UNITED STATES GOVERNMENT

memorandum

MAR 11 1996

DATE: Field Supervisor, Ecological Services, North Dakota Field Office
Bismarck, North Dakota

REPLY TO ATTN OF:

SUBJECT: "Butterfly Surveys in North Dakota: 1995"

TO: Project Leader, Tewaukon NWR
Cayuga, North Dakota (Attn: K. Askerooth)

REF. MGR.	
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ADMIN. SUP. ASST.	
MAINT. WORKER	
BIOLOGIST	
LABORER	
BIO. TECH	

I have enclosed a copy of a report, for your information, entitled "Butterfly Surveys in North Dakota: 1995" by Tim Orwig, Morningside College. The surveys were conducted primarily in southeastern North Dakota on two U.S. Fish and Wildlife Service tracts, three sites owned by The Nature Conservancy, and four private land sites. The report describes butterfly techniques such as surveying, habitat mapping, and population estimating and makes preliminary management recommendations for sites with rare species. If additional information is required, please contact Mike Olson of my staff at 701-250-4401.

Enclosure

cc: The Nature Conservancy, Bismarck
(Attn: A. Schollett)

Butterfly Surveys in North Dakota: 1995

by Tim Orwig
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November 1995

For
The Nature Conservancy
North Dakota Field Office
1014 E. Central Avenue
Bismarck, ND 58501
and
The U.S. Fish and Wildlife Service

The main goal of this study was to conduct inventories of butterflies and skippers on a number of prairie and wetland sites in North Dakota and determine the location and abundance of the Dakota Skipper (Hesperia dacotae), Powesheik Skipper (Oarisma powesheik), Ottoe Skipper (Hesperia ottoe), Regal Fritillary (Speyeria idalia), and other rare butterflies. The sites inventoried included two U.S. Fish and Wildlife Service areas, Krause WPA and Stack Slough NWR; two sites owned by The Nature Conservancy, Pigeon Point Preserve and Sheridan Prairie Preserve; and four private sites, the Sagvold Tract, the Schultz Tract, Sheldon Seeps, and Brown Ranch. In addition, at the request of Brian Martin, I conducted a follow-up visit to TNC's Cross Ranch Preserve where 1992 surveys found the Dakota Skipper.

Surveys took place from 26 June to 9 July 1995. The Dakota Skipper was documented at six new sites: Hartleben Prairie (Stack Slough NWR), the Schultz Tract, and 4 quarter sections of Brown Ranch. The Powesheik Skipper was found in two new sites at Hartleben Prairie, after having not been recorded anywhere in the state for several years. The Regal Fritillary was found only at Hartleben Prairie. No sightings of the Ottoe Skipper were made, although the Mulberry Wing (Poanes massasoit) again flew at Sheldon Seeps.

This report will document the results of the survey, grouped by site, and detail sightings of rare species. It will also make preliminary recommendations on management for sites with rare species. An appendix will show locations of all rare butterfly sightings on 5 site maps. Species names throughout the report follow Royer (1988), the standard reference for North Dakota.

As in the 1994 survey of Cross Ranch, survey technique entailed walking transects of sites and recording the presence of species by quarter section, and exact locations of rare species. As suggested by Brown (1972), edge areas between habitats were also surveyed. Once populations of Dakota Skippers were located, the habitat they occupied were to be mapped and population size estimated using techniques outlined by Pollard (1977), Thomas (1983), and Gall (1985). However, the low numbers of species of any site made this impractical. Presence in each section was confirmed by netting and releasing

specimens, or by vouchering questionable specimens for later identification to species. Voucher specimens remain in the collection of the author, although some will be forwarded to Dr. Ronald Royer at Minot State University for curation in North Dakota collections. The author's collection will eventually be deposited in a public research collection.

Despite a number of heavily overcast days, a high haze from forest fires in Canada, and several consecutive mornings of surveys which followed heavy evening downpours, the results from these site surveys indicated the presence of a number of rare species. However, none of the sites had both the numbers of rare species and the acreage to indicate a secure population. Altogether, these 1995 surveys documented over 900 individuals of 45 species of butterfly in North Dakota. Sixteen of the records, indicated by an *, are probable county records (final determination to be made by R. Royer). Most important is the rediscovery of the Powesheik Skipper in southeast North Dakota, after several years without any sightings. Additional documentation of the Powesheik's presence on three other sites in the Hankinson/Lidgerwood area by K. Roever (pers. comm.) indicates that further surveys for the presence of this species in North Dakota are warranted.

