **not likely to jeopardize the continued existence of lynx** or result in the destruction or adverse modification of critical lynx habitat. This determination is based on: 1) major activity is in low elevation dispersai habitat and there is sufficient dispersal habitat to allow movement of lynx through the Rock creek drainage, **2)** direct impacts to denning and travel habitat are very minimal (3 and 17 acres respectively) and no loss of high quality forage habitat occurs, and 3) there are no recent sightings of lynx in the Rock Creek drainage.

Potential Measures for Removing, Avoiding, or Compensating, for Adverse, Effects

There are no measures required specifically for lynx. Measures designed to mitigate for effects to grizzly bear will provide benefits for the lynx (i.e. road closures, replacement habitat, bussing employees).