MINERAL RESOURCES

GEOLOGIC SETTING

Within the resource area, geology plays an important role in determining the character and distribution of many of the resources subject to this plan. Rocks spanning nearly 2 billion years of geologic time occur in the resource area; their composition includes all three major rock types - sedimentary, igneous, and metamorphic, although sedimentary rocks are predominant. The immense span of time represented by these rocks reflects periods of mountain building and erosion punctuated by numerous invasions of an island sea. Each period has left its imprint upon the character of the rocks, both in terms of composition and structure, directly affecting resources on the land.

Naturally the wide variety of mineral resources, both solid and fluid, occur as a consequence of the geologic history in northeastern Utah; but geology has a profound influence on other resources as well. Groundwater, vegetation, visual resources and recreational resources, each owe some important part of their character to the geologic setting within which they occur.

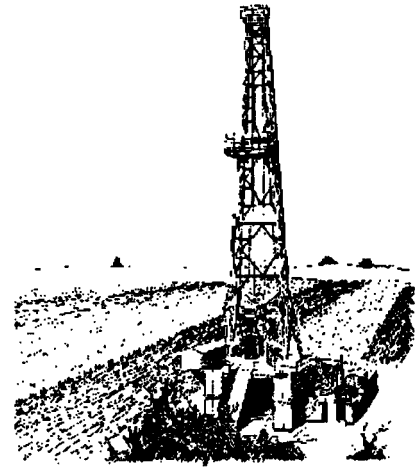
Figure 3-1 depicts the vertical succession of geologic formations within the resource area and adjacent lands in northwestern Colorado. This correlation diagram also depicts lateral variations in these formations and their age. Annotation of the figure illustrates the importance of many of the formations for fluid and solid minerals as well as other resource values. The four major subdivisions of geologic time are: the Precambrian, the Paleozoic, Mesozoic, and the Cenozoic. These subdivisions are recognizable in the rocks of the resource area by their overall character expressed by color, topographic expression, and composition. Distribution of these formations is shown in Map 3-10.

LEASABLE MINERALS

Oil and Gas

DMRA encompasses two separate oil and gas provinces: the Uinta Basin Province (Spencer and Wilson, 1988) and the Northeastern Utah-Southwestern Wyoming Basin Province (Law, 1988). The oil and gas resources in these regional provinces are significant to the local economy. To date, close to 240 million barrels of oil and 485 billion cubic feet of gas have been produced from oil and gas fields on federal, state, Indian, and private lands in the resource area (Utah Department of Natural Resources, Division of Oil, Gas and Mining, 1989) (refer to Table A4-1, Appendix 4, "Occurrence of Oil and Gas Resources"). This production is 28 percent of the cumulative state oil production and 14 percent of the cumulative state gas production. Further, it is estimated that unconventional resources, such as coal bed methane gas reservoirs and tight gas reservoirs may hold an estimated five trillion (Mayor, 1990) and 28 trillion cubic feet of gas (Spencer and Law, 1988, 1990) in the Uinta Basin, respectively.

As of 1989, approximately 692,400 public acres (81 percent) within the resource area had been leased for oil and gas exploration and production. The Clay Basin Gas Storage Unit occurs in DMRA. Approximately 2 billion cubic feet of gas were stored and recovered in 1989 from this unit.



Oil and gas resources on the BLM-administered oil and gas mineral estate are classified as having either high, moderate, or low oil and gas potential of occurrence. High potential lands are defined as those lands currently producing oil or gas or having high current industry interest. Moderate potential lands are defined as those lands which have had oil and gas indications in areas of favorable geologic conditions. Low potential areas are those lands where either the geologic conditions appear to be unfavorable for the accumulation of oil and gas or where little or no information is available to evaluate the oil and gas potential. Map 3-11 shows the distribution of high, moderate, and low potential lands in the Diamond Mountain Resource Area. The amount of BLM administered mineral estate in the high, moderate, andlow oil and gas potential areas is shown in Figure 3-2. Currently, 98 percent of the high potential lands within the resource area are under lease.

The mineral estate managed by BLM for oil and gas resources are leased through quarterly competitive oil and gas lease sales. A detailed discussion of the current BLM oil and gas leasing process appears in Appendix 4. Table 3-10 lists the number of active federal leases for oil and

FIGURE 3-1

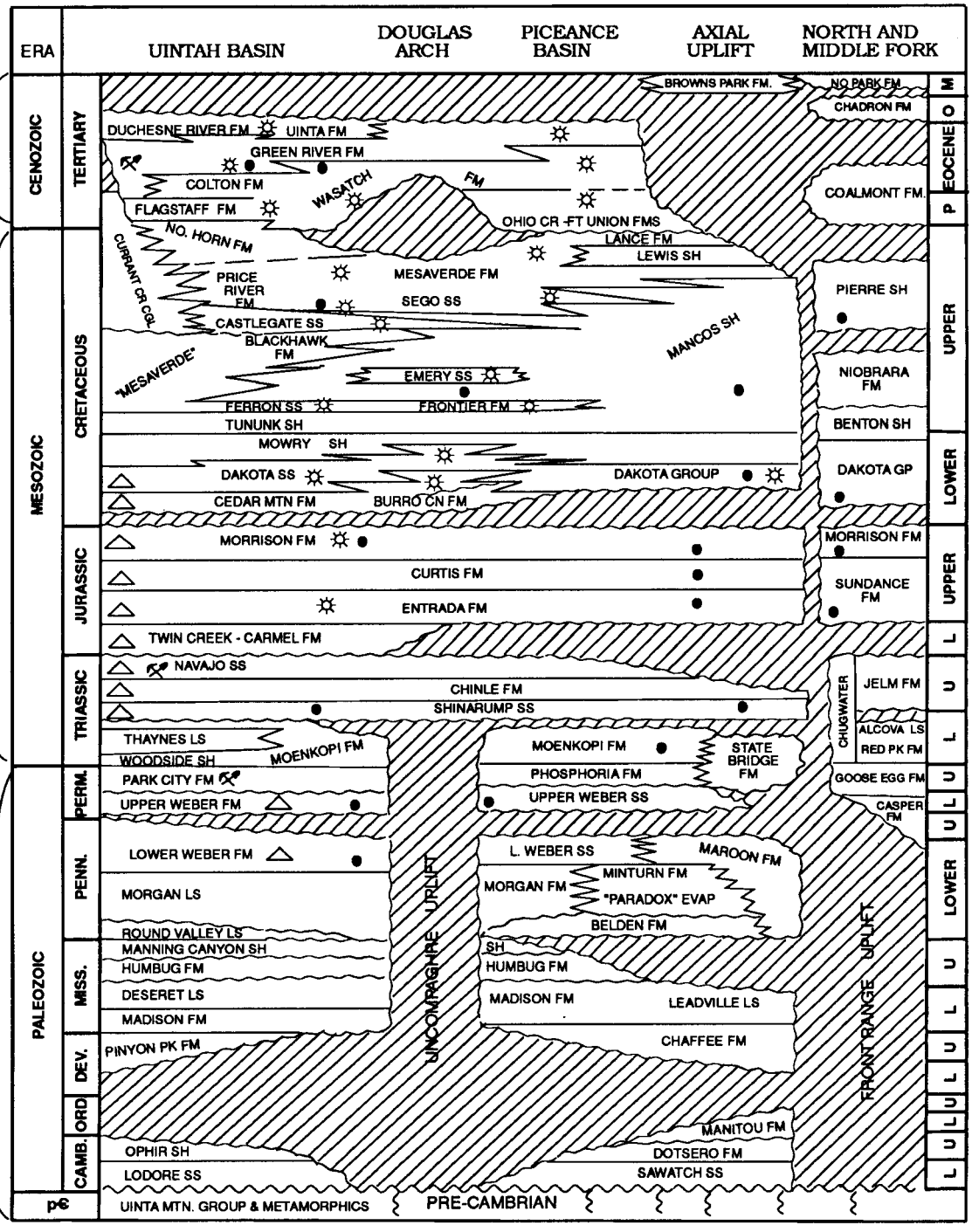
CORRELATION DIAGRAM OF GEOLOGIC FORMATIONS NORTHEAST UTAH AND NORTHWEST COLORADO