It was also encouraging to locate new populations of Dakota Skipper near the Sheyenne National Grassland. The potential of maintaining a viable population of the Dakota Skipper on Brown's Ranch and other currently private areas near the Sheyenne is still high. Considering the current condition of most of the Sheyenne NG prairie, these sites should probably stay under the ownership of private individuals, The Nature Conservancy, or an alternate federal ownership.

1. Krause Wildlife Production Area

Krause WPA is on the northeast corner of Tewaukon National Wildlife Refuge in Sargent County (E1/2 of NE1/4 of Sec. 5 and NW1/4 of Sec. 4, T129N, R53W, Kingston Twp.), and includes most of Krause Slough. Surveys took place from 3:10 to 4:40 p.m. on 27 June 1995. The temperature was 72 degrees and the weather was 100% overcast. The site is highly disturbed, although there are some good prairie plants. Although no rare species were observed during my visit, the staff at Tewaukon NWR have observed the Regal Fritillary on the site in past years. Although the likelihood of finding other rare species here is not high, further surveys should be done in better weather.

Species list:

1	Ancyloxypha numitor	Least Skipper*
5-10	Polites mystic	Long Dash*
1	Glaucopsyche lygdamus	Silvery Blue*
2m, 1f	Lycaeides melissa	Melissa Blue
1	Basilarchia archippus	Viceroy*
20+	Coenonympha inornata	Inornate Ringlet*
1	Danaus plexippus	Monarch

2. Stack Slough National Wildlife Refuge

A. Aaser WPA Several days were spent surveying Stack Slough NWR. Stack Slough NWR is north of State Hwy. 11 between Hankinson and Lidgerwood in Richland County. On 27 June 1995, a survey of the Aaser WPA (SW 1/4 of Sec. 7, T130N, R50W), conducted from 11:00 a.m. to 12:30 p.m., yielded the following species. The temperature was 72 degrees, and it was 95% overcast. The site is a recently acquired mostly-native hayfield which floods frequently. Wood lily and deathcamass grow on the site. Although conditions at the time of the survey were not ideal, this site seems not likely to harbor rare butterflies.

Species list

1m, 1f	Polites themistocles	Tawny-edged Skipper
1	Polites mystic	Long Dash
3	Hyllolycaena hyllus	Bronze Copper
1	Clossiana selene	Silver-bordered Fritillary
1	Coenonympha inornata	Inornate Ringlet

B. Hartleben Prairie A newly acquired piece of Stack Slough NWR is very rich butterfly habitat. Hartleben Prairie is in the NE 1/4 of Sec. 17 and the W1/2 of the NW1/4 of Sec. 16, T130N, R50W, Richland County (Map #1). The area is a high-quality native prairie hayfield that floods frequently. The two areas with highest elevation are the best butterfly habitat: Sec. 17 south of the double railroad bed, and Sec. 16 north of the double railroad bed. Both areas contain deathcamass, wood lily, and showy milkweed, while Sec. 17 also has black-eyed susan, yarrow, prairie turnip, and larkspur. Both areas have some spurge problems, although the spurge is most severe in Sec. 16. The site was surveyed on 28 June 1995, from 10:05 to 12:30, and from 1:25 to 4:45. Despite 95% overcast and winds from the west at 10-20 m.p.h., the following species were observed:

Species list

1	Oarisma powesheik	Powesheik Skipper (caught at 3:30)
5	Polites themistocles	Tawny-edged Skipper
15	Polites mystic	Long Dash
2	Colias philodice	Common Sulphur
1	Colias eurytheme	Orange Sulphur
2	Hyllolycaena hyllus	Bronze Copper
4	Clossiana selene	Silver-bordered Fritillary.
1	Vanessa atalanta	Red Admiral

A follow-up visit to the site on 4 July 1995 confirmed the presence of Powesheik Skipper on the site in numbers. Surveys from 1:30 to 4:00 p.m. in the part of Sec. 17 south of the current railroad bed also added two more rare butterflies to the site list: Dakota Skipper and Regal Fritillary. Although it was 100% overcast all afternoon, the 70 degree temperature yielded the following species:

Species list

1	Oarisma powesheik	Powesheik Skipper
4	Hesperia dacotae	Dakota Skipper
2	Polites peckius	Peck's Skipper
3	Polites themistocles	Tawny-edged Skipper
5	Polites mystic	Long Dash

