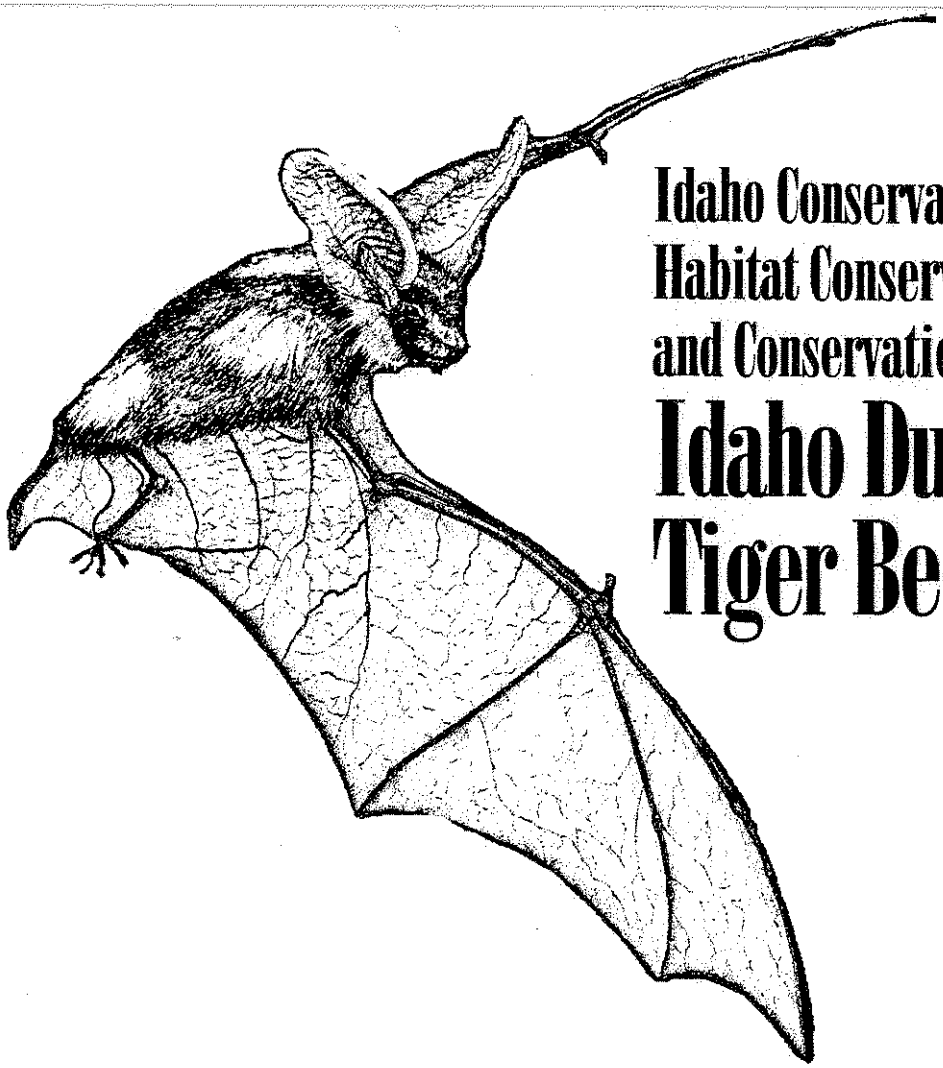
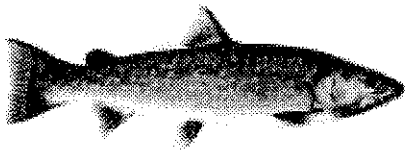
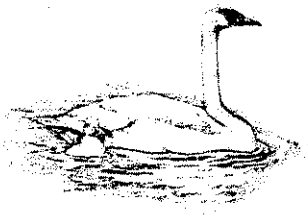


Idaho Conservation Effort, Habitat Conservation Assessment and Conservation Strategy for the

Idaho Dunes Tiger Beetle





REPORTS OF THE IDAHO STATE CONSERVATION EFFORT · REPORT 7 · MARCH 1996

An interagency conservation program (Idaho State Conservation Effort) was initiated in Idaho in late 1993 to remove threats and develop Conservation Agreements for species at risk of being listed as threatened or endangered. An emphasis on early conservation efforts for species at risk allows opportunities for State and Federal agencies and other interested parties to stabilize and recover these species and their ecosystems before listing becomes a high priority. Addressing the conservation needs of at risk species maintains management flexibility, reduces potential conflict and restrictive land use policies, avoids the confrontational atmosphere often associated with listing, and provides and ecologically sound and cost-effective means to conserve species. The primary agencies involved are the U.S. Fish and Wildlife Service, Bureau of Land Management, Regions 1 and 4 of the U.S. Forest Service, Idaho Department of Fish and Game, and Idaho Department of Parks and Recreation.

The Habitat Conservation Assessment summarizes distribution and abundance of the Idaho Dunes Tiger Beetle throughout its range and identifies threats to the species' existence. The Conservation Strategy prescribes conservation actions to remove threats to the species. The team leader and compiler of this document is Paul Makela, Bureau of Land Management, 15 East 200 South, Burley, ID 83318.

Further information on this report or the overall program can be obtained from: Charles E. Harris, Idaho Department of Fish and Game, P.O. Box 25, Boise, ID 83707.

This report should be cited as:

Idaho State Conservation Effort. 1996. Habitat conservation assessment and conservation strategy for the Idaho Dunes Tiger Beetle. Report No. 7. Boise, ID.

Spotted bat and trumpeter swan illustrations courtesy of Erica Craig.

HABITAT CONSERVATION ASSESSMENT AND STRATEGY

for the

Idaho Dunes Tiger Beetle

Cicindela arenicola Rumpp

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HABITAT CONSERVATION ASSESSMENT AND STRATEGY

February 23, 1996

Idaho Dunes Tiger Beetle
Cicindela arenicola Rumpp

INTRODUCTION

Since the 1980's, the Idaho dunes tiger beetle (Federal Category C2) has been under consideration to be listed by the U.S. Fish and Wildlife Service (Service) as a threatened or endangered species. Due to recently proposed changes in priorities and listing protocol within the Service, the C2 designation for candidate species may be eliminated in the near future. However, the dune tiger beetle's designation as an Idaho BLM Sensitive Species will remain in effect indefinitely, providing policy guidance for implementation of this Conservation Strategy on Idaho public lands.

This tiger beetle species is strictly limited to sand dune habitats in Idaho. Many of these dunes are small, scattered or isolated, particularly in Southcentral and Western Idaho, suggesting that the dunes tiger beetle may be more vulnerable to extirpation or habitat disturbances in the long term than are other tiger beetle species.

Currently, there is uncertainty regarding the taxonomy of the Idaho dunes tiger beetle. It is possible though unverified that beetles representing the Bruneau and St. Anthony populations may be separate species or subspecies. It is also possible that the two are distinct biotypes.

This Habitat Conservation Assessment and Strategy has been initiated to reduce threats to the Idaho dunes tiger beetle and to ensure management of sand dune habitats in a manner that provides for the species' life history requirements. The document's primary purpose is to conserve this species and its habitat through the implementation of conservation measures.

SPECIES INVOLVED

Idaho Dunes Tiger Beetle *Cicindela arenicola* Rumpp

- Northeastern Idaho Populations
- Western Idaho Populations
- Southcentral Idaho Populations

INVOLVED PARTIES

Bureau of Land Management, Idaho State Office

U.S. Fish and Wildlife Service

Bureau of Reclamation

Idaho Dept. of Parks and Recreation

Idaho Department of Fish and Game

STATUS, ECOLOGY AND DISTRIBUTION OF THE SPECIES

STATUS

The Idaho dunes tiger beetle was first collected in 1963 at St. Anthony Dunes, Fremont County and at Sand Lake, Owyhee County. The beetle was formally described as a distinct species in 1967 (Rumpp 1967). Subsequent surveys in the 1960's documented the species on the Bruneau Dunes, Owyhee County, and the Heyburn Dunes, Minidoka County. Recent surveys have documented the species occurrence in other localities in Owyhee, Minidoka, Power, Bonneville, Jefferson, Clark, Blaine and Lincoln Counties, Idaho (Anderson 1988, 1989; Baker et al. 1994; Bauer 1989; Makela 1994; Logan 1995). Thus *C. arenicola* is more widely distributed than was once hypothesized. Data on range-wide population trends are lacking.

Dune tiger beetle surveys have also been conducted in suitable habitats in Montana, Nevada, Oregon, Wyoming, and Utah, but *C. arenicola* has not been documented (Anderson 1989). The Great Sand Dunes tiger beetle (*C. theatina*), a species similar to the Idaho dunes tiger beetle, occurs at Great Sand Dunes National Monument near Alamosa, Colorado (Roberta Williams, Southwest Parks and Monuments Area Manager, personal communication, August 23, 1994). This species has also been documented in Wyoming and Utah (Anderson 1989).

There is some degree of uncertainty regarding the taxonomy of *C. arenicola*; it is possible that the Bruneau Dunes and St. Anthony populations comprise distinct species (Dr. S. Leffler, personal communication, May 3, 1995). It has also been suggested by Mr. Vernon Clifford that the Bruneau Dunes population is a distinct subspecies (see Shook and Clark 1988). However, Dr. Robert C. Anderson, Idaho State University, suggests that it is possible, if not likely, that specimens of beetles in populations between the St. Anthony Dunes in Northeastern Idaho, and the Bruneau Dunes in Western Idaho, show a mix or variations of the trait or traits which are

supposedly unique to the Bruneau population. Anderson suggests that three general biotypes exist: a green/metallic green variant to the west at Bruneau Dunes; a coppery variant to the east at St. Anthony Dunes; and a coppery mixed with green variant in intermediate locations in Power, Bannock, and Bonneville Counties (Anderson 1989).

For the purposes of this Conservation Assessment and Strategy, Idaho dunes tiger beetle populations in Northeastern, Western and Southcentral Idaho will be treated as a single taxonomic entity, due to similarities in the beetles' habitats, ecology, behavior, reproduction, and feeding habits, and because of the apparent uncertainty regarding the species' taxonomy. Populations in Northeastern, Western and Southcentral Idaho will nonetheless be addressed separately due to differing degrees or types of threats and/or apparent relative abundances. Also, it is the opinion of the Conservation Assessment and Strategy Team that addressing threats and conservation actions geographically will make for a more efficient and readily useable document for agency field and management personnel.

ECOLOGY

Both the larvae and adults of the dunes tiger beetle are obligate predators and feed on insects and other arthropods. Larvae live in stationary burrows located where eggs were laid by adults. Such burrows generally are found in the flat, grassy areas on the windward side of dunes and where the sand is at least three feet thick. Mortality of first instar larvae is very high because few obtain prey during the first five to seven days after hatching, and their burrows are very shallow (0.25-1.0 inch deep), rendering them vulnerable to disturbance. Later instars experience less mortality because their burrows are much deeper, reaching up to 18-24 inches in depth. Larvae which are richly fed may complete development and pupate after two years, but others may require up to four years to complete metamorphosis. Dunes tiger beetles over-winter as pupae or as adults beneath the surface of the sand. Adults generally emerge from mid-March through April and May, although adult beetles have been observed as early as February in Western Idaho (Dr. C. Baker, Boise State Univ., pers. comm. 1995) and Southcentral Idaho (P. Makela, unpublished data, 1995). Adults may then disperse from their points of emergence up to one-half mile in six weeks, although most remain in the local area of the dune on which they developed. Adult beetles eat, mate, and the females subsequently lay eggs singly and in random fashion during late April and early May. These eggs hatch in a week or two, often in synchrony. Adult beetles burrow into the sand every evening at sunset and emerge the following morning when the sun warms the soil surface. Adult beetles die during June and few remain at mid-summer (Dr. R.C. Anderson, Idaho State University, personal communication July 14, 1994).

DISTRIBUTION

Northeastern Idaho Populations. Fremont, Jefferson, Madison, Clark, Bonneville Counties, including St. Anthony Dunes. See Attachments 1a-1f for Distribution Maps.