POTENTIAL RESOURCE VALUES GENERALLY OCCURRING IN EACH EON

SAND & GRAVEL
LOCATABLE MINS
OIL & GAS
OIL SHALE
GILSONITE
TAR SAND
BUILDING STONE
MAMMALIAN FOSSILS

COAL
URANIUM
TAR SAND
SLICK ROCK COUNTRY
REPTILIAN FOSSILS

BUILDING STONE
LOCATABLE MINERALS
PHOSPHATE

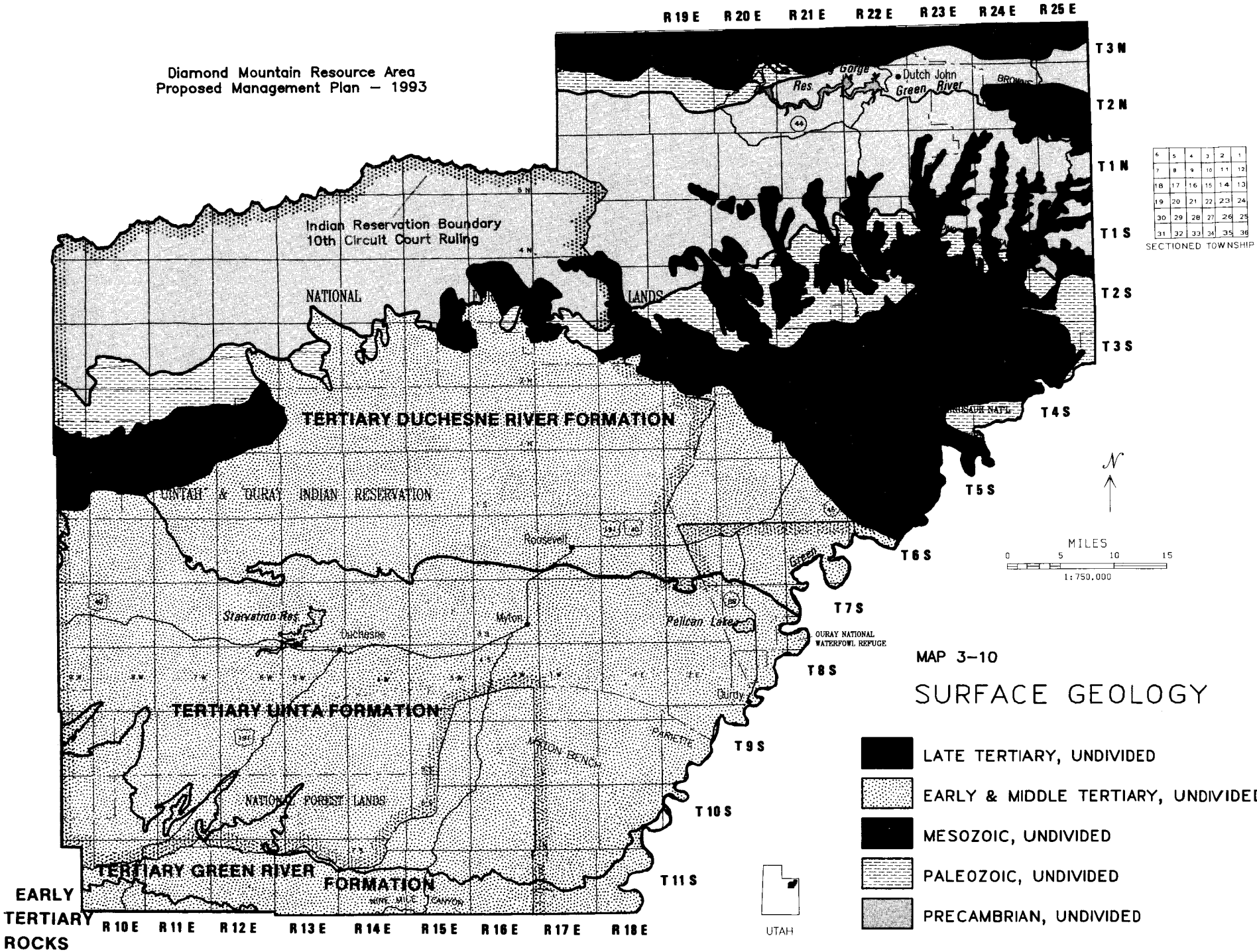


LEGEND

- ● **OIL AND GAS PRODUCTION**
- ☼ **GAS PRODUCTION**
- ⚒ **SOLID MINERAL PRODUCTION**
- △ **VISUAL RESOURCES**

LEGEND SYMBOLS INDICATE RESOURCE PRODUCTION FROM THE INDICATED FORMATION

AFTER SANBORN, 1971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Indian Reservation Boundary
10th Circuit Court Ruling
NATIONAL
LANDS
TERTIARY DUCHESNE RIVER FORMATION
UINTAH & OURAY INDIAN RESERVATION
Roosevelt
Starvation Res.
Duchesne
Myton
Pelican Lake
Ouray
OURAY NATIONAL WATERFOWL REFUGE
TERTIARY UINTA FORMATION
NATIONAL FOREST LANDS
TERTIARY GREEN RIVER FORMATION
NINE MILE CANYON
EARLY TERTIARY ROCKS
Dutch John
Green River
Res.
Gorge
SECTIONED TOWNSHIP
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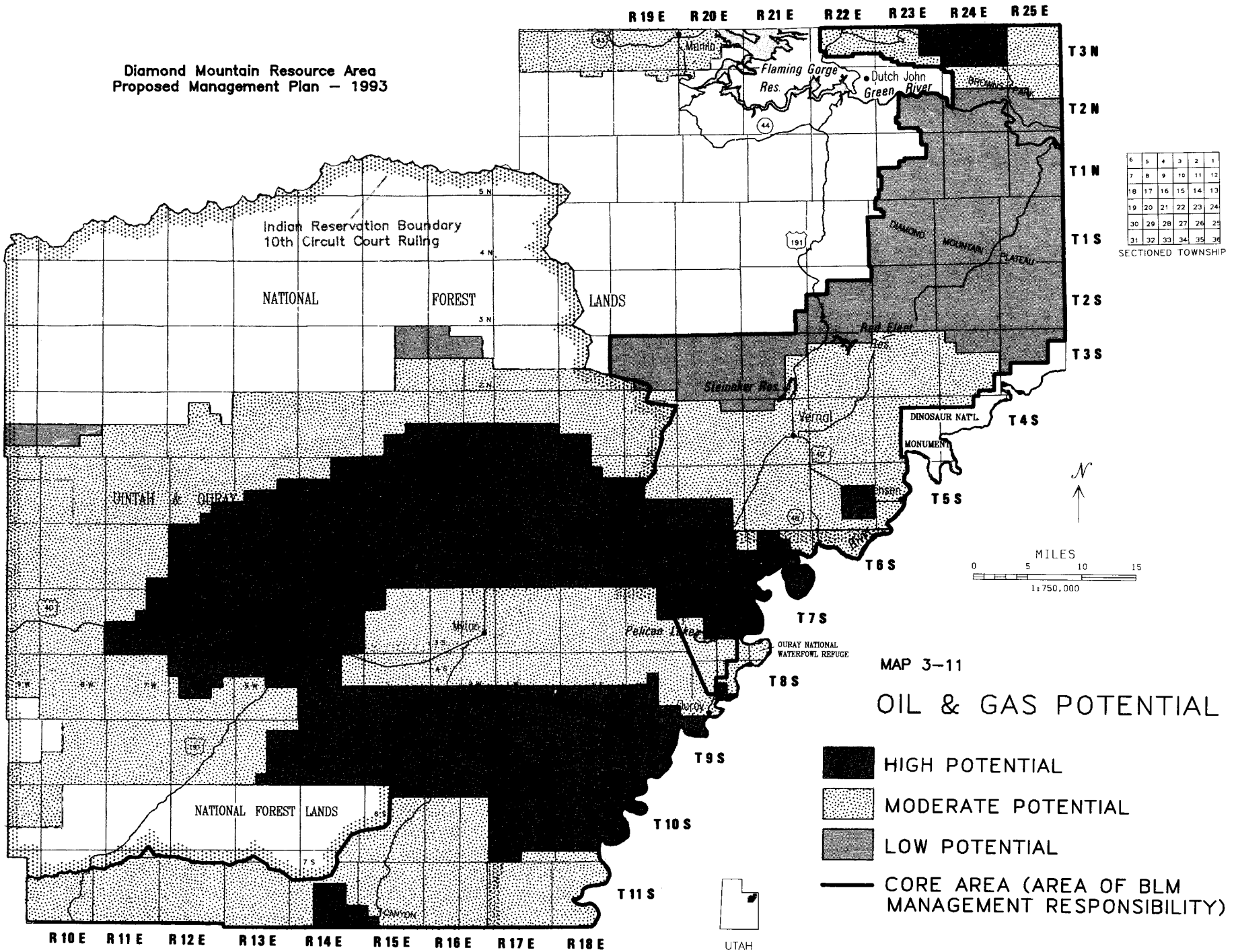
UTAH
MAP 3-10
SURFACE GEOLOGY
LATE TERTIARY, UNDIVIDED
EARLY & MIDDLE TERTIARY, UNDIVIDED
MESOZOIC, UNDIVIDED
PALEOZOIC, UNDIVIDED
PRECAMBRIAN, UNDIVIDED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Manila
Flaming Gorge Res.
Dutch John
Green River
BROWNS PARK
DIAMOND MOUNTAIN PLATEAU
Indian Reservation Boundary
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NATIONAL FOREST LANDS
Red Fleet Res.
Steinaker Res.
Vernal
DINOSAUR NAT'L MONUMENT
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OURAY NATIONAL WATERFOWL REFUGE
Ouray
NATIONAL FOREST LANDS
CANYON
UTAH
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MAP 3–11
OIL & GAS POTENTIAL
HIGH POTENTIAL
MODERATE POTENTIAL
LOW POTENTIAL
CORE AREA (AREA OF BLM MANAGEMENT RESPONSIBILITY)

gas exploration issued by BLM for DMRA. As of December 1991, the total amount of leased acreage on BLM-administered mineral estate in Daggett, Duchesne, and Uintah Counties, 99,400 acres (or 14 percent) are producing oil and gas.