1	Colias philodice	Common Sulphur
1	Hyllolycaena hyllus	Bronze Copper
3	Speyeria cybele	Great Spangled Fritillary
3	Speyeria idalia	Regal Fritillary
2	Clossiana bellona	Meadow Fritillary
1	Phyciodes tharos	Pearly Crescentspot
2	Basilarchia archippus	Viceroy
16	Cercyonis pegala	Common Wood Nymph

Only one rare butterfly, a Regal Fritillary, was sighted over the low ground between the current and abandoned railroad beds in this section. Besides periodic inundation, these areas suffer from a lack of nectar sources for the butterflies; the Regal appeared to be simply crossing the area. Most of the butterflies observed were on the two low ridges south of the abandoned railroad right-of-way. One Regal was perched on a thistle and the other was scared up from the grass. All Dakota Skipper sightings were between 3:05 and 3:35. Two male Dakotas were captured as they flew a dogfight over the site. Another Dakota was perched on a showy milkweed at the highest point of the ridge. The fourth Dakota, a female flushed out of the grass, was netted and released.

On 4 July 1995 I also surveyed the portion of Sec. 16 north of the railroad beds, from 4:10 to 6:00.

17	Oarisma powesheik	Powesheik Skipper
1	Colias philodice	Common Sulphur
2	Hyllolycaena hyllus	Bronze Copper
1	Satyrodes eurydice	Northern Eyed Brown
1	Coenonympha inornata	Inornate Ringlet
2	Cercyonis pegala	Common Wood Nymph

The best habitat for the Powesheik was in the disturbed area next to the small field which occupied the north east part of this eighth section, which is also the site of greatest leafy spurge infestation. Because of the heavy rains in the ensuing days, much more of Hartleben was inundated than on my first visit.

Special Management Recommendations for Hartleben Prairie

Because this site is unlike the other prairie sites in this survey, and harbors three rare species of butterflies, special management considerations should be followed. As always, the previous management history of the site should be documented; apparently late-season haying was the only management on this site. McCabe (1981) has recommended late-season haying for Dakota Skipper sites. The USF&WS might want to cut back on the frequency of that haying, though, as it may have reduced populations of Dakota Skipper at some sites, and leave at least six inches of stubble (Moffat & McPhillips 1993). Royer and Marrone (1992c) indicate that the Powesheik Skipper "appears to be resilient under some haying regimes." To introduce more nectar sources for the site, it would be appropriate to convert the current field in the corner of Sec. 16 to prairie or plant it in alfalfa.

Because the two halves of this site with good butterfly habitat are completely separated by inundated habitat, a path and two railroad beds, they must be treated as separate sites and managed individually. While Regals can obviously cross the railroad beds and wet areas without problems, the more restricted Powesheik and Dakota may not be able to. Schlicht

found that butterflies were unable to cross chain link fences at Big Sand Mound in southeast Iowa, and seemed unable to cross a road at Glacial Lakes in Minnesota (pers. comm.). Research by Ehrlich and others on butterflies inhabiting serpentine barrens in California indicates that some habitat-restricted species are very sedentary and unlikely to move far.

Although encroachment by woody plants on these sites would be detrimental, fire is not recommended as a management tool for the Dakota Skipper (Royer & Marrone 1992a) generally, and especially not for these sites, because of their extreme small size. Certainly each of the two high-quality portions should be treated as a separate management unit if fire is used, and should be highly subdivided and burned on an extreme long-term rotation. Because of the surrounding wetlands, fire may not have been a significant part of the natural ecosystem on this site, except in years of drought. Since the site is isolated from nearby prairie of significant quality, natural cycles of recolonization of a burned area by insects from the surrounding prairie no longer work; the populations will have to survive on site in spite of fire.

Both sites have small but significant leafy spurge infestation problems. These should be handled swiftly but very carefully by wick application of herbicide. The area of heaviest infestation in Sec. 16, for example, is also the center of the Powesheik population. Blanket-spraying spurge management is likely to destroy the forbs which adults need for nectar sources without completely eradicating the problem.