The report titled The Dunes Tiger Beetle, Final Report for BLM Contract ID-030-CT8-005, (Anderson 1989); and Idaho BLM Technical Bulletin 95-17 Idaho dune tiger beetle survey 1995 (Logan 1995), will serve as primary references for this geographic area, as they contain the most current available information concerning dune tiger beetle ecology, distribution and/or threats relevant to Northeastern Idaho.

Dune tiger beetles have been documented in portions of Fremont, Jefferson, and Clark Counties. The species was documented on the Idaho Department of Fish and Game's Sand Creek Wildlife Management Area in 1995 (Logan 1995). The St. Anthony Dunes complex represents the largest contiguous area of sand dune activity in Idaho. Careful management of this dune complex is integral to any conservation strategy concerning dune tiger beetles. Administration of the St. Anthony Dunes area is predominantly under the jurisdiction of the BLM's Medicine Lodge Resource Area. Occurrences of Idaho dunes tiger beetles in the St. Anthony Dunes area have been documented in comparatively high densities up to 3049 beetles/ha of suitable habitat (based on a high of 8-10 beetles per/353 sq ft reported by Anderson 1989).

Western Idaho Populations. Owyhee County, including Bruneau Dunes State Park. See Attachment 2 for Distribution Map.

The Idaho BLM Technical Bulletin 94-1 Bruneau Dunes Tiger Beetle Inventory, (Baker et al. 1994) will serve as the primary reference for this geographic area, as it contains the most current, available information concerning dune tiger beetle ecology, distribution and threats relevant to Western Idaho.

Occurrences of the Idaho dunes tiger beetle in Western Idaho are limited to a few locations within and bordering Bruneau Dunes State Park and one location approximately 8 miles (13 km) to the east. Dune sites outside the park are under management jurisdiction of the BLM's Jarbidge Resource Area. Recent studies suggest an adult beetle density of only 2.7/hectare at Bruneau Dunes, compared with 762 to 1677/ha in certain parts of Power County in eastern Idaho (Dr. C. Baker, Boise State University, personal communication, June 6, 1994 and calculations derived from Anderson 1989). Beetle populations at Bruneau Dunes State Park appear to be of very low density. Their very limited distribution and low numbers may render these populations at greater risk of extinction than populations in eastern Idaho. Populations appear to be viable at this time, however (J. Klott, Wildlife Biologist, BLM, Jarbidge Resource Area, personal communication, July 14, 1994).

Southcentral Idaho Populations. Bannock, Power, Blaine, Minidoka, and Lincoln Counties. See Attachments 3a-3g for Distribution Maps.

The M.S. thesis titled Observations on the developmental biology of *Cicindela arenicola* Rumpp (Bauer 1989); Idaho BLM Technical Bulletin 94-2 Burley District tiger beetle inventory (Makela 1994); and Idaho BLM Technical Bulletin 95-17 Idaho dune tiger beetle survey 1995 (Logan 1995) will serve as primary references for this geographic area. These documents contain the most current, available information concerning dune tiger beetle ecology, distribution and/or threats relevant to Southcentral Idaho.

Much of the known tiger beetle habitat in Southcentral Idaho is under management jurisdiction of the BLM's Snake River Resource Area. Dunes tiger beetles also occur on a few small dunes within the BLM's Shoshone Resource Area between Dietrich and Kimama, Idaho (Logan 1995; D. Fielding, unpublished data, 1995; P. Makela, unpublished data, 1995). Tiger beetles are also known to inhabit or potentially inhabit scattered dunes north of the Snake River on certain Bureau of Reclamation, Minidoka National Wildlife Refuge, State and private lands (Makela 1994; Logan 1995).

Anderson (1989) estimated adult dune tiger beetle densities in suitable habitats ranging from a low of 762 beetles/ha (based on observations of 2.5 per 353 square ft) to 1677/ha (based on observations of 5.5 beetles per 353 sq ft) in portions of Power County. Tiger beetles were known historically on the Heyburn Dunes near Burley but this population is now currently thought to be extinct due to intensive human activity (Anderson 1989). While dunes and dune complexes in Blaine, Lincoln, Minidoka, and Power Counties are generally widely scattered and small, one large dune complex (an area of dune activity within a matrix of rangeland vegetation) of approximately 25 to 30 square miles in size occurs in the latter County (Anderson 1989; Makela 1994). While dunes tiger beetles can be found on many, if not most dunes in the area, the small size and isolated nature of many of the dunes renders them vulnerable to disturbance and incremental loss over time. The more isolated, smaller dunes may support beetle populations of relatively low numbers. Protection of these small isolated as well as larger dune complexes may be integral to the long-term preservation of the species.

THREATS TO THE SPECIES

Present or threatened destruction, modification, or curtailment of the species habitat or range.

Off-Road Vehicle (ORV) Activity. Area(s) affected: Northeastern, Western, Southcentral Idaho.

A 1989 study conducted on the BLM's Idaho Falls District in cooperation with Idaho State University suggested that there was no significant difference in larval burrow density between active ORV test plots and control plots (Anderson 1989). However, this conclusion was based on treatments of one, three and six passes by an All-Terrain Vehicle and may not reflect impacts due to more intensive, sustained use; dramatic increases in ATV use; or the use of different types of ATV's such as motorcycles, dune rails and four-wheelers. In fact, Anderson (1989) indicated that smaller, first instar larvae, with burrows 0.25-1.0 inch deep are "unlikely to survive any physical disturbance at the dune surface". Anderson (1989) also suggested that "surface perturbations of the type which might result from widespread ORV use could qualitatively or quantitatively influence available prey, and in this way indirectly affect the number of older larvae which pupate and reach adulthood". As ORV activity has increased dramatically in the St. Anthony Dunes area of Northeastern Idaho in recent years, it is crucial that such use be managed more intensively to ensure that resource values are not irretrievably lost.

ORV's pose a potentially significant threat to sand dune ecology in certain portions of Owyhee County in Western Idaho. Some small, more accessible dunes are currently being impacted by repeat, unauthorized ORV activity. Young, "first instar" larval burrows are likely destroyed by such disturbance, although adults likely escape harm. Depending on dune size, ORV traffic could drive a localized beetle population to extinction, especially since first instar larvae inherently have a high mortality rate, and since the acreages of available larval habitats involved are relatively small.

Impacts from ORVs also pose a potentially significant threat over the long term to small sand dunes in portions of Southcentral Idaho. ORVs have historically impacted certain Bureau of Reclamation and BLM lands along the Snake River, but recently imposed ORV closures designed to protect cultural resources have resolved this issue. Remote, less accessible, small dunes on BLM lands outside the closure area are rarely impacted at this time. However, certain other small, more accessible dunes on BLM and/or state lands in Minidoka, Power, and Blaine Counties (and outside the closure area) are currently being impacted by light to heavy ORV or four-wheel drive activity, at least periodically. Overall, impacts of ORVs on tiger beetle habitat in Southcentral Idaho are probably not currently significant, although certain areas bear monitoring and closer management. For example, there is currently great interest among the ORV clientele in the sandy corridor paralleling the north edge of the Snake

River between Lake Channel and American Falls. This area receives moderate to seasonally high and relatively uncontrolled ORV/motorcycle use already.

Dune stabilization with grass seedings. Area(s) affected: Primarily Southcentral Idaho.

Only areas with freely moving, sparsely vegetated sand have been found to support dune tiger beetles; thus any action that significantly changes the character of active dunes will likely have an adverse impact. Dune stabilization projects involving the artificial seeding of exotic or native plant species onto sand dunes yields a vegetative cover and density not compatible with tiger beetle ecology. Resulting increases in plant cover provide increased hiding opportunities for leopard lizards and other beetle predators, and may physically interfere with maintenance of burrows by larvae (Baker et al. 1994). Unnatural shading of dunes by seeded species may also adversely impact larval success (Baker et al. 1994).

Dunes naturally vegetated with species such as yellow wildrye (*Elymus flavescens*), and scurfpea (*Psoralea lanceolata*), appear to remain in a state of "dynamic equilibrium" in that the vegetative cover and density seem to remain low enough to sustain open, active sand movement. This apparently is not the case with artificially seeded dunes featuring crested wheatgrass. Large-scale seedings for purposes of livestock forage, dune stabilization and/or wildfire rehabilitation have been accomplished in past decades on the BLM's Burley and Shoshone Districts. Some of these seedings encompassed dune habitats, rendering them unsuitable for tiger beetles.

While the threat of additional large-scale seeding conversions of beetle habitat may no longer exist under new paradigms of ecosystem management and range reform, there may be concerns with existing seedings. Casual observations of exclosures in dune habitats within crested wheatgrass seedings suggest that, in the absence of livestock impacts, established crested wheatgrass may gradually invade and eventually stabilize small dunes to the detriment of tiger beetles (Makela, personal observation 1995). Thus, in areas characterized by small dunes within or adjacent to crested wheatgrass seedings, livestock grazing may be an important influence in keeping dunes relatively open and unstable, and suitable for tiger beetles; despite the fact that cattle may trample some larval burrows. This observation is consistent with Bauer (1989) and may be worthy of additional research. Long-term monitoring of vegetation trends on native, seeded, grazed and ungrazed dunes is warranted.

Trampling of larval burrows by livestock. Area(s) affected: Northeastern, Western, Southcentral Idaho.

In general, trampling of larval habitats by livestock has not yet been identified as a significant cause for concern. However, current knowledge regarding the effects of cattle activity on tiger beetle habitat is ambiguous. Certainly, livestock can crush younger, shallower larval burrows or collapse deeper burrow tubes through trampling; yet trampling and grazing disturbances may also aid in keeping dunes active, by reducing encroaching vegetation (Bauer 1989), especially in areas dominated by aggressive, exotic grasses. In areas where warranted, such as in pastures supporting key larval habitat, it may be possible to minimize trampling effects of livestock through modifications in season of use or grazing systems although additional research may be warranted to ascertain the degree of threat, if any.

Livestock trampling is currently not a threat within Bruneau Dunes State Park but is potentially an issue on BLM lands outside the park.

In Southcentral Idaho, trampling of larval habitat by livestock occurs to some extent, but may not be significant on a large scale. Dune tiger beetles have persisted for decades and possibly for over a century in the presence of livestock in Southcentral Idaho. Currently, dune tiger beetles are routinely found on dunes within several grazing allotments north of the Snake River. Certain dunes have been found to receive heavy disturbance from livestock yet at least appear to harbor relatively robust populations (P. Makela, unpublished data). See also the related discussion above regarding dune stabilization.

Land disposal. Area(s) affected: Northeastern, Western, Southcentral Idaho.

Disposal of public (BLM, BOR) and State lands by transfer to private ownership via trade or sale could result in a net loss of dunes tiger beetle habitat. Such lands would likely be seeded to rangeland grasses or cultivated once under private ownership. With respect to BLM lands, it is Bureau policy (6840.06C), however, to " ...ensure that actions authorized, funded, or carried out do not contribute to the need to list any of these (candidate) species as Threatened or Endangered." Disposal of public lands characterized by existing or potential beetle habitat would not be consistent with this guidance.

Disposal of public lands is not currently an issue germane to tiger beetle habitat in Northeastern or Western Idaho but is a potential threat should certain public or state lands be targeted for disposal in the future.

In the BLM's Snake River Resource Area in Southcentral Idaho, several parcels of public land characterized by Idaho dunes tiger beetle habitat have been previously

identified for disposal under the Monument Resource Management Plan. While management for tiger beetle habitat was not an issue at the time this RMP was prepared, current concerns would preclude disposal. Opportunities may exist in the near future for the acquisition of certain private, state, or Bureau of Reclamation lands through mutually beneficial land exchanges.

Conversion of dune habitats to agriculture. Area(s) affected: Primarily Southcentral Idaho.

While not currently a critical issue in Northeastern or Western Idaho, the potential exists for conversion of dune habitats on non-public lands outside the St. Anthony complex for agricultural or other uses.