The BLM-administered lands leased for oil and gas resources are placed into one of the following oil and gas leasing categories:

Figure 3-2
OIL AND GAS POTENTIAL
ON BLM SURFACE ADMINISTERED LANDS

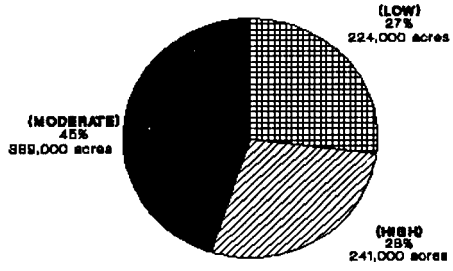


TABLE 3-10:
OIL AND GAS LEASE ACREAGE

COUNTY	*NO. LEASES	ACRES LEASED	LEASED PRODUCING ACRES
Daggett	66	82,200	7,163
Duchesne	390	334,900	37,515
Uintah	375	275,300	54,718
Total	831	692,400	99,396
* Current to December 1990			

Source: BLM Automated Lands and Minerals Record System, 1990

Category 1 - Open to leasing, subject to standard terms and conditions
Category 2 - Open to leasing, subject to seasonal or other minor constraints
Category 3 - Open to leasing, subject to "No Surface Occupancy" or other major constraints
Category 4 - Closed to leasing

Based on historical and reasonable foreseeable development, DMRA may be divided into the following five different oil and gas producing regions (refer to Map 3-12 and Appendix 4, "Reasonable Foreseeable Oil and Gas Development"): Myton Bench-Nine Mile Canyon Region, Horseshoe Bend-Ashley Valley Region, Diamond Mountain Plateau Region, Clay Basin-Manila Region, and the Indian Reservation Region.

During the period 1980-1990, 85 percent of the oil development occurred in the Myton-Nine Mile Canyon oil and gas producing region, while the predominant gas development (88 percent) occurred in the Horseshoe-Bend-Ashley Valley oil and gas producing region.

Drilling activity and seismic exploration in DMRA has decreased from the 1986 high of 97 processed "applications for permit to drill" (APDs), and 8 miles of seismic activity, to a low in 1989 of 26 APDs and no seismic activity. Such activity increased in 1990 (32 APDs and 7 miles of seismic activity) with expectations the increase will continue. Oil and gas operations including geophysical exploration are discussed thoroughly in Appendix 4, "Oil and Gas Operations".

UNCONVENTIONAL RESOURCES. Unconventional resources are defined as: oil occurring within immobile and intractable heavy oil deposits, tar deposits, or oil shales; or, gas occurring within low-permeability tight sandstone, low-permeability fractured shale reservoirs, or coal beds (Mast, et al, 1989).

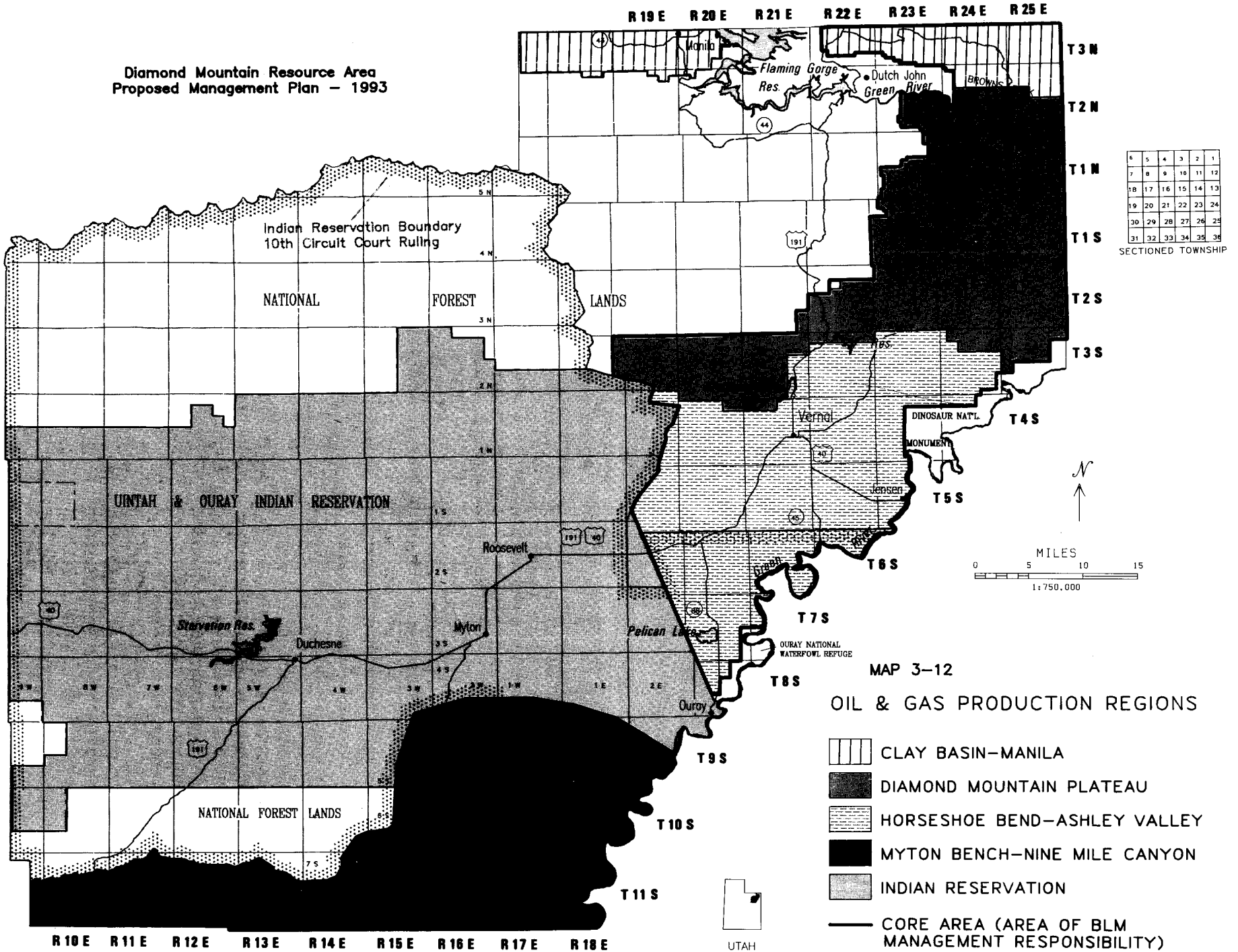
Due to this lack of mobility, oil and gas cannot be recovered using conventional development practices. Two unconventional resources (coal bed methane gas and tight gas reservoirs) occur in DMRA:

- Coal Bed Methane Gas. Coal bed methane gas is produced from fractured, buried coal seams. Estimated in-place reserves within the Uinta Basin are 5-trillion cubic feet (Mayor, 1990). Most of the current interest in coal bed methane gas extraction is outside the southern boundary of DMRA. Based on the geologic trends of the gas-bearing coal beds within the Mesa Verde Group, future exploration for coal bed methane gas may extend into the Nine Mile Canyon area.

- Tight Gas Reservoirs. Tight gas reservoirs are those gas-bearing rocks having low permeabilities (Spencer and Law 1990; Spencer, 1989). Artificial stimulation of the reservoir, such as hydraulic fracturing of the formation, is usually needed in order to produce the gas.

- Tar Sands. See following subsection.