3. Pigeon Point Preserve

Brian Martin asked me to survey the westernmost part of Pigeon Point Preserve, W1/2 of W1/2 of Sec. 19, T135N, R53W, in Ransom County. The area is a steep prairie remnant surrounding a small creek which empties into the Sheyenne River at the northwestern corner of the section. There is considerable brushy growth along the several beaver ponds which the creek passes through, and the uplands are heavily infested with leafy spurge, reducing the potential habitat for rare butterflies considerably. Prairie plants encountered include pasture sage (Artemisia frigida), coneflower, leadplant, larkspur, wood lily, and showy milkweed. I visited the site on 3 July 1995 from 10:15 to 1:30. The sky was 20% overcast, with temperatures 64-70 degrees F. and winds from the NE at 10-20 m.p.h. The variety of habitat in the site does make for a good list of commoner butterflies.

Species list

1	Polites themistocles	Tawny-edged Skipper
5	Polites mystic	Long Dash
1	Colias philodice	Common Sulphur
5	Hyllolycaena hyllus	Bronze Copper
1	Satyrium edwardsii	Edwards' Hairstreak
1	Satyrium calanus	Banded Hairstreak
7	Celastrina argiolus	Spring Azure
3	Speyeria cybele	Great Spangled Fritillary
1	Charidryas nycteis	Silvery Checkerspot
2	Polygonia progne	Gray Comma
1	Vanessa atalanta	Red Admiral
6	Basilarchia archippus	Viceroy
7	Satyrodes eurydice	Northern Eyed Brown

1	Megisto cymela	Little Wood Satyr
14	Cercyonis pegala	Common Wood Nymph
3	Danaus plexippus	Monarch

4. Sheridan County Preserve

A preliminary survey on 6 July 1994 of Sheridan Prairie in Sheridan County (1 1/2 miles north of the Burleigh County line and west of State Hwy. 14), yielded seven species despite cold, overcast weather: European Cabbage Butterfly (Artogeia rapae), Common Sulphur (Colias philodice), Great Copper (Gaeides xanthoides), Variegated Fritillary (Euptoieta claudia), Callippe Silverspot (Speyeria callippe), Northern Pearly Crescentspot (Phyciodes pascoensis), and Common Wood Nymph (Cercyonis pegala). The Callippe Silverspot represented a range extension to the east.

On 8 July 1995 I surveyed the site, accompanied by Kathy Martin of the USF&WS's Bismarck office. Between 9:45 and 12:30 we traversed NE1/4 of S29 and SW1/4 of S20, R76W. The weather was 30-100% overcast, and reached 80 degrees F. by noon. Plants observed included harebell, needle & thread, smooth camass, ball cactus, and coneflower.

Species list

4	Oarisma garita	Garita Skipper*
1	Polites mystic	Long Dash*
6	Artogeia rapae	European Cabbage Butterfly
1	Colias philodice	Common Sulphur
1	Hyllolycaena hyllus	Bronze Copper
2	Lycaeides melissa	Melissa Blue
1	Speyeria cybele	Great Spangled Fritillary*
12	Speyeria callippe	Callippe Silverspot
2	Clossiana selene	Silver-bordered Fritillary*
1	Vanessa cardui	Painted Lady*
9	Coenonympha inornata	Inornate Ringlet*
1	Cercyonis pegala	Common Wood Nymph

During the afternoon I surveyed the area of Sheridan Prairie north of the headwater marsh of Sperry Lake: NW1/4 S20 and SW1/4 of S17, from 1:15 to 4:35. Plants observed include ball cactus, coneflower, silver-leaf scurf pea, blanket flower, deathcamass, and black-eyed susan. For most of the afternoon, the overcast averaged 50%.

Species list

11	Oarisma garita	Garita Skipper
1	Polites mystic	Long Dash
4	Artogeia rapae	European Cabbage Butterfly
1	Colias eurytheme	Orange Sulphur
1	Hyllolycaena hyllus	Bronze Copper
4	Lycaeides melissa	Melissa Blue
18	Speyeria callippe	Callippe Silverspot
2	Clossiana selene	Silver-bordered Fritillary
3	Vanessa cardui	Painted Lady
1	Vanessa atalanta	Red Admiral*
9	Coenonympha inornata	Inornate Ringlet

3 Cercyonis pegala Common Wood Nymph

From 5:20 to 6:20, I surveyed the NE1/4 of S30. No new species were found.

Species list

3	Oarisma garita	Garita Skipper
6	Lycaeides melissa	Melissa Blue
14	Speyeria callippe	Callippe Silverspot
2	Clossiana selene	Silver-bordered Fritillary
7	Coenonympha inornata	Inornate Ringlet

Altogether, 17 species have now been recorded from this site. Although seven of these sightings may be new county records, none of the rare survey target species were found anywhere on the site. This was disappointing, considering the potential of this handsome prairie.