Examination of aerial photography indicates that a portion of historic sand dune habitats in the American Falls area in Southcentral Idaho have been converted to agriculture. Such land conversions on private acreages, while outside the scope of this conservation strategy, convey an even greater importance to tiger beetle habitat currently associated with nearby public lands. Future agricultural conversion of existing dune habitats on private lands near American Falls will gradually result in further fragmentation and a net loss of tiger beetle habitat, since a substantial proportion of known tiger beetle habitat in Southcentral Idaho occurs in this area (see the large dune complex delineated on Attachments 3b and 3c). Dune tiger beetles also presently occur in relatively robust numbers on several hundred acres of state land southwest of American Falls. Since management objectives for state and private lands are often commodity-driven, prospects for long-term maintenance of active sand dune habitats in such areas are questionable.

Excessive human foot traffic. Area(s) affected: Western Idaho.

Heavy use of areas where beetle larvae occur can lead to the loss of significant numbers of beetles. Recurring trampling of burrows could cause the death of the larvae due to repeated destruction of the burrow openings. Each time a burrow is trampled, a larvae must re-excavate the burrow and reform the surface collar, depleting nutritional stores that could otherwise be directed toward growth and maturation (C. Baker, Boise State University, personal communication, May 13, 1994).

Overutilization for commercial, recreational, scientific, or educational purposes.

Unregulated collecting of adult dunes tiger beetles. Area(s) affected: Western Idaho.

While population effects are not known at this time, it is known that the Bruneau Dunes State Park area has been, in the decades through the 1970's, a popular collection site for commercial tiger beetle collectors (Shook and Clark 1988). It has been speculated that this unregulated collection of adult tiger beetles has adversely affected beetle numbers in the Bruneau Dunes area, and perhaps in other low density habitats. Due to recent implementation of a more stringent policy regarding beetle collecting, this activity is probably no longer a problem at the park.

Disease or predation.
Not identified as an issue at this time.

Other natural or manmade factors affecting the species continued existence.

Insecticides. Area(s) affected: Northeastern, Western, Southcentral Idaho.

Protection of private lands from grasshoppers and Mormon crickets via the use of pesticides on adjacent public lands poses a potential threat to nearby populations of the dunes tiger beetle and/or beetle prey. Careless or wide-scale use of insecticides such as Malathion or poisoned baits could cause direct or secondary poisoning of individual beetles and subsequent extirpation of local populations if beetles are inadvertently sprayed or target insects are consumed by the predatory beetles.

Invasion of habitat by native and exotic weeds. Area(s) affected: Western, Southcentral Idaho.

Dunes tiger beetles require active barren or sparsely vegetated sand dune habitats. Invasion of dunes by weedy plants such as cheatgrass (*Bromus tectorum*) Russian thistle (*Salsola kali*) and ambrosia (*Ambrosia acanthicarpa*), renders dunes unsuitable for the species (Baker et al. 1994). The presence of encroaching vegetation may interfere with the larvae's maintenance of burrows, and could render them more vulnerable to parasites and parasitoids. Vegetation also provides hiding cover for lizards and other predators which prey on adult beetles and may also hinder larval success through shading. Encroachment of dunes by such weeds has been documented at Bruneau Dunes State Park (Baker et al. 1994).

In Southcentral Idaho, certain dunes on public land in Power County, immediately west of Gifford Spring, have been recently documented as having substantial, localized encroachment by Russian thistle (P. Makela, 1994, unpublished data). Cheatgrass has also been observed on certain dunes on BLM's Snake River and Shoshone Resource Areas and on Minidoka National Wildlife Refuge lands. Overall, invasions by weedy species probably do not currently pose a significant threat on most dunes in Southcentral Idaho, however such invasions may be locally or temporally significant especially during years of high precipitation.

Inadequacy of existing regulatory mechanisms.

This issue has not been identified as pertinent to Western or Southcentral Idaho. However, the potential cumulative impacts of an ever-increasing ORV and Recreation clientele, and the uncertainty of the effects of livestock on dune systems and on tiger beetle ecology are of substantial concern in Northeastern Idaho. The Medicine Lodge Resource Area's existing management plan for the St. Anthony Dunes complex is currently inadequate to provide for the long-term viability of this important dune system.

CONSERVATION STRATEGY

NORTHEASTERN IDAHO POPULATIONS

Existing Actions

1. At the St. Anthony Dunes, BLM will continue to maintain and promote the directional open sand route between Egin Lakes and the Sand Hills Resort, to more closely manage impacts to the St. Anthony Dunes.

2. At St. Anthony Dunes, continue implementation of the Visitor Information and Education program. With the help of seasonal technicians, visitors are being educated regarding dune ecology, sensitive wildlife and plants, and ways ORV users and others can minimize adverse impacts.

3. Retain existing tiger beetle habitat on BLM lands in federal ownership. Continue pursuing the acquisition and protection of tiger beetle habitat through land exchanges agreeable to involved parties.

Actions That Will Be Implemented

1. Initiate the Sands Habitat Management Plan/ Coordinated Resource Management Plan Revision and EIS by October 1, 1997. This comprehensive land use activity plan, which includes the St. Anthony Sand Dunes area, will include conservation actions to ensure the integrity of Idaho Dunes tiger beetle habitat. The conservation actions in the CRMP will depend on an evaluation of the following interim actions:

   a. Effectiveness of the ORV directional open sand route between Egin Lakes and the Sand Hills Resort in conserving Idaho dunes tiger beetle habitat and populations.

   b. Continue to document the presence/absence and/or relative abundance of adult tiger beetles and larval burrows especially in previously unsurveyed, outlying areas. Monitoring efforts are dependent upon funding and existing personnel constraints.

   c. On BLM lands, document threats to dune systems. Such documentation may include mapping locations of intensive ORV activity, cattle or big game concentrations, etc.

2. On BLM lands, application of insecticides will not be allowed within known or potential Idaho dunes tiger beetle habitat. A buffer zone of 0.5 miles around such habitat will also be established in which no aerial application of insecticides will be allowed. Use of biological control agents will be considered within the buffer zones, however. Poisoned baits may be ground-applied within 100 yards of sand dunes and dune complexes. These stipulations will be incorporated into the District's Annual Grasshopper Control Environmental Assessment Review Document.

3. On the Idaho Department of Fish and Game's Sand Creek Wildlife Management Area, ensure that sand dunes are maintained in a natural, active state.

WESTERN IDAHO POPULATIONS

Existing Actions

1. On BLM lands, application of insecticides is not allowed within designated Idaho dunes tiger beetle habitat. A buffer zone of 0.5 miles has also been established in which no aerial application of insecticides is allowed. Biological control agents are authorized within the buffer zones, however. Poisoned baits may be ground-applied within 100 yards of sand dunes and dune complexes. These stipulations will be incorporated into the District's Annual Grasshopper Control Environmental Assessment Review Document.

2. In Bruneau Dunes State Park, a "no insecticide spray" policy is in effect and will be continued.

3. In Bruneau Dunes State Park, collection of Idaho dune tiger beetles is not authorized. This policy will remain in effect.

4. In Bruneau Dunes State Park, a fence has been constructed to exclude cattle and unauthorized ORVs from the primary beetle habitat area. This fence will be maintained by park personnel. The fenced area will protect beetle habitat from livestock and ORVs and could also serve as an ungrazed control in the event that a research study on livestock-dune tiger beetle relationships is implemented.

5. Within Bruneau Dunes State Park, continue to exclude ORVs to protect the integrity of dune systems.

6. Continue cooperative research on the effects of weed invasions on larval habitat and larvae survival with a goal of determining suitable weed control methods.

7. Continue cooperatively funded inventories and monitoring of dune tiger beetle habitats.

Actions That Will Be Implemented

1. Manage ORV use on BLM lands in the Lower Snake River District so as to minimize impacts to dune ecology through the use of local restrictions, fencing, and/or signing as needed.

2. On BLM and Bruneau Dunes State Park Lands, regulate horse and human foot-traffic on sand dunes and larval habitats during key periods if dunes tiger beetle population declines occur that can be correlated with such impacts; or in the event of unquantified, though visually obvious impacts, such as excessive trampling in larval habitat.

3. On BLM and State Park lands, document threats to dune systems. Such documentation may include mapping locations of ORV activity, weed invasions, concentrations of foot-traffic, etc.

SOUTHCENTRAL IDAHO POPULATIONS

Existing Actions

1. On Snake River Resource Area BLM lands, continue the suspension of further sand dune stabilization projects, and livestock forage seedings in dune habitats except on a very small scale where absolutely needed to protect existing range developments or roads. Other new projects affecting sand dunes, such as fire rehabilitation seedings, pipelines, roads, fences, etc., will be mitigated on a case by case basis to ensure that existing and potential dune tiger beetle habitat is afforded adequate protection. The primary consideration will be to preserve the natural integrity and character of sand dune habitats to the greatest extent possible.

2. As time and other priorities permit, continue documenting and mapping dune tiger beetle observations, with a goal of refining knowledge of the species' status and distribution.

3. Existing vehicle closures on Bureau of Reclamation lands along the Snake River will continue indefinitely. These closures were implemented to protect cultural and archaeological values on lands near the Snake River, however they also effectively protect tiger beetle habitat within the closure areas.

Actions That Will Be Implemented

1. On Shoshone Resource Area (BLM), Bureau of Reclamation and Minidoka National Wildlife Refuge lands, implement a suspension on further sand dune stabilization projects (seedings, etc.) except on a very small scale where absolutely needed to protect existing range developments or roads. Other new projects affecting sand dunes, such as forage or fire rehabilitation seedings, pipelines, roads, fences, etc., will be mitigated on a case by case basis to ensure that existing and potential dune tiger beetle habitat is afforded adequate protection. The primary consideration will be to preserve the natural integrity and character of sand dune habitats to the greatest extent possible.

2. Ensure that BLM, BOR, and USFWS lands harboring sand dune habitats are retained in appropriate Federal ownership.

3. Consider acquiring, via land exchange, certain parcels of private and/or State lands characterized by sand dunes, especially in the area between American Falls and Lake Channel.

4. On BLM, BOR, and Minidoka National Wildlife Refuge Lands, document threats to dune systems as manpower, funding and priorities permit. This may include mapping locations of ORV activity, weed invasions, cattle concentrations, etc.

5. On BLM, BOR and Minidoka National Wildlife Refuge lands, application of insecticides will not be allowed within known or potential Idaho dunes tiger beetle habitat. A buffer zone of 0.5 miles around such habitat will be established in which no aerial application of insecticides will be allowed. Use of biological control agents will be considered within the buffer zones, however. Poisoned baits may be ground-applied within 100 yards of sand dunes and dune complexes. For BLM lands, these stipulations will be incorporated into the District's Annual Grasshopper Control Environmental Assessment Review Document.

6. Manage ORV use to minimize impacts to sand dune habitats via local restrictions, signing, education, designated routes, fencing or other measures deemed suitable. A goal will be to work with ORV users to achieve voluntary compliance. The primary area of focus will be dunes along the Snake River southwest of American Falls, on the BLM's Snake River Resource Area.

7. Establish one or more permanently located sites on dunes characterized by grazed and ungrazed treatments to determine trends in larval burrow densities, and cover and/or density of key grass species.

8. On the Shoshone Resource Area, examine potential tiger beetle habitats delineated but not surveyed by D. Logan (1995), to document presence or absence of dune tiger beetles.

RESEARCH NEEDS

1. Study the effects of repeated, high intensity, long-term all-terrain vehicle use on tiger beetle larval habitat and larvae survivorship. Such a study should also compare the relative effects of ATVs, motorcycles, rails etc. High priority.

2. Develop a taxonomic key for use by field personnel in the Identification of the various tiger beetle species in Idaho. Medium to high priority.

3. Study the effects of cattle trampling and grazing in larval burrow habitat, with a goal of identifying degree of threat and if possible, compatible grazing systems, intensities and/ or seasons of use. Medium priority.