The U.S. Geological Survey and the Department of Energy have identified the Uinta Basin and the Green River Basin among those basins having the greatest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Flaming Gorge Res.
Dutch John
Green River
Brown's
Indian Reservation Boundary
10th Circuit Court Ruling
NATIONAL FOREST LANDS
UINTAH & OURAY INDIAN RESERVATION
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DINOSAUR NAT'L MONUMENT
Jensen
Roosevelt
Green River
Starvation Res.
Duchesne
Myton
Pelican Lake
OURAY NATIONAL WATERFOWL REFUGE
Ouray
NATIONAL FOREST LANDS
SECTIONED TOWNSHIP
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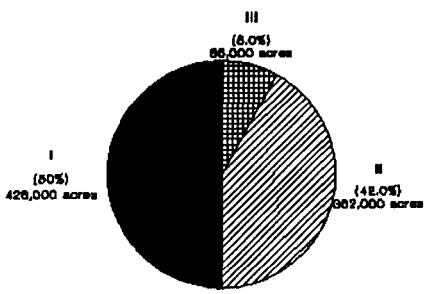
UTAH
MAP 3–12
OIL & GAS PRODUCTION REGIONS
CLAY BASIN–MANILA
DIAMOND MOUNTAIN PLATEAU
HORSESHOE BEND–ASHLEY VALLEY
MYTON BENCH–NINE MILE CANYON
INDIAN RESERVATION
CORE AREA (AREA OF BLM MANAGEMENT RESPONSIBILITY)

resource potential for tight gas sandstone reservoirs. The U.S. Geological Survey estimates the Tertiary and Cretaceous sandstone tight gas reservoirs in the Uinta Basin may contain from 5- to 28-trillion cubic feet of gas (Law, et al., 1986 and Spencer and Law, 1988, 1990).

Tight gas sandstone reservoirs are producing gas in the Uinta Basin (Mesa Verde Group and Wasatch Formation) and in the Clay Basin (Mesa Verde Group) (Law, et al., 1986). The State of Utah and the U.S. Geological Survey have designated sandstone reservoirs in the Wasatch Formation and the Mesa Verde Group as tight gas sandstone reservoirs in DMRA.

Figure 3-3 identifies the current amount of BLM-administered mineral estate placed in each of the categories. No category 4 areas currently exist within the resource area.

Figure 3-3
OIL AND GAS LEASING CATEGORY TYPES GENERAL



CONVENTIONAL RESOURCES. Oil and gas resources in DMRA are both conventional and unconventional. Conventional oil and gas resources, discussed here include crude oil, natural gas, and natural gas liquids that exist in conventional reservoirs or in a fluid state suitable for recovery using traditional development practices (Mast, et al., 1989).

The occurrence of oil and gas resources in DMRA is controlled by the presence of reservoir rocks, source rocks, and oil/gas traps. Fields and prospects may be grouped into "plays" having similar reservoirs, traps, source rocks and geologic histories. Appendix 4 discusses the occurrence and habitat of oil and gas resources within DMRA.

Tar Sands

A tar sand deposit may be characterized as a body (or bodies) of porous rock, saturated by very thick immobile hydrocarbon compounds (bitumen) which cannot be recovered by conventional oil producing methods. Yet bitumen in tar sands sometimes may be recovered by conventional mining methods. In some instances, the resource may be recovered in place, using direct application of heat or solvents.

Tar sand deposits in Utah are among the most notable deposits of North America, accounting for nearly 95 percent of North America's resources, with an estimated 25 billion barrels of bitumen in place (Campbell, 1975). Within the resource area there are four important deposits: the Asphalt Ridge-White Rocks Deposit; the Pariette Deposit, the Sunnyside Deposit (northern portion), and the Argyle Canyon-Willow Creek Deposit. The Asphalt Ridge-White Rocks deposit, found west of Vernal, ranks among the most important of the Utah deposits (BLM, 1984b). The remaining three deposits rank lower, but are still important for their oil and gas potential.

In the early 1980s, at the request of congress, eleven of the richest Utah tar sand deposits were designated as Special Tar Sand Areas (STSAs) by the Mineral Management Service. Four of these STSAs cover the deposits identified previously. In general, the areas included within STSAs have the highest potential for the occurrence and development of tar sands. In addition, some of these STSAs fall within lands having significant potential for conventional oil and gas deposits. These include the Argyle Canyon-Willow Creek, Sunnyside, and Pariette STSAs. Table 3-11 provides reserve estimates for the deposits in the resource area.

Total acreage of lands in these STSAs is approximately 123,000 acres. Of this total, only 66,200 acres include oil and gas and bitumen reserved to the federal government. A portion of the Asphalt Ridge area are under tar sand placer claims which predate the Mineral Leasing Act.

Resource area tar sands are found in host rocks which mostly include Tertiary sediments of the Green River, Uinta, and Duchesne River Formations. The White Rocks deposit is in the older Jurassic Glen Canyon Sandstone. The Eocene Green River Formation is regarded as the principal source rock for the bitumen in all of the Uinta Basin deposits including the White Rocks deposit.

Tar sand deposits on Asphalt Ridge currently are being mined by Uintah County for road paving materials. Duchesne County also has expressed interest in the Pariette and Argyle Canyon STSAs for their anticipated road paving projects. Processing is required to bring the

TABLE 3-11:
ESTIMATED RESOURCES IN DMRA, SPECIAL TAR SAND AREAS

SPECIAL TAR SAND AREA	ESTIMATED IN-PLACE RESOURCES (BBLS)
Argyle Canyon/Willow Creek	60-90 million
Asphalt Ridge/White Rocks	1.22-1.31 billion
Pariette	12-15 million
Sunnyside	1.5-4 billion*
*Figure includes reserves for both the northern and southern portions of the STSA. The southern portion of the STSA is located in the Price R.A.	

Source: BLM, 1984b

product up to engineering standards required for state and federal highways. This would generally be true of all deposits in the resource area.

There was significant interest in tar sands during the energy "boom" of the early 1980s. Current interest is ongoing but low by comparison, centering on experimental recovery methods on pilot areas.

There are currently three authorized Combined Hydrocarbon Leases (CHLs) in the resource area covering about 2,800 acres. The leases are located within the Pariette, Sunnyside (northern portion), and Asphalt Ridge-White Rocks Canyon STSAs. The Pariette and Sunnyside STSAs are attractive primarily for their oil and gas potential. Therefore, development on the leases in those STSAs would most likely be for oil and gas, but development on the lease in White Rocks would be for tar sand.

Phosphate

Minable deposits of phosphate occur on both the north and south flanks of the eastern Uinta Mountains. The best deposits are located near Flaming Gorge and Vernal.

Deposits in the Flaming Gorge Field are the least attractive of the two because of a complex geologic structural setting and greater conflicts with other land uses. Little, if any, of the phosphate deposit in this field occurs at or near the surface of lands subject to this plan.

Of the two fields, the Vernal Field is most attractive for future development. Extensive areas of relatively high grade deposits occur at or near the surface. This makes these areas especially attractive for low cost strip mining. By present day technology, the Vernal deposit is only marginally economical; however, increases in demand over the next 20 years could significantly increase prices. A price increase would allow economic development by both strip mining and underground mining methods.

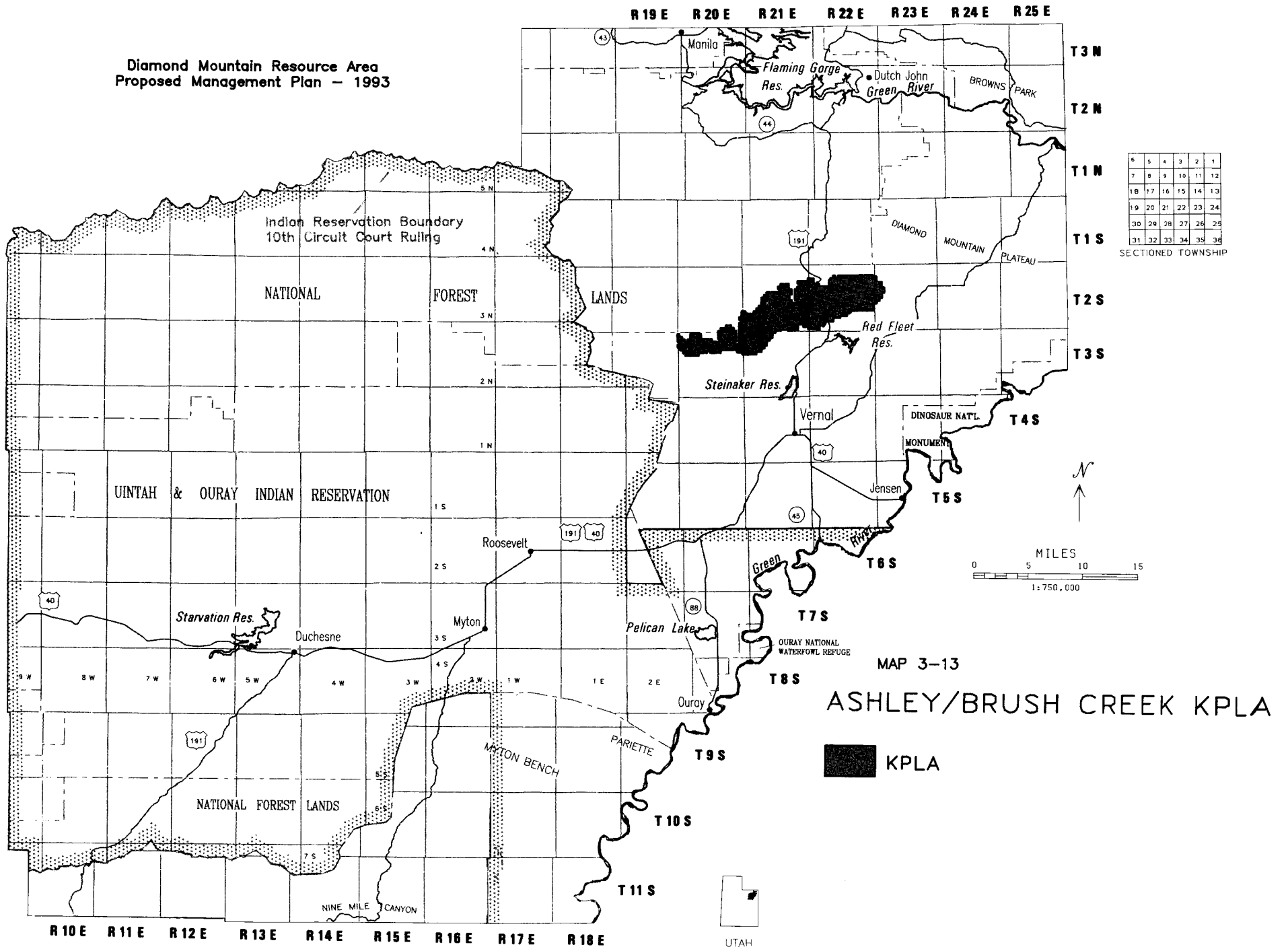
The Vernal Field includes the Ashley-Brush Creek Known Phosphate Leasing Area (KPLA) (refer to Map 3-13) where the only active phosphate mine in the state is located. Surface and near-surface outcrops of the phosphatic Meade Peak Member of the Permian Park City Formation, exist along the south-facing slopes of the Uintas, from Dry Fork to Split Mountain. The best quality deposits are located between Ashley Creek and the west edge of Diamond Mountain Plateau, just east of Little Brush Creek. In the KPLA, there are about 19,500 acres of federal subsurface minerals, of which approximately 63 percent is managed by other federal agencies. The remainder of the KPLA, about 18,800 acres, consists of non-federal mineral estate, not subject to federal leasing. This KPLA includes lands having both the highest potential of occurrence and highest potential for development in the resource area.