5. Sagvold Tract

On 1 July 1995, from11:00 to 12:15, I surveyed the Sagvold Tract, NW1/4 of S16, T134N, R53W, Ransom County, a flat private quarter section surrounded on three sides by the Sheyenne NG. The site was heavily grazed and infested with leafy spurge. There were some good prairie plants: needle & thread, wood lily, leadplant, black-eyed susan, wild rose, and shell-leaf penstemon. But there were few butterflies in this section:

Species list

3	Polites themistocles	Tawny-edged Skipper
3	Polites mystic	Long Dash
1	Basilarchia archippus	Viceroy
4	Coenonympha inornata	Inornate Ringlet
1	Cercyonis pegala	Common Wood Nymph

6. Schultz Sand Savannah

A better private site, totally surrounded by the Sheyenne NG, is the Schultz Tract, SW1/4 S24, T134N, R54W, Ransom County (Map #2). Initially I got lost looking for this site, so I surveyed a bit of the surrounding lands, without finding much of interest. The neighboring portion of the National Grassland is heavily grazed and nearly devoid of forbs because of spraying for leafy spurge. However, the Schultz Tract is still of fairly high quality, although there is considerable infestation of leafy spurge in the eastern half. The northeastern corner is an oak/aspen sand savannah, while the rest is mainly mesic prairie. Within the dunes in the sand savannah is a large population of a tiger beetle, Cicindela formosa manitoba, "common on sandy soil in North Dakota and Manitoba," according to Steve Spomer of the University of Nebraska at Lincoln, who determined a specimen to subspecies. The numbers of hairstreaks below are only those specimens which I was able to net and identify. Dozens of hairstreaks congregated in the higher branches of the oaks, on the lee side in full sun. I surveyed the site from 1:00 to 5:20 p.m. on 30 June 1995. Some of the plants observed on the site were yarrow, shell-leaf penstemon, larkspur, pasture sage, wood lily, wild rose, sage, yellow coneflower, deathcamass, purple

coneflower, and needle and thread. The Dakota Skipper was sighted at 4:09, perched on black-eyed susan.

Species list

1	Hesperia dacotae	Dakota Skipper
2	Polites peckius	Peck's Skipper
4	Polites themistocles	Tawny-edged Skipper
24	Polites mystic	Long Dash
3	Artogeia rapae	European Cabbage Butterfly
1	Colias eurytheme	Orange Sulphur
3	Satyrium calanus	Banded Hairstreak
1	Satyrium liparops	Striped Hairstreak
16	Phyciodes tharos	Pearl Crescent
1	Nymphalis antiopa	Mourning Cloak
2	Basilarchia archippus	Viceroy
4	Coenonympha inornata	Inornate Ringlet
5	Cercyonis pegala	Common Wood Nymph

7. Sheldon Seeps

Sheldon Seeps is a large high-quality wetland area, S1/2 of Sec. 14, T135N, R54W, in Ransom County (Map #3). I surveyed the site from 2:00 to 5:10 p.m. on 3 July 1995; the weather was 80% clear, 70 degrees F., with NE winds 10-20 m.p.h. The site has been extensively surveyed in the past (Royer & Marrone 1992b), and this survey added little to what is already known about the site. Of interest was the capture of a very fresh specimen of the Mulberry Wing (Poanes massasoit) on the site at 4:10, resting low in the grasses in 1 foot of water. A pair of Silvery Checkerspots (Charidryas nycteis) was observed mating. This site is generally a high quality wetland, with wood lily, death camass, leadplant, cup plant, and poplar in the surrounding grasslands. There is some leafy spurge infestation which should be treated conservatively.

Species list

18	Polites mystic	Long Dash
1	Poanes massasoit	Mulberry Wing
1	Poanes hobomok	Hobomok Skipper
1	Colias philodice	Common Sulphur
8	Hyllolycaena hyllus	Bronze Copper
18	Celastrina argiolus	Spring Azure
8	Charidryas nycteis	Silvery Checkerspot
29	Phyciodes tharos	Pearl Crescent
11	Polygonia progne	Gray Comma
3	Nymphalis antiopa	Mourning Cloak
3	Vanessa atalanta	Red Admiral
1	Basilarchia a. arthemis	White Admiral
15	Basilarchia archippus	Viceroy
1	Enodia anthedon	Northern Pearly Eye
40	Satyrodes eurydice	Northern Eyed Brown
1	Cercyonis pegala	Common Wood Nymph