4. Develop and verify a method for monitoring dune tiger beetle population trends. Medium priority.

5. Refine knowledge of soils and vegetation characteristics of dune tiger beetle larval habitat, to ascertain microhabitat preference and requirements. Medium to low priority.

6. Conduct a genetic study of dune tiger beetle populations in Northeastern, Western, and Southcentral Idaho and outlying populations to determine taxonomic status. Low priority.

ATTACHMENTS

1a-1f. Current and potential distribution of the Idaho dunes tiger beetle in Northeastern Idaho.

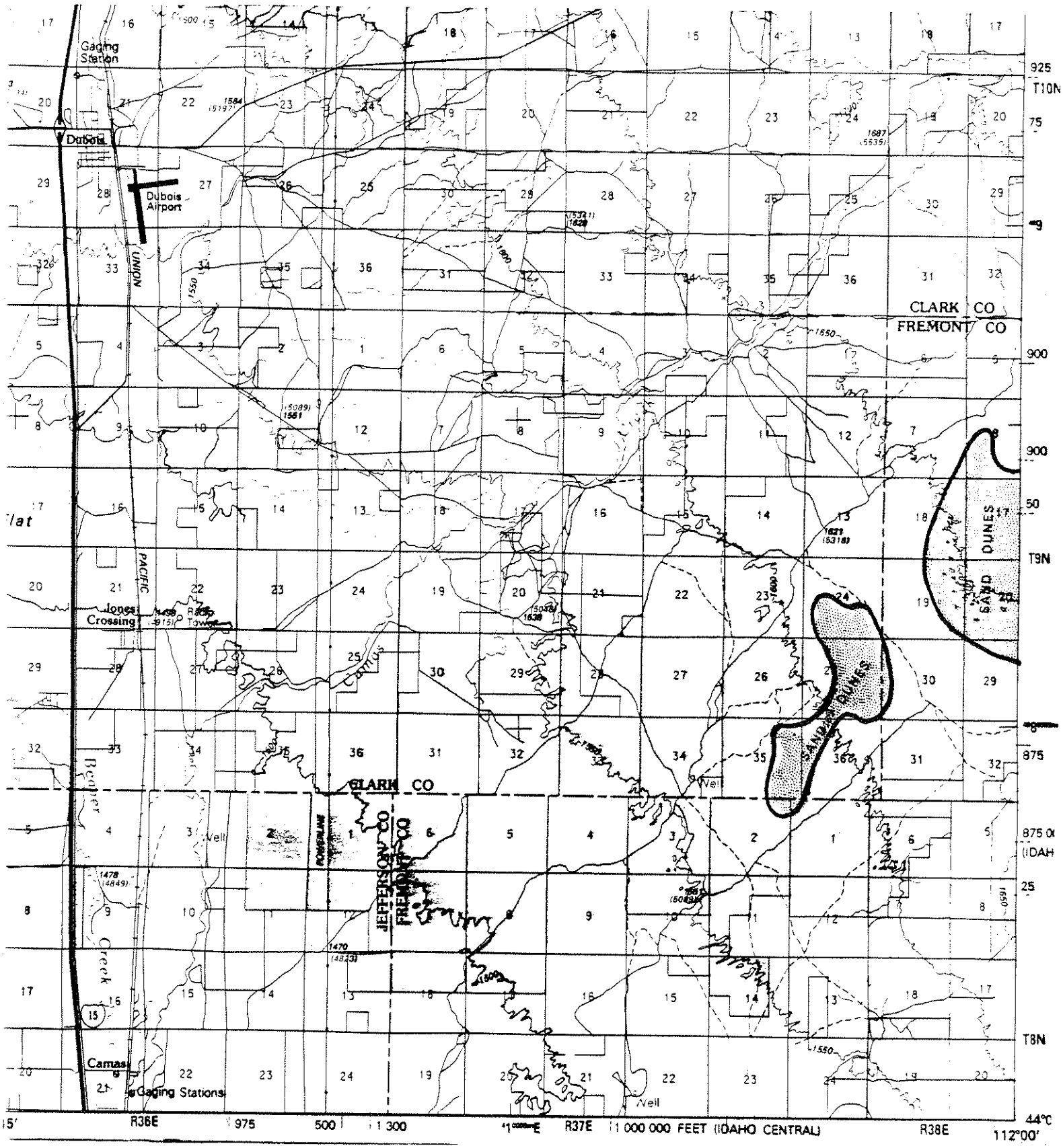
2. Current and potential distribution of the Idaho dunes tiger beetle in Western Idaho.

3a-3g. Current and potential distribution of the Idaho dunes tiger beetle in Southcentral Idaho.

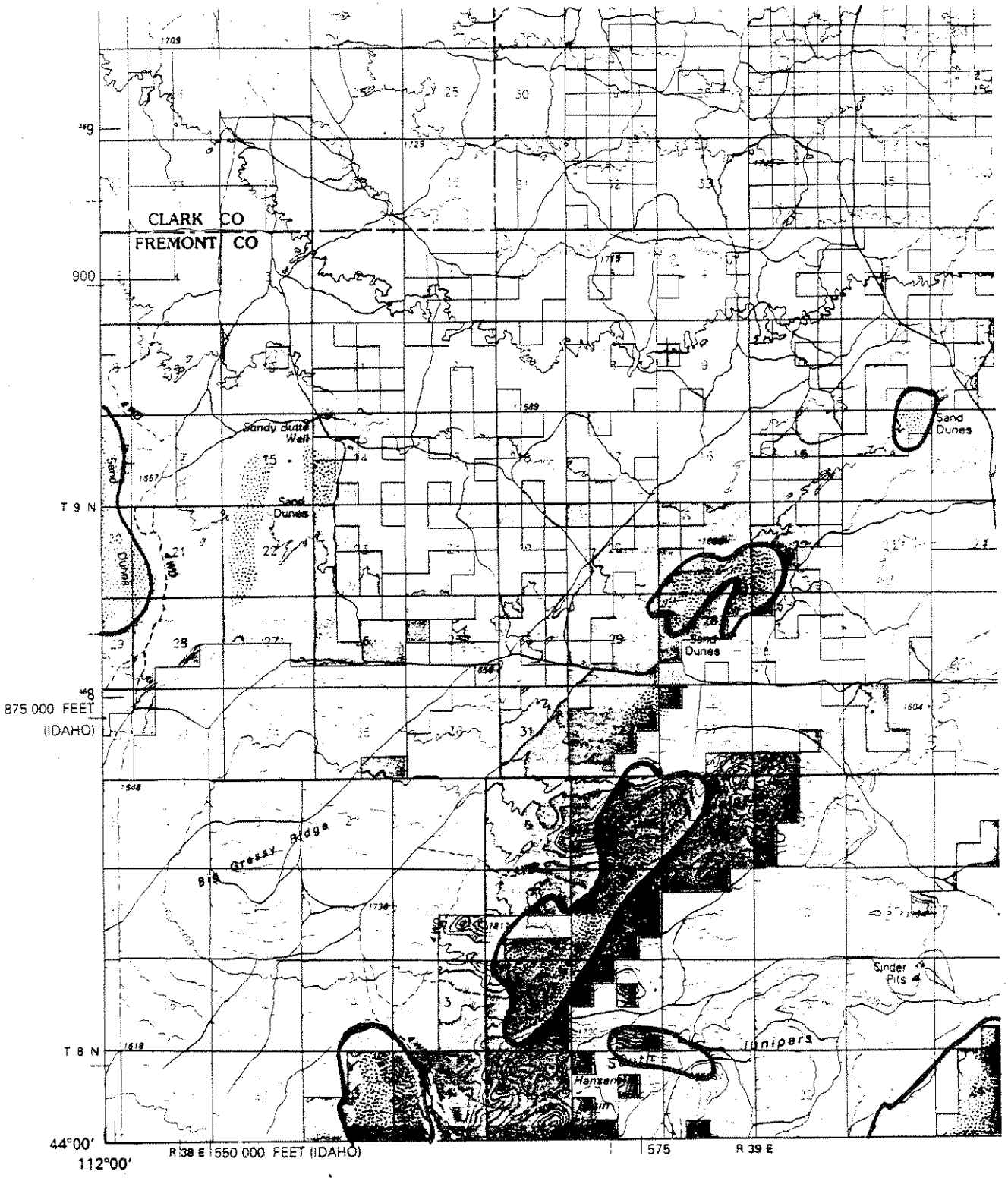
4. Conservation Assessment and Strategy Team Members and Technical Committee Representatives

5. Literature Cited

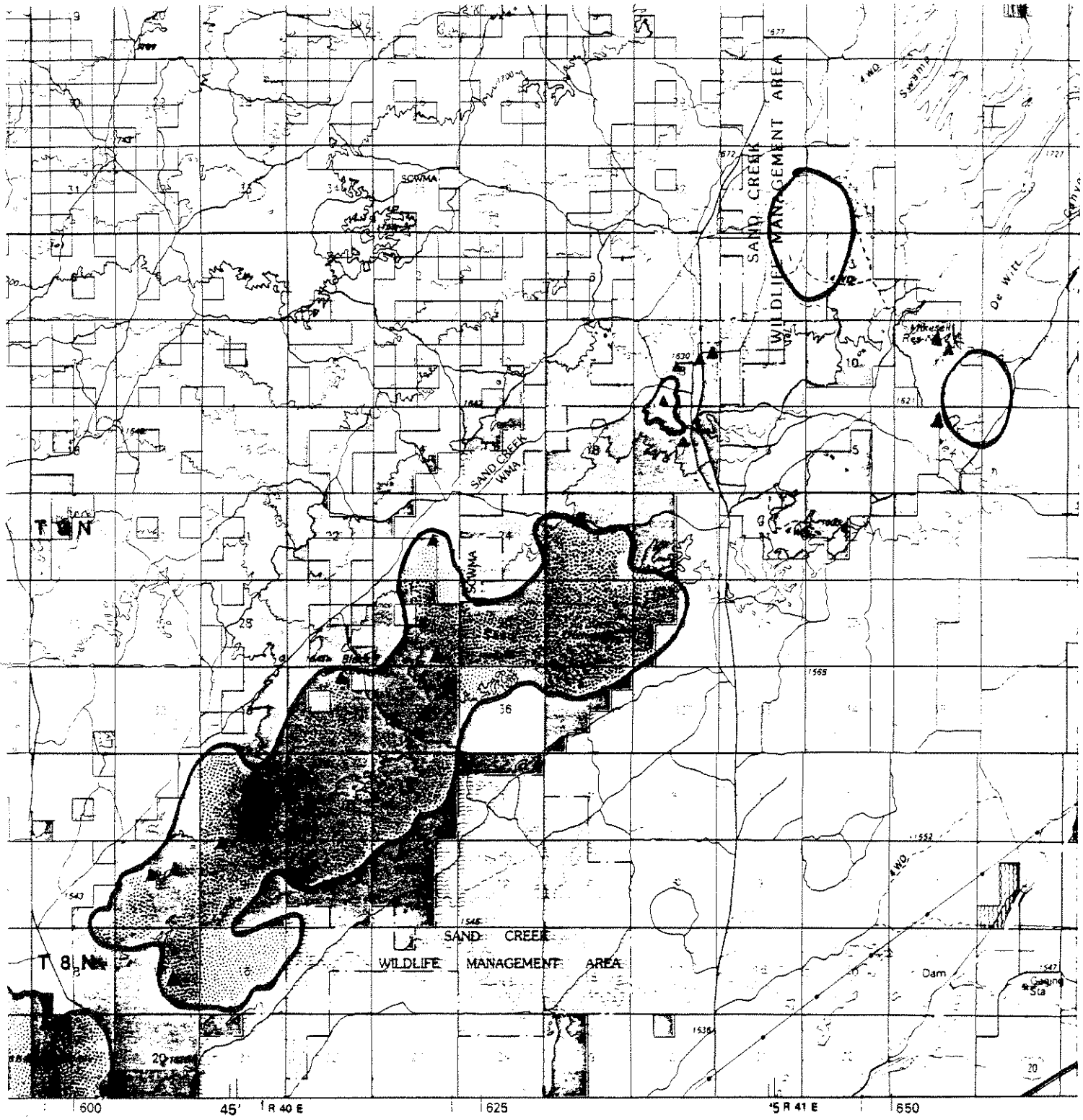
Attachment 1a. Current and potential distribution of the Idaho dunes tiger beetle in Northeastern Idaho. Dubois 1:100,000 surface management map.