There are two pending prospecting permit areas in DMRA, totaling about 1,900 acres. Seventeen (17) of these permit areas are no longer active. There are three presently inactive Preference Right Leases within the resource area totaling about 4,000 acres. There is one authorized competitive lease in the resource area totaling about 2,300 acres and it too is inactive.

The resource area has four non-competitive leases, totaling of 5,800 acres. These leases are believed to be the areas that would be developed over the life of this plan.

"Gilsonite"

"Gilsonite" is a black, pitch-like substance which occurs in pure form in veins in the Tertiary sediments of the Uinta Basin. It is a petroleum substance of uniform composition and texture. It dissolves into resins and dying oils in all proportions, and is also mixable with petroleum and other asphaltic materials. "Gilsonite" compounds are often quite strong and offer resistance to heat, acids, and alkalies, making them valuable for weatherproofing (Stern, 1960).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MAP 3–13
ASHLEY/BRUSH CREEK KPLA
KPLA

The Uinta Basin is the principle source of "Gilsonite" in the world. Minor occurrences within the Uinta Basin extend into Colorado.

The best known and currently most productive "Gilsonite" dikes occur in three groups east of the Green River within the Book Cliffs Resource Area. Across the Green River in DMRA, the number of veins exposed at the surface drops considerably. These tend to be shorter, narrower, and of lesser overall quality than their eastern basin counterparts. Only a few of these veins exist in the DMRA core area.

The overall decrease in vein size and "Gilsonite" quality within DMRA is attributed to a change in host rock, as the composition of the Uinta Formation changes from a uniform sandstone to weaker, shaley units. The "Gilsonite" veins also penetrate upward and downward into the beds of adjacent formations. Known veins in the Duchesne River Formation are relatively few, yet "Gilsonite" potential may still be quite high along southern exposures of this formation. Significant occurrences may lay hidden from view beneath the Duchesne River Formation in the more suitable host rocks of the Uinta Formation below. Likewise, "Gilsonite" occurrence below the Uinta Formation, in the Green River Formation are known. The degree to which "Gilsonite occurs in the formations above and below the Uinta Formation is unknown. To date, commercial interest has focused solely upon the most accessible deposits.

Map 3-14 shows "Gilsonite" potential on federal minerals within the resource area. The lands with the highest "Gilsonite" potential in the resource area are associated with known "Gilsonite" veins. These are lands within two miles of known veins. The total number of federal acres in these high potential areas is 38,350. In addition, there are about 149,500 acres of additional high potential mineral estate outside of the buffers, and 133,500 acres of moderate potential mineral estate in addition to this. The remainder of the resource area is considered to have no, or very low, potential for "Gilsonite".

"Gilsonite" is allocated by non-competitive (preference right) and competitive leasing only. Leasing actions are initiated by public interest or by the Bureau; additionally prospecting permits may be applied for by the public. Currently, there are no active lease or permits for "Gilsonite" within the resource area.

As the higher grade deposits of the eastern basin are exhausted, the poorer deposits of the west basin will become more attractive to mining. As supply from the high grade veins diminishes, there will be additional incentive to explore frontier areas more aggressively (personal communication, Lekas, Geokinetics, 1990). High "Gilsonite" potential federal lands in DMRA, will be important in maintaining the industry in the future.

LOCATABLE MINERALS

Locatable minerals activity in the resource area is considered insignificant when compared with higher levels of locatable minerals development activity in other parts of the western United States. This is partly because the resource area was never exposed to the kinds of geologic activity commonly associated with lode deposits. These could include deposits of metals such as gold, silver, copper, and others. Placer deposits, having their origin in lode deposits, are also rare in the resource area. Other varieties of locatable minerals like uranium, silicon, iron, and gypsum, occur in small isolated deposits throughout the resource area, but none may be characterized as significant.

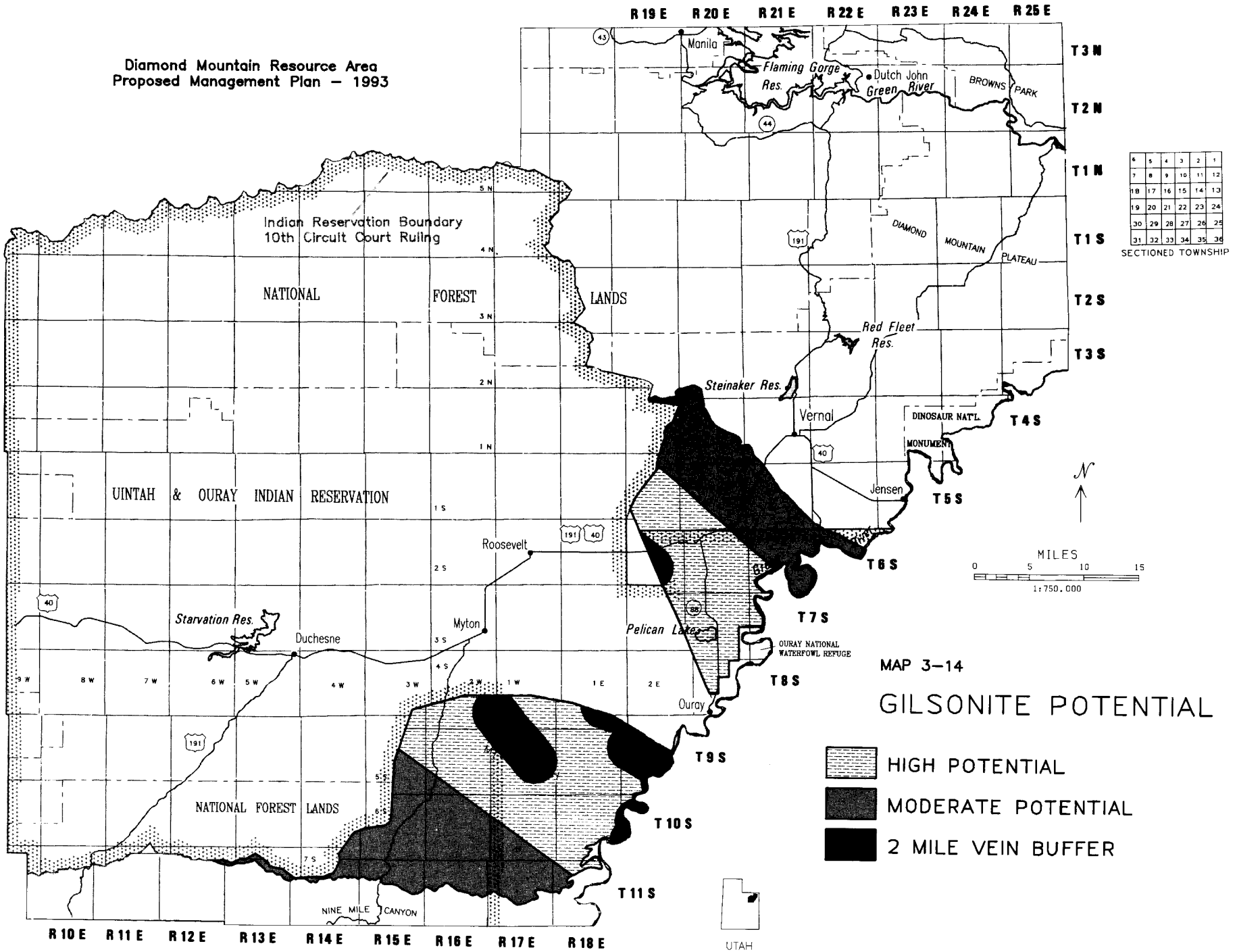
Of the lode (base metal) deposits occurring here, the most important of these occur in rocks of Precambrian age located in the mountains north of Browns Park. Others occur in outcrops which form a ridgeline of limestone hills on the southern edge of Diamond Mountain Plateau.