8. Brown Ranch

The most significant finding of the survey was establishing a number of individuals of the Dakota Skipper on widely-separated sites on the high quality prairies of Brown's Ranch, southwest of McLeod in Ransom County. Because of the size of the ranch and the quality of the remnants, this site has the potential to host a meta-population of the Dakota Skipper; it may be the best site remaining in southeastern North Dakota, and the last hope for supporting the species in the Sheyenne River ecosystem. Because of the size of the ranch, surveys took place over 3 days, and are reported below by quarter section. I was asked to survey 8 of the quarter sections. A total of 5 Dakota Skippers were found in 4 quarter sections (E, F, G, C): SW 1/4 Sec. 28, T134 N, R53W; NE 1/4 Sec. 5, T133 N, R53W; SE 1/4 Sec. 5, T133 N, R53W; and NW 1/4 Sec. 9, T133 N, R53W.

A. SE1/4 Sec. 3, T133 N, R53W. Surveyed 29 June 1995, 12:00 to12:45 p.m., temperature 65 degrees F., 90% overcast, winds W 15-25 m.p.h. This was a nice prairie, potentially good Dakota Skipper habitat. Plants observed included leadplant, wild rose, deathcamass, wood lily, black-eyed susan, but no leafy spurge. It was being grazed, and an overly friendly herd cut short my observations. Although the prairie as a whole did not appear overgrazed, some of the hilltops which gave the best potential for Dakota Skipper were the most worn.

Species list

1	Polites themistocles	Tawny-edged Skipper
2	Coenonympha inornata	Inornate Ringlet

B. SE1/4 Sec. 4, T133 N, R53W. Surveyed 29 June 1995, 3:30 to 4:15 p.m., temperature 67 degrees F., 95% overcast, winds W 15-25 m.p.h. This site was heavily grazed and had the worst leafy spurge infestation problem on the ranch, although it also harbored some good plants: shell-leaf penstemon, leadplant, wild rose, black-eyed susan, yarrow, puccoon, pasture sage, and deathcamass. No butterflies were observed.

C. NW 1/4 Sec. 9, T133 N, R53W (Map #4). Surveyed 29 June 1995, 1:00 to 3:15 p.m., temperature 66 degrees F., 85% overcast, winds W 15-25 m.p.h. This hayed prairie is probably the best quality of any on the ranch, and occupies the entire quarter section, with the exception of a previously cultivated patch in the southernmost 100 yds., now planted to alfalfa. Plants observed in this quarter section included leadplant, deathcamass, black-eyed susan, wood lily, astragalus sp., needle and thread, and shell-leaf penstemon. The male Dakota Skipper challenged me at 1:40.

Species list

1	Hesperia dacotae	Dakota Skipper
5	Polites themistocles	Tawny-edged Skipper
1	Polites mystic	Long Dash
1	Artogeia rapae	European Cabbage Butterfly
1	Coenonympha inornata	Inornate Ringlet
1	Cercyonis pegala	Common Wood Nymph

A return visit to the site from 4:50 to 5:30 on 29 June 1995 yielded 1 Long Dash.

D. NW 1/4 Sec. 28, T134 N, R53W. Surveyed, on 1 July 1995, the western part of this quarter section, from 1:25 to 2:00. The weather was 40% overcast, 71 degrees F., and

winds N 0-5 m.p.h. Heavy grazing has made this site poor habitat for the Dakota Skipper, although the northwestern quarter may never have been Dakota habitat. Plants seen included leadplant, sage and several patches of spurge. I observed 1 Long Dash (Polites mystic) and 1 Coral Hairstreak (Harkenclenus titus)*. I exited the site through the eastern part of the quarter section, a heavily grazed area, observing 2 Long Dash during a 5:10 to 5:40 survey.

E. SW 1/4 Sec. 28, T134 N, R53W (Map #5). Surveyed onl July 1995 from 2:00 to 5:10. The weather was 40% overcast, 71 degrees F., and winds N 0-5 m.p.h. This quarter section was less intensively grazed, and yielded a male (2:47 p.m.) and female (2:58) Dakota Skipper, both perched on black-eyed susan.