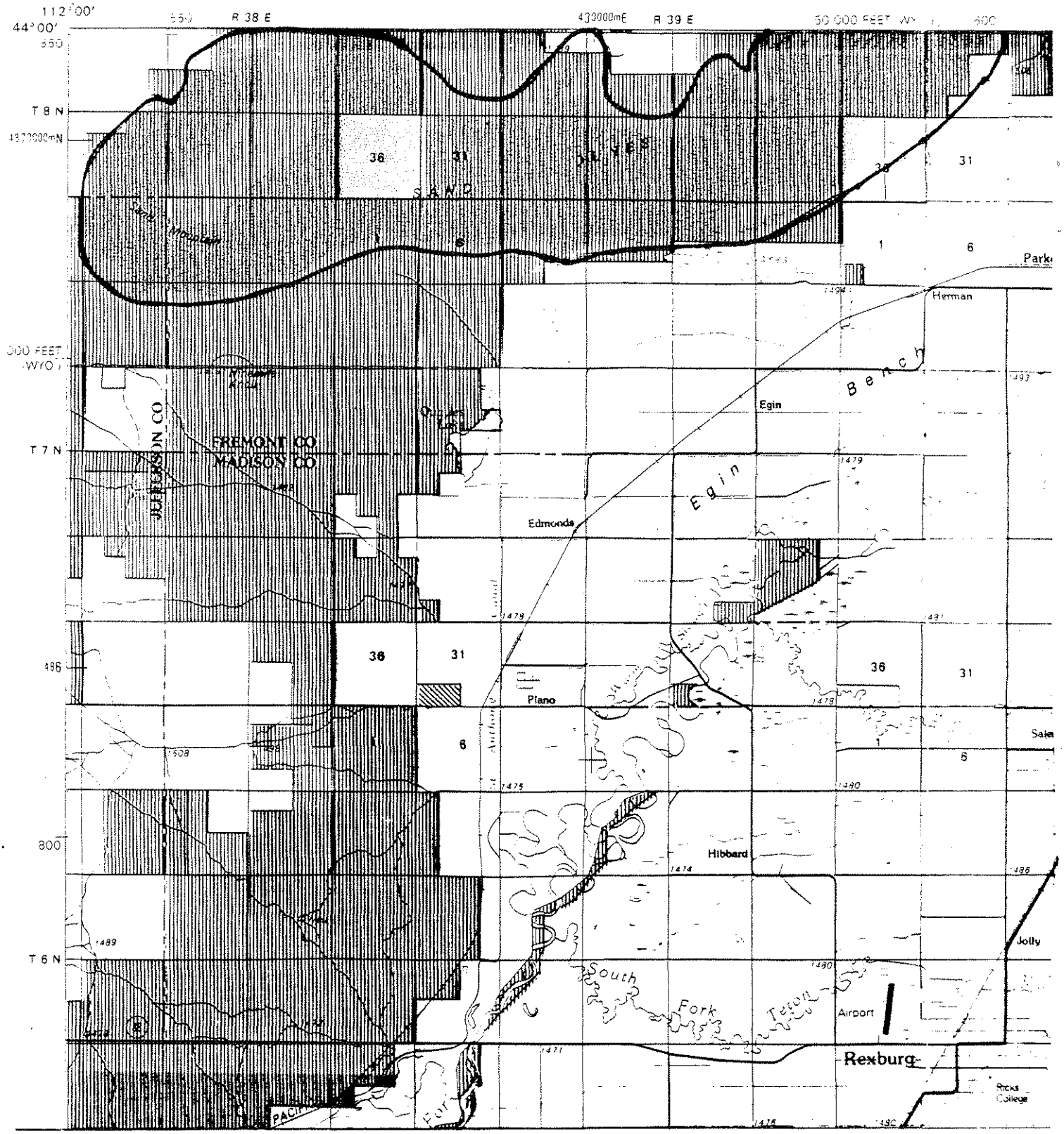
Attachment 1b. Current and potential distribution of the Idaho dunes tiger beetle in Northeastern Idaho. Ashton 1:100,000 surface management map.



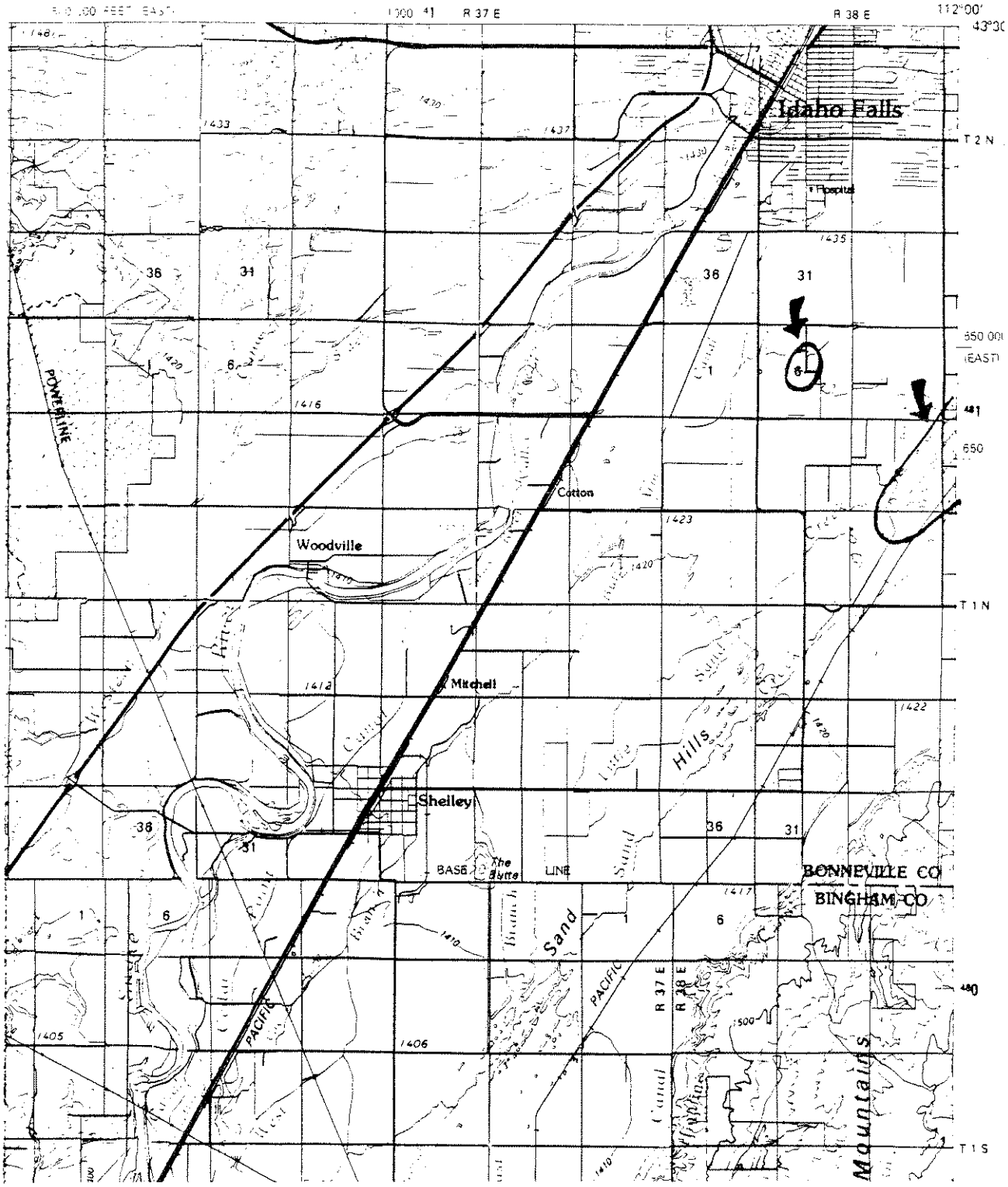
Attachment 1c. Current and potential distribution of the Idaho dunes tiger beetle in Northeastern Idaho. Presence of *C. arenicola* documented by D. Logan in 1995 are marked with a ▲. Ashton 1:100,000 surface management map.



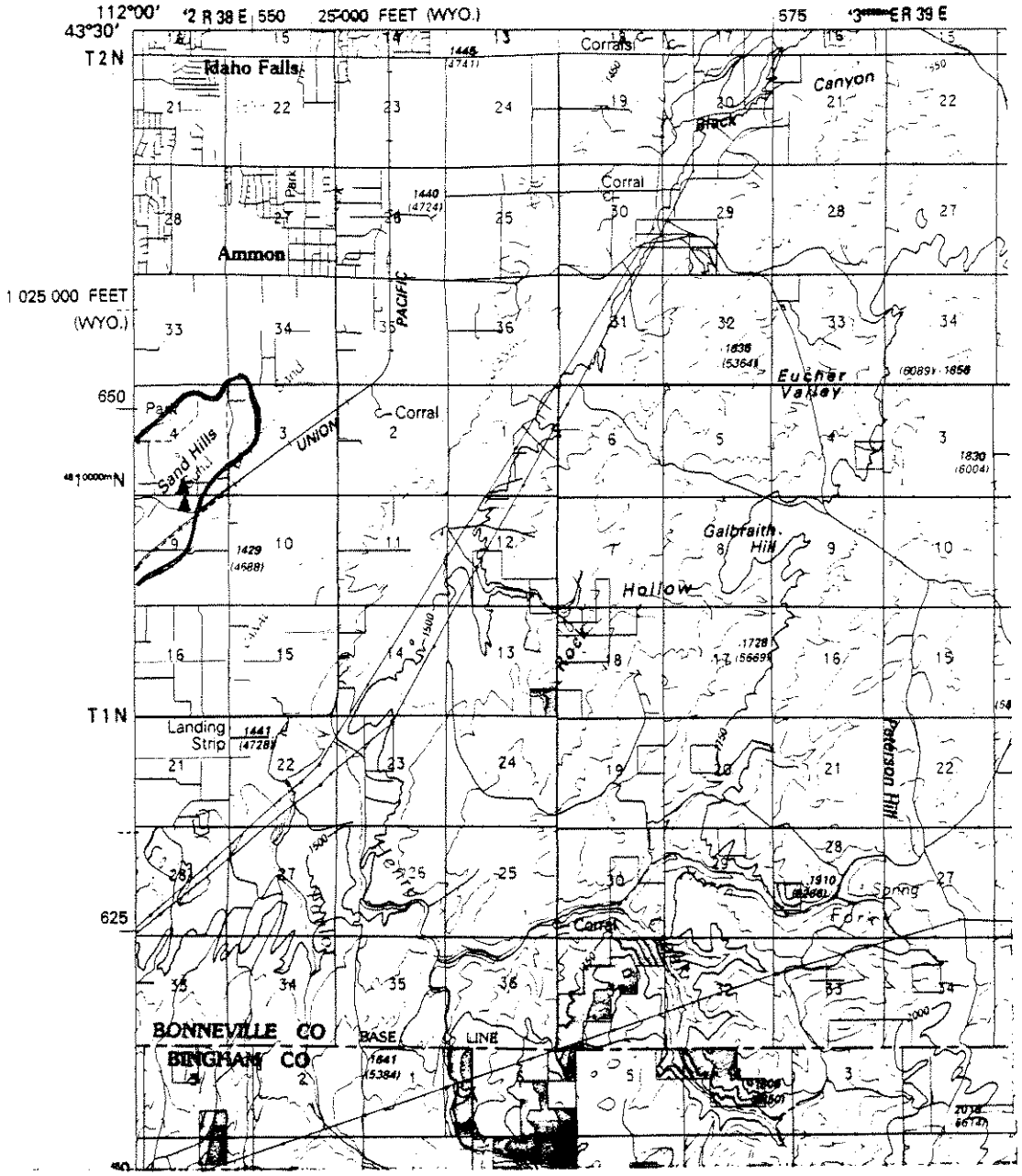
Attachment 1d. Current and potential distribution of the Idaho dunes tiger beetle in Northeastern Idaho. Rexburg 1:100,000 surface management map.