Although placer deposits of fine gold do occur in alluvium along the Green River and on elevated alluvial terraces on the east side of Ashley Valley, the deposits on the Green River have the highest development potential in the future. Operators are now taking advantage of developments in new extraction techniques, working at a handful of marginally profitable operations on private lands along the river.

Minor occurrences of radioactive minerals occur in the Morrison and Uinta Formations and in the Mesa Verde Group. However, recent studies by the Department of Energy conclude that, although occurrence potential is high, it is unlikely that beds of economic importance occur in the resource area (Craig, 1982).

The lands in the resource area considered to have the highest potential for development include the Precambrian outcrops north of Browns Park and the alluvial deposits on the Green River. Table 3-12 summarizes development potential for these lands. Lands listed with moderate or low development potential are not likely to see development during the next two decades. Map 3-15 shows development potential in the planning area.

Public interest in locatable minerals remains somewhat high, particularly for placer minerals. Mining claim distribution provides a good measure of this interest. The public's interest in locatable minerals is most likely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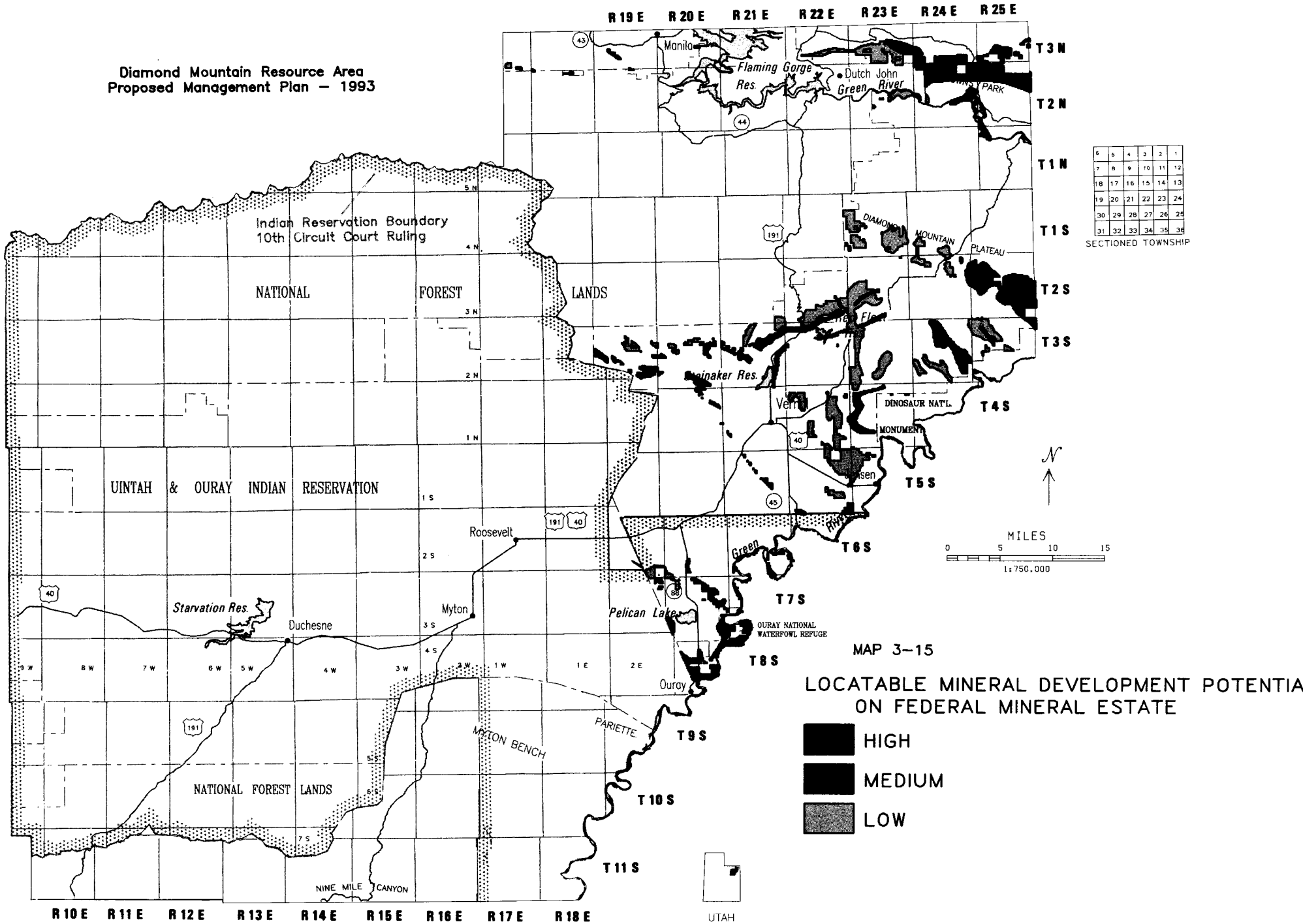
MAP 3–14
GILSONITE POTENTIAL
HIGH POTENTIAL
MODERATE POTENTIAL
2 MILE VEIN BUFFER


Diamond Mountain Resource Area
Proposed Management Plan – 1993
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Manila
Flaming Gorge Res.
Dutch John
Green River
DINOSAUR NAT'L. MONUMENT
DIAMOND MOUNTAIN PLATEAU
Indian Reservation Boundary
10th Circuit Court Ruling
NATIONAL FOREST LANDS
UINTAH & OURAY INDIAN RESERVATION
Roosevelt
Duchesne
Myton
Starvation Res.
Pelican Lake
Ouray
OURAY NATIONAL WATERFOWL REFUGE
MYTON BENCH
PARIETTE
NATIONAL FOREST LANDS
NINE MILE CANYON
SECTIONED TOWNSHIP
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UTAH
MAP 3–15
LOCATABLE MINERAL DEVELOPMENT POTENTIAL
ON FEDERAL MINERAL ESTATE
HIGH
MEDIUM
LOW

founded in speculation and in some cases the simple notion of discovery or potential for such. Maps 3-16 and 3-17, respectively show mining claim distribution for approximately 2,690 lode and placer mining claims within the tri-county area. Table 3-13 includes a summary of claim type and status through 1990.

TABLE 3-12:
LOCATABLE MINERAL DEVELOPMENT POTENTIAL ON FEDERAL MINERAL ESTATE

COMMODITY	DEVELOPMENT POTENTIAL	FEDERAL MINERAL ACRES	PERCENT OF R.A.
Metals	High	14,540	1.7
	Moderate	12,200	1.4
	Low		
Non-Metals	High	10,650	1.3
	Moderate		
	Low		
Containing Uranium	High	15,300	1.8
	Moderate	4,800	.6
	Low		
Placer	High	34,500	0.4
	Moderate		
	Low	23,800	2.8
Total:		*84,740	10.0

Source: DMRA Geographic Information System
*NOTE: Some of these lands are inside the oil shale withdrawal and would not be developed while the withdrawal is in place.

Tar sands and oil shale were once considered locatable minerals and staked as placer claims subject to the 1872 General Mining Law. Now both are subject to leasing laws and are closed to location. However, two large blocks of claims cover federal mineral estate containing these minerals, in or adjacent to, the resource area. One is associated with tar sand deposits along Asphalt Ridge. The other, for oil shale, is located in the extreme southwest corner of Duchesne County on National Forest lands, located generally in townships 9, 10, and 11 south, ranges 10, 11, and 12 east, identified on Map 3-18.

TABLE 3-13:
MINING CLAIMS OCCURRING WITHIN DMRA

CLAIM TYPE	NUMBER OF CLAIMS	
	OPEN	CLOSED
Lode	1,557	2,883
Placer	660	487
Mill Site	473	244
Tunnel	3	0
All Types	2,693	3,614

Source: BLM Mining Claim Database Records, 1990

It should be noted that Executive Order 5327 and Public Land Order 4522, commonly referred to as the Oil Shale Withdrawal, have closed most of the south half of the resource area to the staking of mining claims or operations under the mining law.