Species list

1m, 1f	Hesperia dacotae	Dakota Skipper
1	Polites peckius	Peck's Skipper
71	Polites themistocles	Tawny-edged Skipper
9	Polites mystic	Long Dash
1	Hyllolycaena hyllus	Bronze Copper
2	Clossiana bellona	Meadow Fritillary
1	Phyciodes pascoensis	Northern Pearly Crescentspot
1	Vanessa virginiensis	American Painted Lady*
1	Basilarchia archippus	Viceroy
24	Coenonympha inornata	Inornate Ringlet
3	Cercyonis pegala	Common Wood Nymph

F. NE 1/4 Sec. 5, T133 N, R53W (Map #4). Surveyed on 2 July 1995 from 11:30 to 2:30. The temperature started at 63 degrees F., and the winds were from the S 5-15. A light rain shower delayed the beginning of the survey until late morning, and the overcast during the survey period ranged from 100% to 60%. One male Dakota Skipper was caught at 12:35, perched on black-eyed susan. Other plants observed included leadplant, deathcamass, wood lily, yarrow, and needle grass. The northern end is a partially wooded savannah, and has a disturbed area around a flowing well.

Species list

1	Hesperia dacotae	Dakota Skipper
3	Polites peckius	Peck's Skipper
53	Polites themistocles	Tawny-edged Skipper
9	Polites mystic	Long Dash
1	Atrytone logan	Delaware Skipper
1	Colias philodice	Common Sulphur
1	Hyllolycaena hyllus	Bronze Copper
1	Epidemia helloides	Purplish Copper*
1	Satyrium acadica	Acadian Hairstreak
1	Satyrium calanus	Banded Hairstreak
1	Strymon melinus	Gray Hairstreak*
1	Celastrina argiolus	Spring Azure
1	Lycaeides melissa	Melissa Blue
1	Vanessa atalanta	Red Admiral
2	Basilarchia archippus	Viceroy
2	Megisto cymela	Little Wood Satyr
9	Coenonympha inornata	Inornate Ringlet

10 Cercyonis pegala Common Wood Nymph

G. SE 1/4 Sec. 5, T133 N, R53W (Map #4). Surveyed on 2 July 1995 from 2:45 to 5:15. The temperature was 70 degrees F., and the winds were from the S 3-12. The skies were 70% overcast with a high haze. This section was more heavily grazed than the northern part, and has a small cultivated area and some outbuildings. There was apparently overseeding with alfalfa in the southern end, and more spurge generally. Prairie plants in this section included wood lily and deathcamass. As in the northern section, the one female Dakota Skipper was taken off of black-eyed susan at 4:33. Petals on the purple coneflower, the most common perching and nectaring plant for the Dakota, were just forming. This late blooming made Dakotas more difficult to survey generally, and may have had a detrimental effect on the Sheyenne valley populations in 1995 generally.

Species list

1	Hesperia dacotae	Dakota Skipper
1	Polites peckius	Peck's Skipper
18	Polites themistocles	Tawny-edged Skipper
1	Atrytone logan	Delaware Skipper
1	Colias philodice	Common Sulphur
1	Satyrium acadica	Acadian Hairstreak
1	Strymon melinus	Gray Hairstreak
1	Basilarchia archippus	Viceroy
2	Coenonympha inornata	Inornate Ringlet
8	Cercyonis pegala	Common Wood Nymph

H. SW 1/4 Sec. 4, T133 N, R53W. I was asked to survey this quarter section also, except for the ranch buildings area. However, it was occupied by cattle and visual observation from three sides of the quarter section showed a heavy grazing history. The site was my lowest priority for survey, and I did not get to it before leaving the area.

Special Management Recommendations for Brown Ranch

Since Brown Ranch may be the last stand for the Dakota Skipper in southeast North Dakota, management considerations are very important. Since a number of privately owned and federally "protected" sites in the area have lost their populations of Dakota Skipper, it is important that we look at the current management of the site and view it as a model. The management practices of the Brown family are clearly more successful in providing refugia for rare butterflies than those current on many other Sheyenne valley sites.

Obviously the main management practices for the site are grazing and baling prairie hay. I had the opportunity to speak briefly with Mr. Brown, while waiting for the weather to clear on 2 July. He has a good knowledge of the history of the area, and is concerned with the changes he sees around him. He is dismayed at the overgrazing and leafy spurge problems on the surrounding National Grasslands areas he shares fencelines with. He also has one neighbor who has let spurge overtake his grassland. He still treats the spurge by hand on the ranch, but doesn't know how long he'll be able to keep it in check.

He would like to see his land preserved as it is; he is proud of his prairie, and enjoys talking with scientists who come out to count his orchids and study the animals. At the same time, he is skeptical of federal or other ownership. As he considers retiring from his

ranch, he is not sure how to properly continue the stewardship which he has practiced for years.