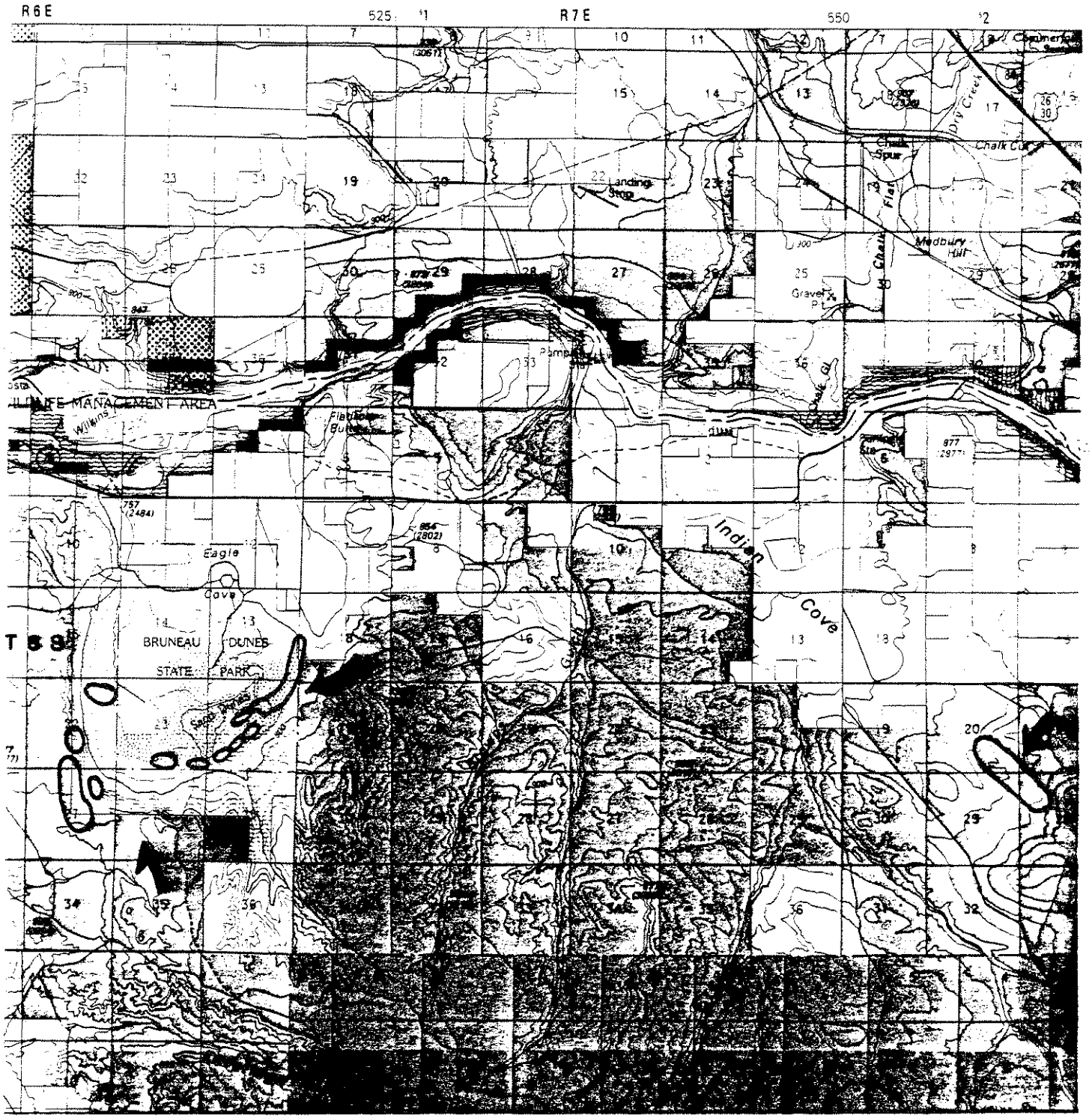
Attachment 1e. Potential distribution of the Idaho dunes tiger beetle in Northeastern Idaho (R. C. Anderson, personal communication 1994). Blackfoot 1:100,000 surface management map.

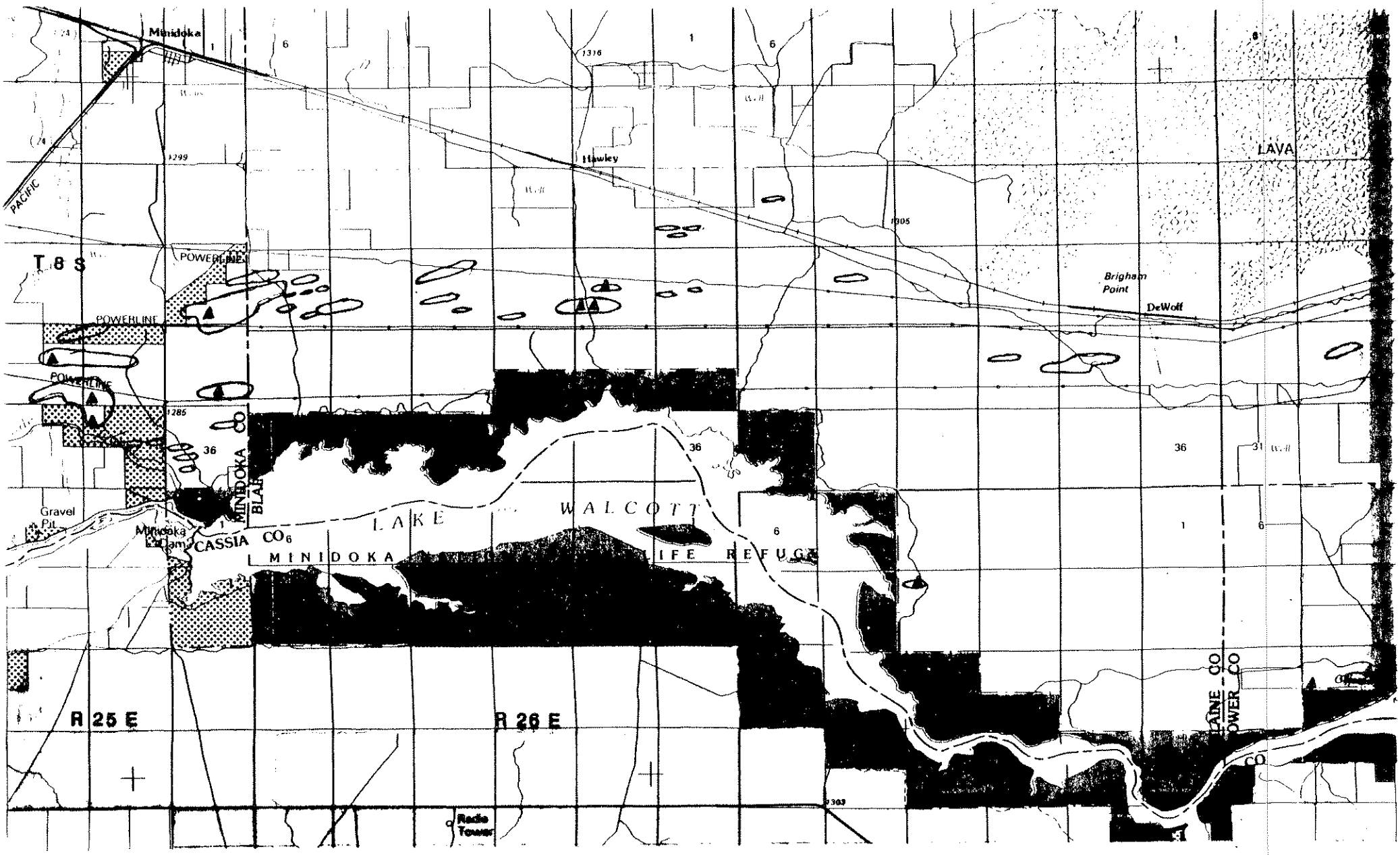


Attachment 1f. Distribution of the Idaho dunes tiger beetle in Northeastern Idaho. Presence of *C. arenicola* documented by D. Logan in 1995 are marked with a ▲. Palisades 1:100,000 surface management map.



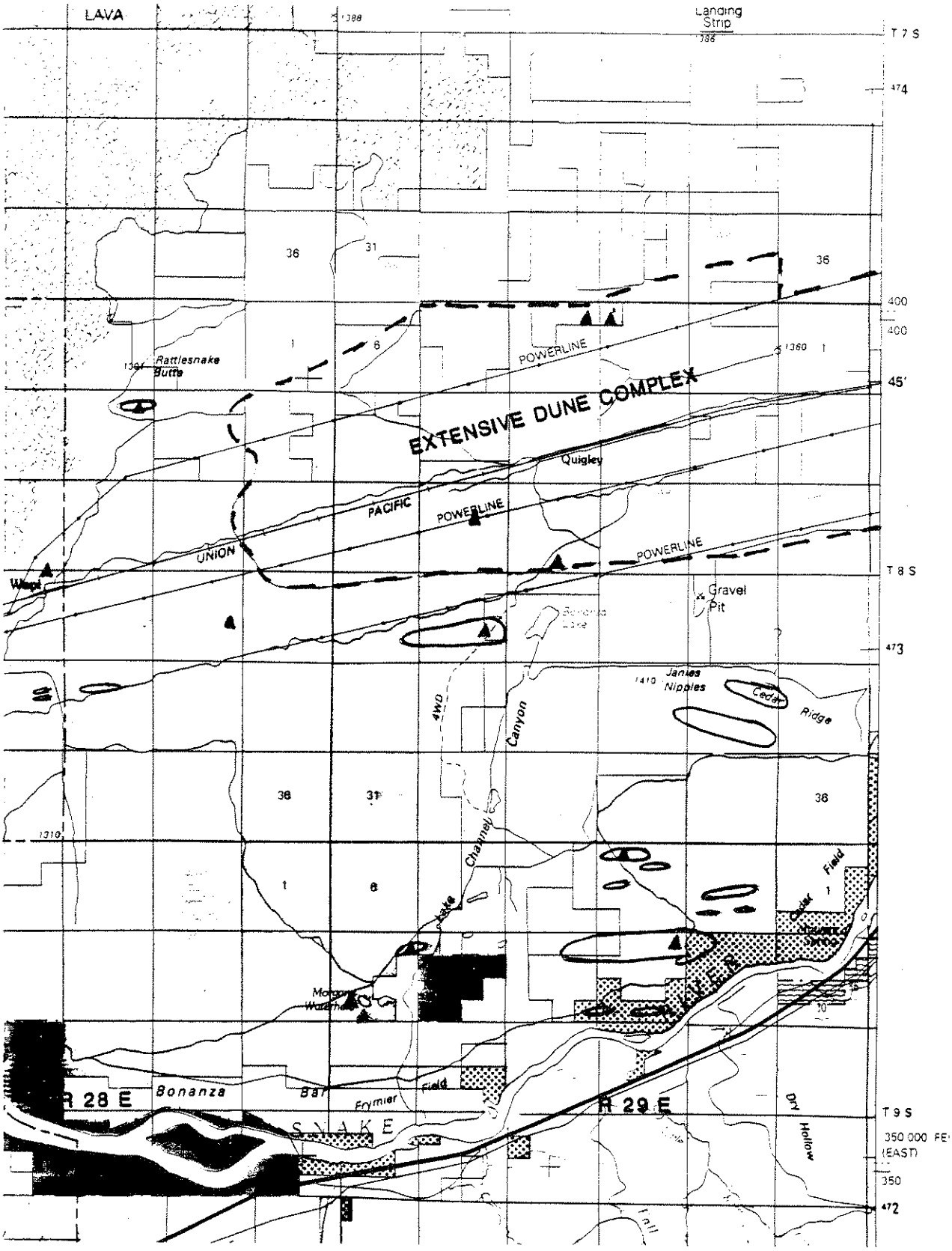
Attachment 2. Distribution of the Idaho dunes tiger beetle in Western Idaho. Baker et al. 1994. Glenns Ferry 1:100,000 surface management map.