MINERAL MATERIALS

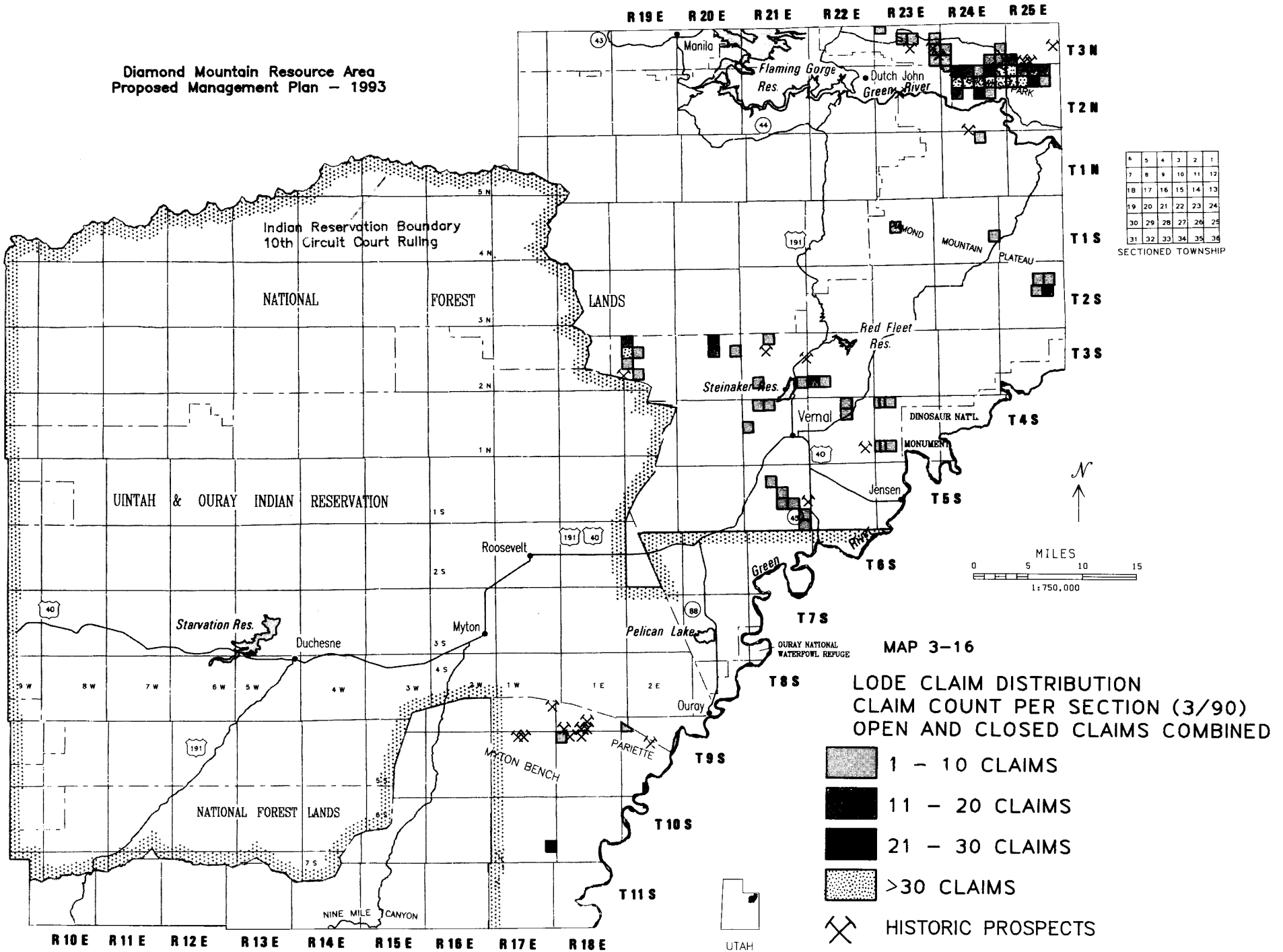
Within the resource area, occurrence of mineral materials varies with surface geology and topography. Streams with head waters in the Uinta Mountains yield the best quality sand and gravel deposits. Outcrops of highly resistant metamorphic and carbonate rocks occur throughout the mountains and provide excellent sources of sand and gravel.

Conversely, streams with head waters in the Uinta Basin itself, tend to yield poor quality sand and gravel due to the poor quality source rock. However, high quality sources of building stone do occur in the basin. Thin sandstones of the Green River Formation are important examples of this. Therefore, in their own respects, both the mountains and the basin have significant potential for mineral materials.

Of the 814,200 acres of federal mineral estate open to the disposal of mineral materials, only 76,290 acres (9 percent) have high development potential. These are lands most likely for development over the life of this plan. Map 3-18 depicts these lands.

County governments provide road maintenance over large areas of the resource area, often at significant expense. A network of well-placed material sites throughout the resource area helps to keep these costs as low as possible. Since federal lands cover such large areas, the county governments depend upon BLM for sites in remote areas.