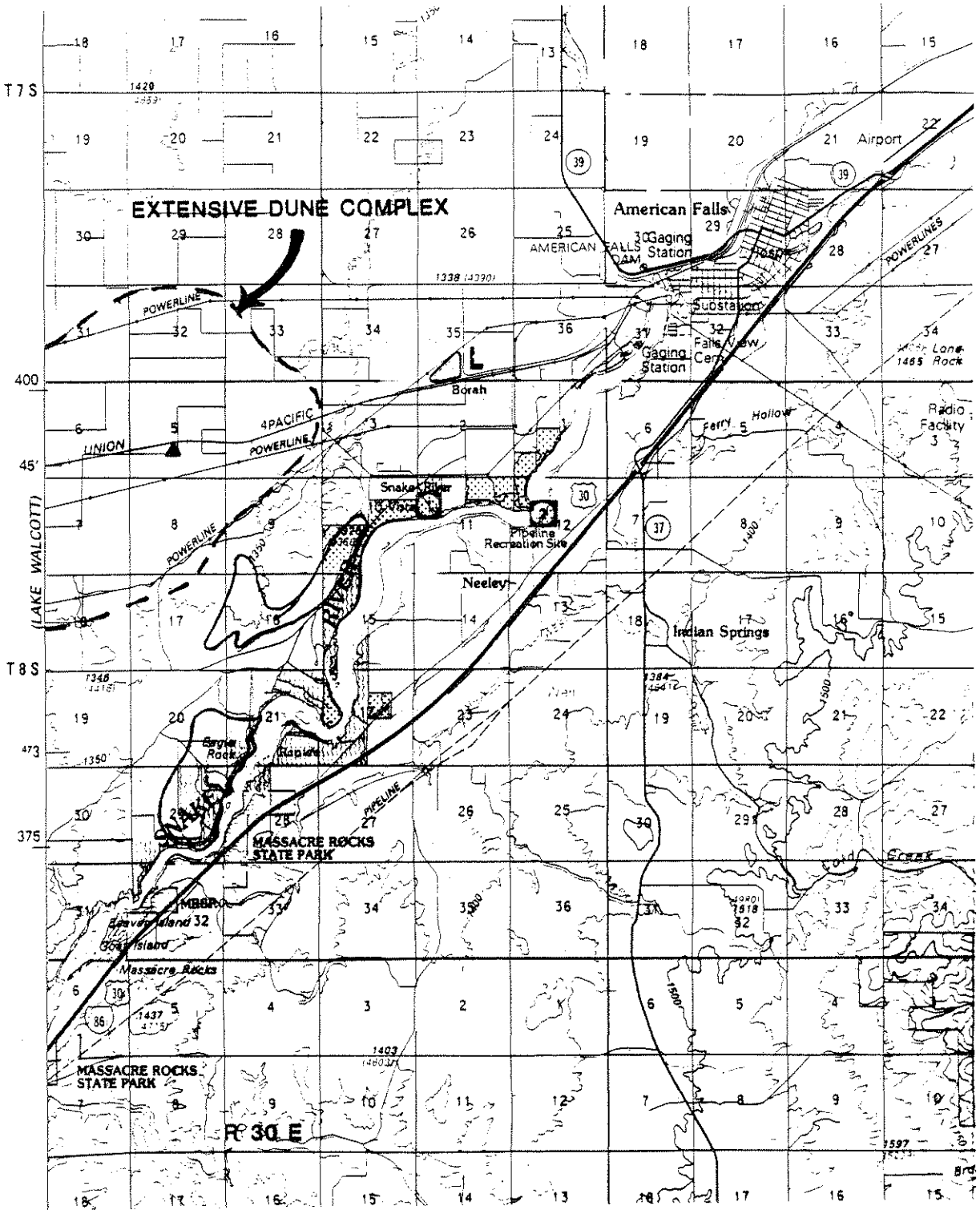


Attachment 3a. Current and potential distribution of the Idaho dunes tiger beetle in Southcentral Idaho. Presence of *C. arenicola* documented since 1992 (Makela 1994; Logan 1995) are marked with a ▲. Walcott 1:100,000 surface management map.

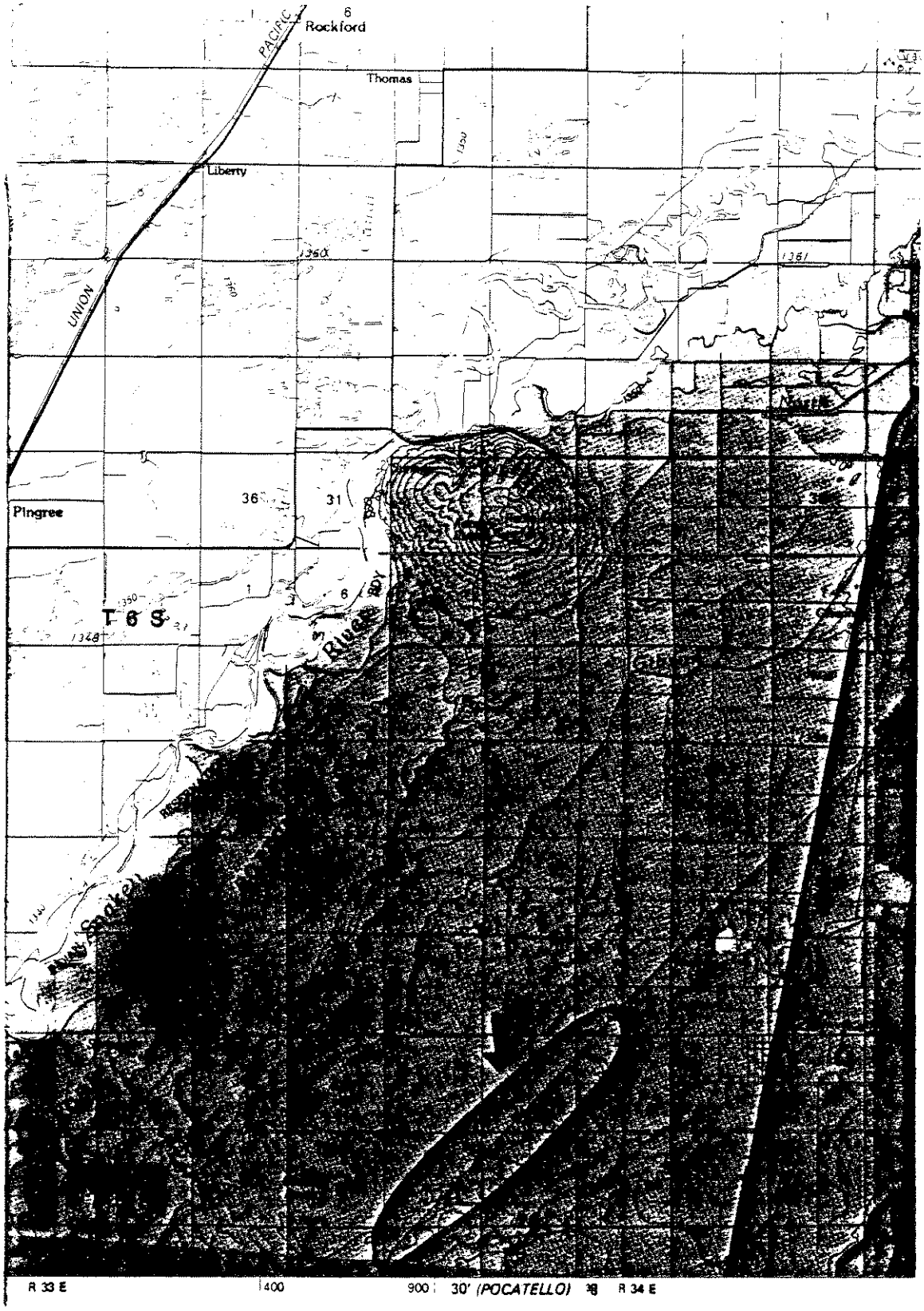
Attachment 3b. Current and potential distribution of the Idaho dunes tiger beetle in Southcentral Idaho. Presence of *C. arenicola* documented since 1992 (Makela 1994; Logan 1995) are marked with a ▲. Walcott 1:100,000 surface management map.



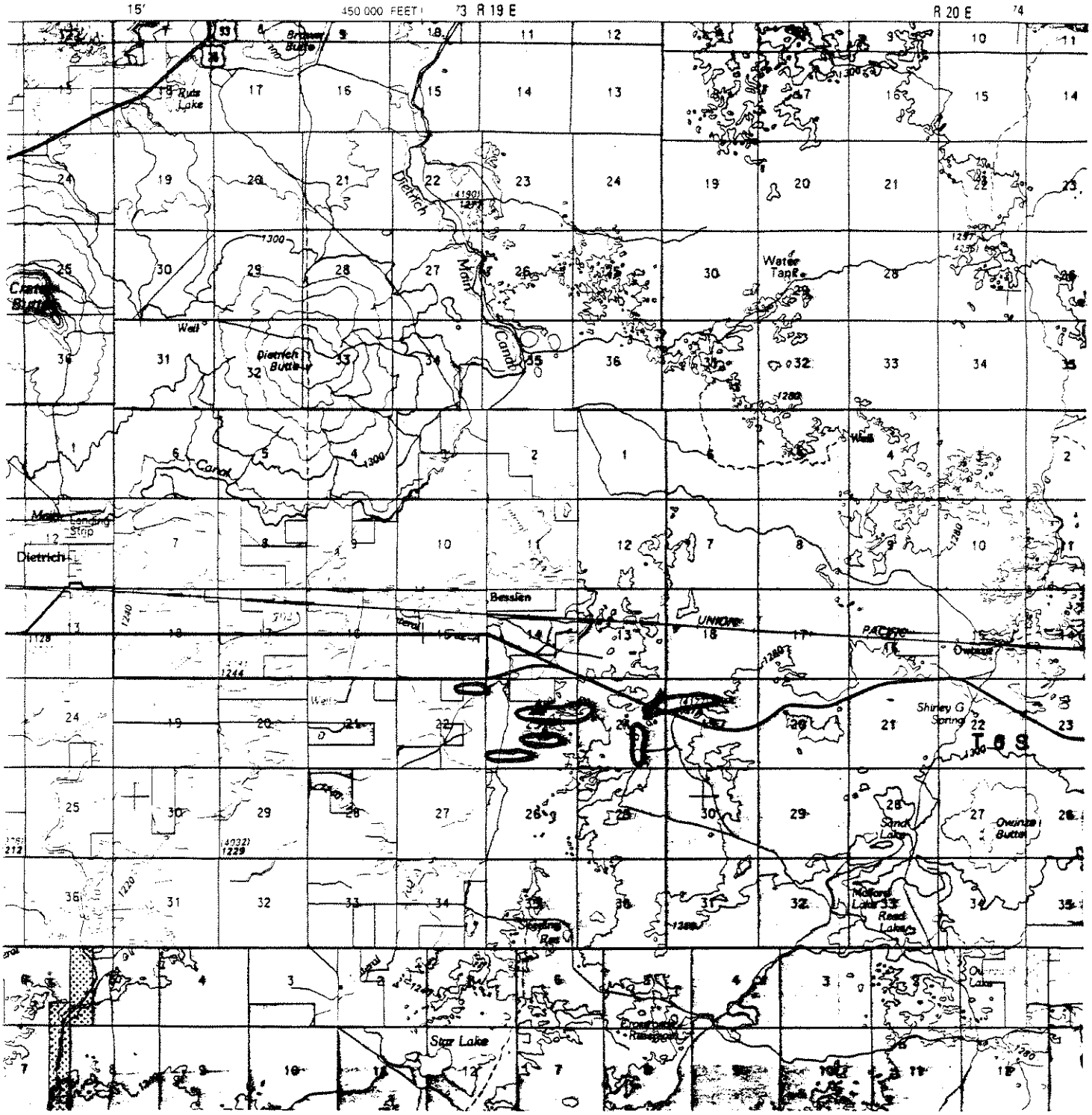
Attachment 3c. Current and potential distribution of the Idaho dunes tiger beetle in Southcentral Idaho. Presence of *C. arenicola* documented since 1992 (Makela 1994; Logan 1995) are marked with a ▲. Pocatello 1:100,000 surface management map.