There are two categories of mineral material disposal: exclusive and nonexclusive. Under exclusive disposals (i.e., negotiated and competitive sales and free use), the applicant has exclusive rights to the materials applied for and sole responsibility for the development and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PARIETTE
NINE MILE CANYON
MOUNTAIN PLATEAU
SECTIONED TOWNSHIP
MILES
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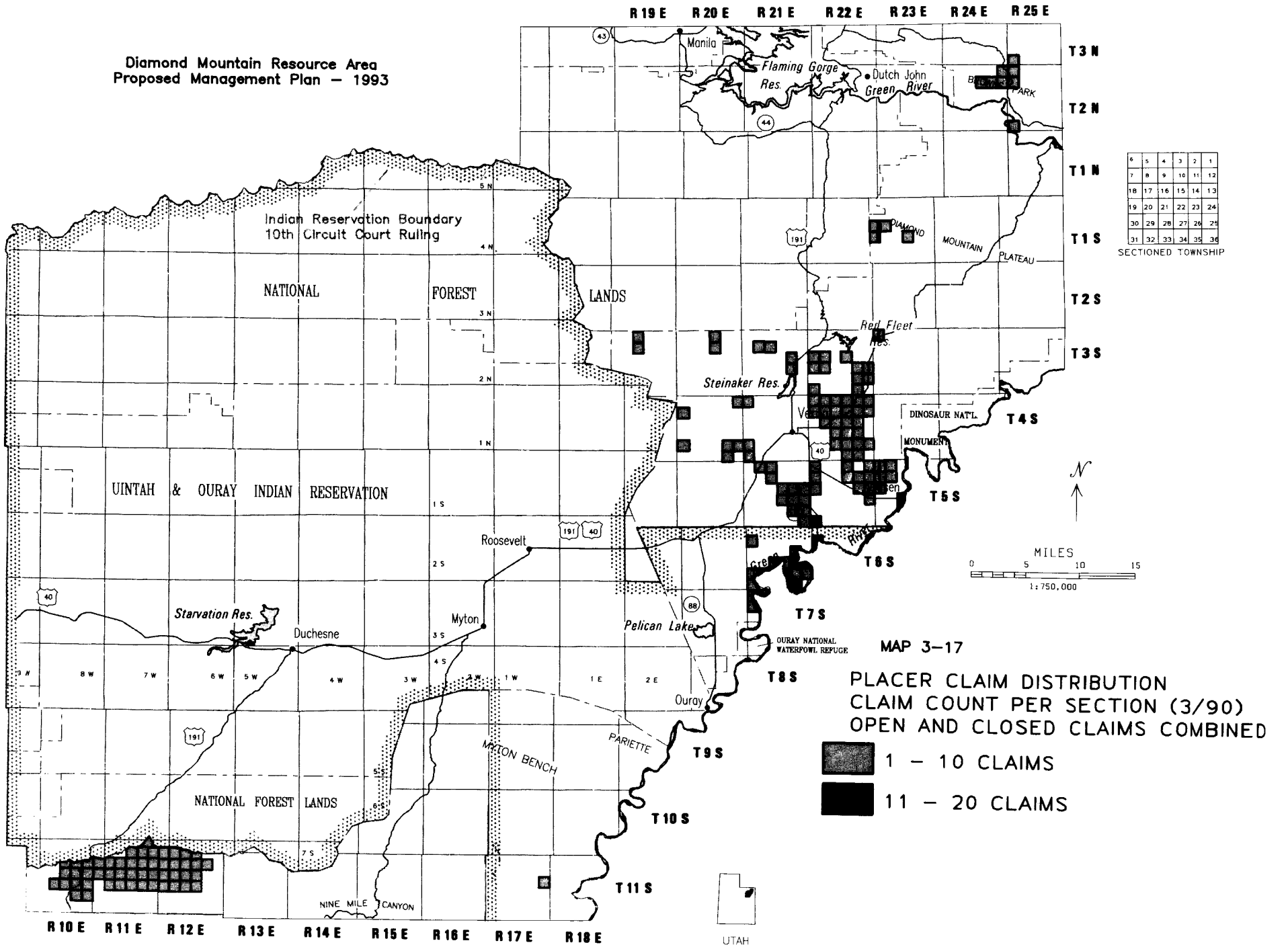
1:750,000
UTAH
MAP 3-16
LODE CLAIM DISTRIBUTION
CLAIM COUNT PER SECTION (3/90)
OPEN AND CLOSED CLAIMS COMBINED
1 – 10 CLAIMS
11 – 20 CLAIMS
21 – 30 CLAIMS
>30 CLAIMS
HISTORIC PROSPECTS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SECTIONED TOWNSHIP
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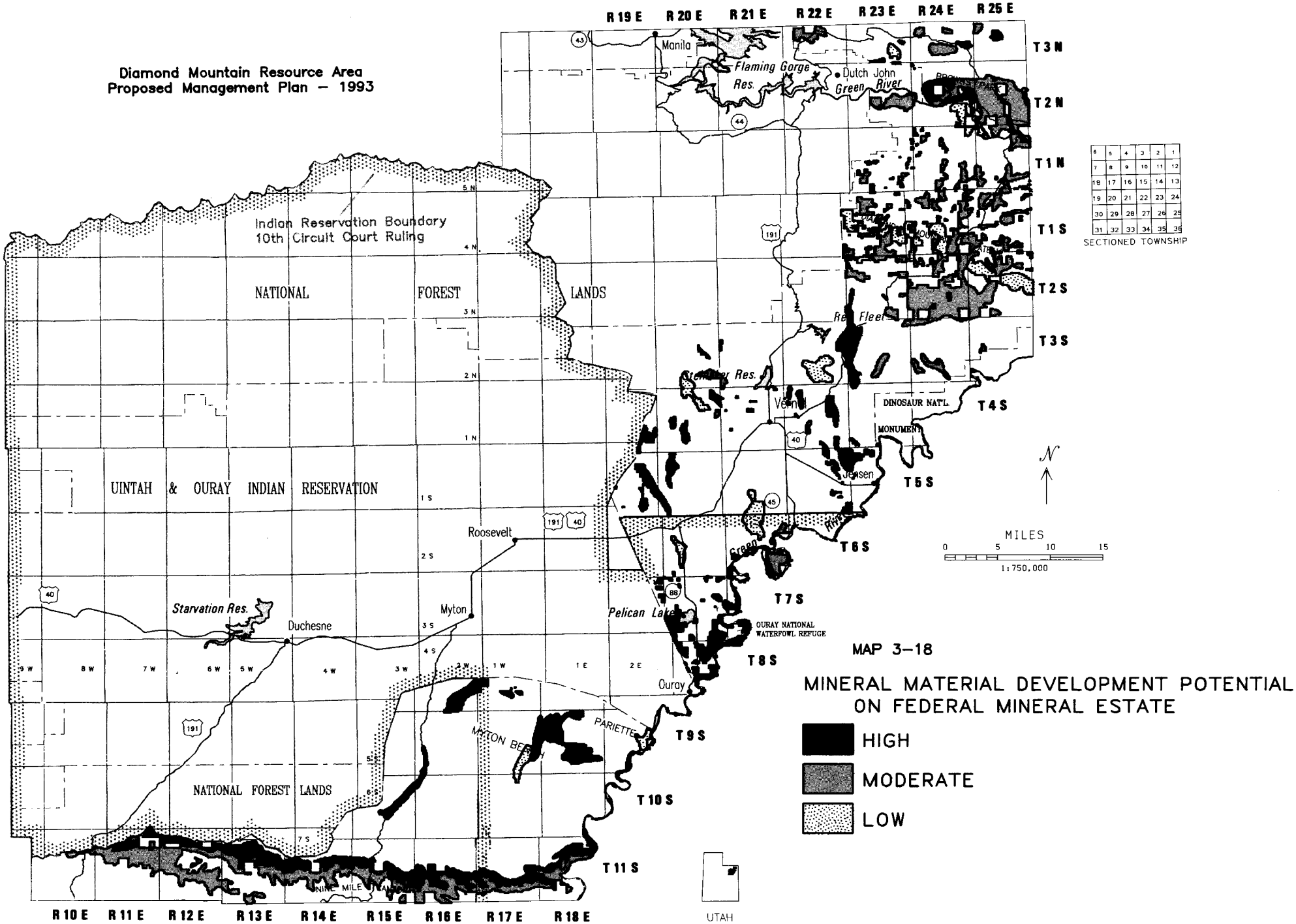
MAP 3–17
PLACER CLAIM DISTRIBUTION
CLAIM COUNT PER SECTION (3/90)
OPEN AND CLOSED CLAIMS COMBINED
1 – 10 CLAIMS
11 – 20 CLAIMS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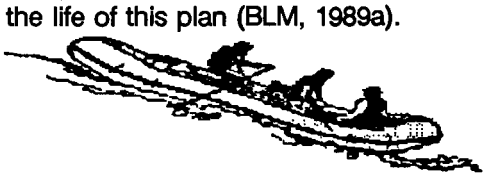
MAP 3–18
MINERAL MATERIAL DEVELOPMENT POTENTIAL
ON FEDERAL MINERAL ESTATE
HIGH
MODERATE
LOW

reclamation of the source site. Currently there are only negotiated sale sites, free use permits, and one community pit site near Wild Mountain active within the resource area. The public has access to nonexclusive disposal sites (i.e., community pits and common use areas). In the resource area, there are both types of nonexclusive sites. The Wrinkles Road building stone common use area covers about 30,800 acres. Agreements allow disposal of materials from some free use permit sites to the public under provisions similar to those provided for disposal from community pits.

RECREATION

The resource area offers a wide variety of topography, terrain features, vegetation, scenic values, historic resources, wildlife and riparian resources. These all combine to make northeastern Utah, and thus DMRA, a valuable region for a myriad of recreational pursuits. Visitors wishing to enjoy a recreation experience on public lands may choose from camping in developed campgrounds along the Green River in Browns Park, travelling scenic highways and back-country byways, or primitive and unconfined activities throughout the resource area.

This wide variety for recreation opportunities should draw an increasing number of visitors to the resource area through the life of this plan (BLM, 1989a).



RECREATION OPPORTUNITY SPECTRUM

BLM uses the Recreation Opportunity Spectrum (ROS) as one tool to identify types of recreation settings and opportunities. It also helps identify the capability of public land to provide specific types of recreation experiences. Impacts to specific ROS classes can be used to identify and quantify effects of various activities to different types of recreation opportunities. Appendix 5 cites the factors considered for each ROS class.

To facilitate its use in planning the ROS is divided into the following six classes, listed in order of importance, from high to low: Primitive; semi-primitive nonmotorized; semi-primitive motorized; roaded natural; rural and, modern urban. ROS classes in DMRA were established as a result of an inventory conducted in 1980 and updated in 1990. Map 3-19 indicates locations of various ROS classes in the resource area. Table 3-14 cites the approximate acres in each class.

RECREATION MANAGEMENT AREAS

Special Recreation Management Areas (SRMAs) are areas heavily used for recreation. They require special management to ensure the protection of identified recreation values. Two areas are currently designated SRMAs: Browns Park (about 18,650 public acres) and Pelican Lake (about 1,060 public acres). Refer to Map 3-20 for these SRMAs locations.

TABLE 3-14:
RECREATION OPPORTUNITY SPECTRUM

OPPORTUNITY CLASSES	PUBLIC ACRES
Primitive	0
Semi-Primitive, Non-Motorized	60,776
Semi-Primitive, Motorized	513,662
Roaded Natural	114,956
Rural	19,606
Urban	0
Area Total	709,000

Source: DMRA Geographic Information System

In 1984, the Browns Park SRMA was designated as the Green River Scenic Corridor Area of Critical Environmental Concern (ACEC). This action was taken to protect scenic, historic, cultural, biologic, and scientific values. A 1991 interagency review of recreational use of the Green River from Flaming Gorge Dam to the Colorado state line anticipates recreation pressure to continue to increase at approximately 3-4 percent per year.

Suggestions for maintaining the high quality recreation experiences include: increased and improved recreational facilities along the river, and implementing a reservation system for use on the river (Pratt, et al., 1991).

The remainder of DMRA, not included in the SRMAs, is included in the Diamond Mountain Extensive Recreation Management Area (ERMA). Recreational pursuits center around unconfined activities such as hunting, fishing, sightseeing, and off-highway driving. Two exceptions are found in Dry Fork Canyon and Sand Wash.

Public land along Dry Fork Creek, in scenic Dry Fork Canyon near Vernal, contains a small picnic area, heavily used in the spring of the year. BLM operates a ranger station at Sand Wash on the Green River near Nine Mile Canyon. It is the main launch point for raft trips down the Green River through Gray and Desolation Canyons.