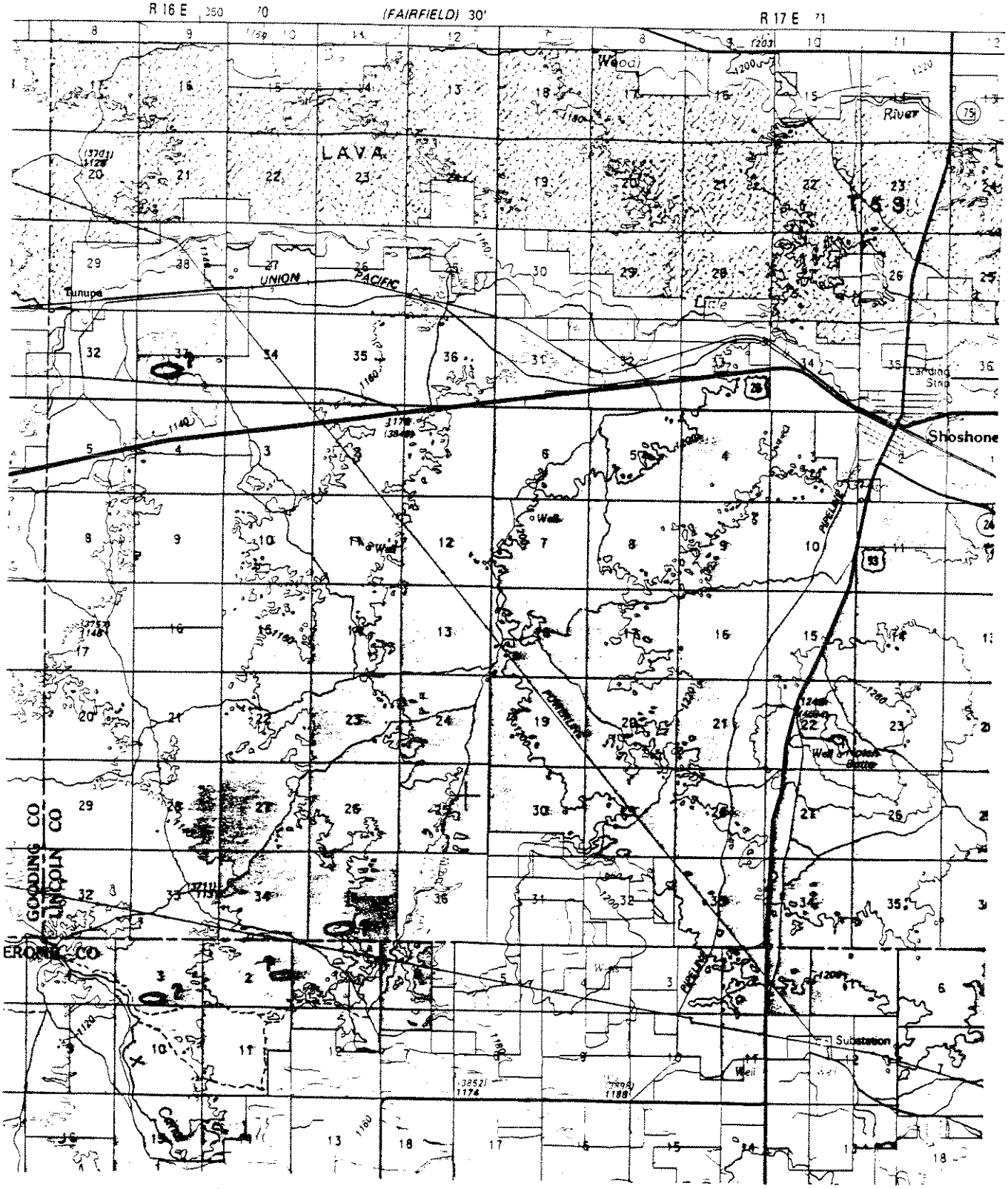
Attachment 3d. Potential distribution of the Idaho dunes tiger beetle in Southcentral Idaho (R. C. Anderson, personal communication 1994). Blackfoot 1:100,000 surface management map.



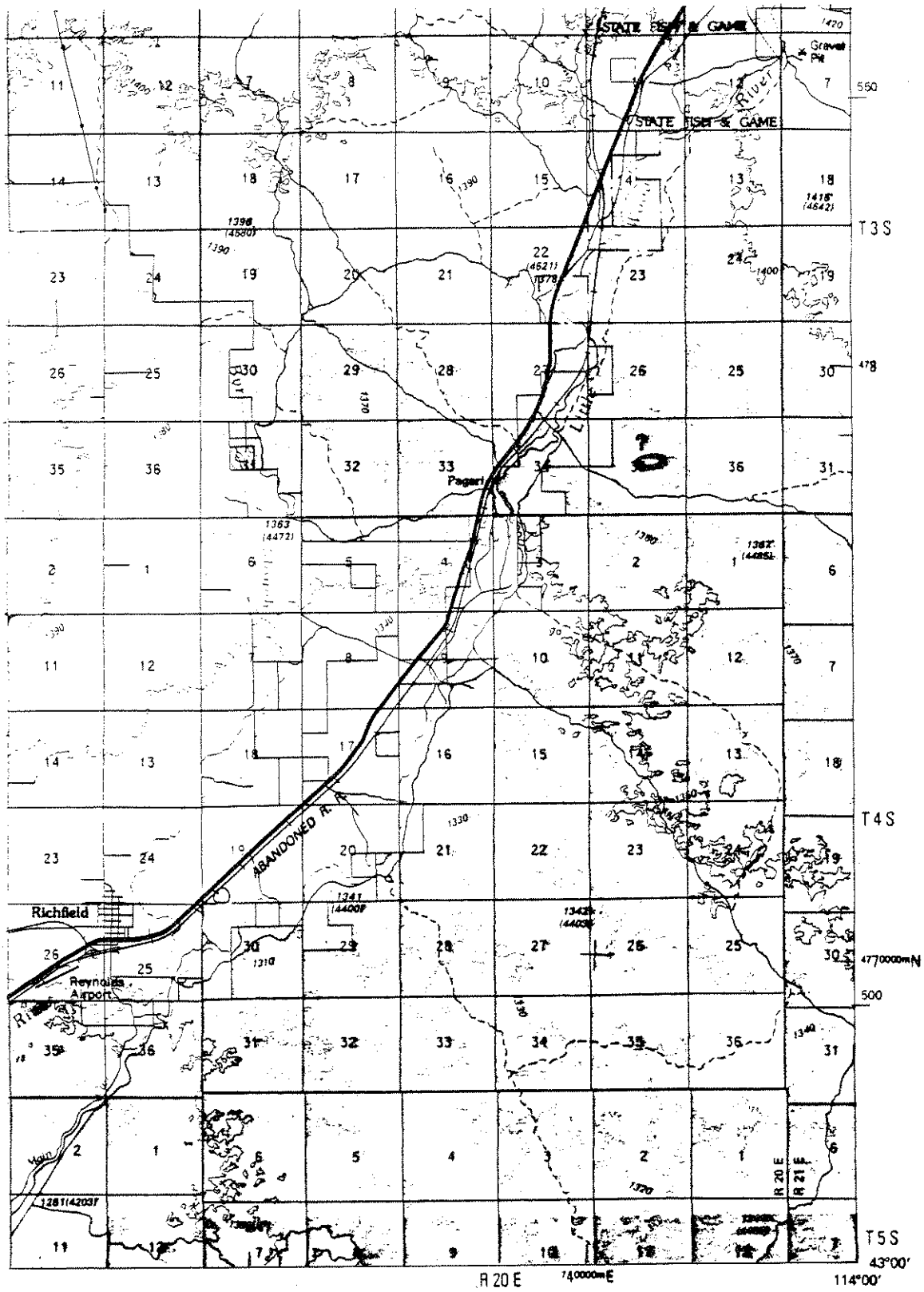
Attachment 3e. Current distribution of the Idaho dunes tiger beetle in Southcentral Idaho. Presence of *C. arenicola* documented in 1995 are marked with a ▲ (Makela, unpublished data; Logan 1995). Twin Falls 1:100,000 surface management map.



Attachment 3f. Potential distribution of the Idaho dunes tiger beetle in Southcentral Idaho. A "?" indicates an area of apparently suitable habitat but *C. arenicola* not observed (Logan 1995). Twin Falls 1:100,000 surface management map.



Attachment 3g. Potential distribution of the Idaho dunes tiger beetle in Southcentral Idaho. A "?" indicate an area of apparently suitable habitat but *C. arenicola* not observed (Logan 1995). Fairfield 1:100,000 surface management map.



ATTACHMENT 4: CONSERVATION ASSESSMENT AND STRATEGY TEAM MEMBERS AND TECHNICAL COMMITTEE REPRESENTATIVES

Conservation Assessment and Strategy Team Members

Dr. Robert C. Anderson, Entomologist, Idaho State University, Pocatello, Idaho.

Dr. Charles Baker, Entomologist, Boise State University, Boise, Idaho.

Steve Bouffard, Wildlife Biologist, USDI Fish and Wildlife Service Southeast Idaho Refuge Complex, Pocatello, Idaho.

Wade Brown, Outdoor Recreation Planner, USDI Bureau of Land Management, Idaho Falls, Idaho.

Michael Donahoo, Ecological Services, USDI Fish and Wildlife Service, Pocatello, Idaho.

Jeff Gardetto, Wildlife Biologist, USDI Bureau of Land Management, Idaho Falls, Idaho.

Chris Ketchum, Natural Resource Specialist, USDI Bureau of Reclamation, Burley, Idaho.

Jim Klott, Wildlife Biologist, USDI Bureau of Land Management, Twin Falls, Idaho.

Paul Makela, Wildlife Biologist and Conservation Assessment and Strategy Team Leader, USDI Bureau of Land Management, Burley, Idaho.

Russ McFarling, Wildlife Biologist, USDI Bureau of Land Management, Idaho Falls, Idaho.

Karen Rice, Ecologist, USDI Bureau of Land Management, Idaho Falls, Idaho.

Wes Whitworth, Manager, Bruneau Dunes State Park, Idaho Dept. of Parks and Recreation.

Technical Committee Members

Rich Howard, USDI Fish and Wildlife Service, Boise, Idaho.

Lyle Lewis, USDI Bureau of Land Management, Twin Falls, Idaho.

ATTACHMENT 5: LITERATURE CITED

Anderson, R. C. 1988. The dunes tiger beetle. Final report for BLM Contract ID-030-CT8-001. Bureau of Land Management, Idaho Falls District. 11pp.

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Baker, C. W., J. C. Munger, L. McCauley, M. Olson, and G. Stevens. 1994. Bruneau Dunes tiger beetle inventory. Idaho Bureau of Land Management Technical Bulletin 94-1. 45pp.

Bauer, K. L. 1989. Observations on the developmental biology of *Cicindela arenicola* Rumpp (Coleoptera:Cicindelidae). M.S. Thesis, Idaho State University, Pocatello. 33pp.

Bauer, K. L. 1991. Observations on the developmental biology of *Cicindela arenicola* Rumpp (Coleoptera:Cicindelidae). Great Basin Naturalist 51:226-235.

Federal Register. 1984. Review of invertebrate wildlife as endangered or threatened species. 49:21668.

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Rumpp, N. L. 1967. A new species of *Cicindela* from Idaho. (Coleoptera:Cicindelidae). Proc. Calif. Acad. Science. 35:129-139.

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