9. Cross Ranch TNC Preserve

A follow-up visit to Cross Ranch TNC Preserve, near Hensler in Oliver County, attempted to relocate a population of Dakota Skipper discovered in 1992, but not documented during extensive surveys of the same area in 1994. Those previous surveys of Cross Ranch, from 1-5 July 1992 and 28 June to 5 July 1994, are detailed in Orwig (1994). On 9 July 1995, I resurveyed the SW1/4 of Sec. 12, T143N, R82W, from 9:10 a.m. to 12:50 p.m. The sky was 20% overcast, with winds from the S 10-20 and 64 degrees F. No new species were found for the site; neither was the Dakota or Ottoe Skipper, both of which occupied the site in 1992. As with any negative data, it is difficult to interpret the meaning of this. Certainly drought, weather fluctuations, or fire management of the site in 1993 might have eradicated the populations. Equally possible, though, is that the population had already flown or simply was overlooked in this survey. Further surveys of this section should continue to search for the Dakota and Ottoe Skippers.

Species list

8	Oarisma garita	Garita Skipper
9	Colias philodice	Common Sulphur
1	Lycaeides melissa	Melissa Blue
2	Euptoieta claudia	Variegated Fritillary
8	Speyeria callippe	Callippe Silverspot
1	Vanessa cardui	Painted Lady
5	Coenonympha inornata	Inornate Ringlet
34	Cercyonis pegala	Common Wood Nymph

Conclusion

Management issues will continue to get more complicated with the spread of leafy spurge and the great pressures put on North Dakota prairies by grazing. As more prairies in the Sheyenne are converted to irrigated potato farming, these pressures will only increase. Beyond these basic issues, there are still the complicated issues of the effects of fire management on prairie invertebrate such as rare butterflies.

Further research into these species would be helpful to answer a number of questions raised by this research. For example, what is the extent of the populations of these rare species in the mesic prairies of the Lidgerwood/Hankinson area? How many of the populations of these species are left in the Sheyenne NG and surrounding private prairie pastures?

These surveys give a good overview of a critical period in North Dakota history. Decisions made now in Bismarck and Washington will set the course for rare species like some of these butterflies. I do hope that future researchers will be able to continue studying these butterflies.

References

Brown, K. S. (1972). Maximizing daily butterfly counts. Journal of the Lepidopterists' Society 26(3): 183-196.

Dana, R. (1983). The Dakota skipper: a now rare prairie butterfly. Natural Areas Journal 3(3): 31-34.

Dana, R., and R. L. Huber (1988). Butterflies. Pages 379-395. *In* B. Coffin and L. Pfannmuller (eds.). Minnesota's endangered flora and fauna. University of Minnesota Press, Minneapolis.

Dana, R. P. (1991). Conservation management of the prairie skippers Hesperia dacotae and Hesperia ottoe: basic biology and threat of mortality during prescribed burning in spring. Minnesota Agricultural Experiment Station Bulletin 594-1991, University of Minnesota, St. Paul.

Gall, L. F. (1985). Measuring the size of Lepidopteran populations. Journal of Research on the Lepidoptera 24(2): 97-116.

McCabe, T. L. (1981). The Dakota skipper, Hesperia dacotae (Skinner): range and biology, with special reference to North Dakota. Journal of the Lepidopterists' Society 35(3): 179-193.

McCabe, T. L., and R. L. Post (1976). North Dakota butterfly calendar (including possible strays). Journal of Research on the Lepidoptera 15(2): 93-99.

McCabe, T. L., and R. L. Post (1977). Skippers (Hesperioidea) of North Dakota. Agricultural Experiment Station Publication No. 714, North Dakota State University, Fargo.

Moffat, M., and N. McPhillips (1993). Management for butterflies in the northern Great Plains: A literature review and guidebook for land managers. SD-ES-93-05. U.S. Fish and Wildlife Service, Ecological Services, Pierre, South Dakota.

Orwig, T. (1994). Report of a 1994 butterfly survey of Cross Ranch Preserve, Hensler, North Dakota. A report to The Nature Conservancy, Dakotas Field Office, Bismarck.

Pollard, E. (1977). A method for assessing changes in the abundance of butterflies. Biological Conservation (12): 115-134.

Royer, R. A. (1988). Butterflies of North Dakota: an atlas and guide. Minot State University Science Monograph No. 1, Minot.

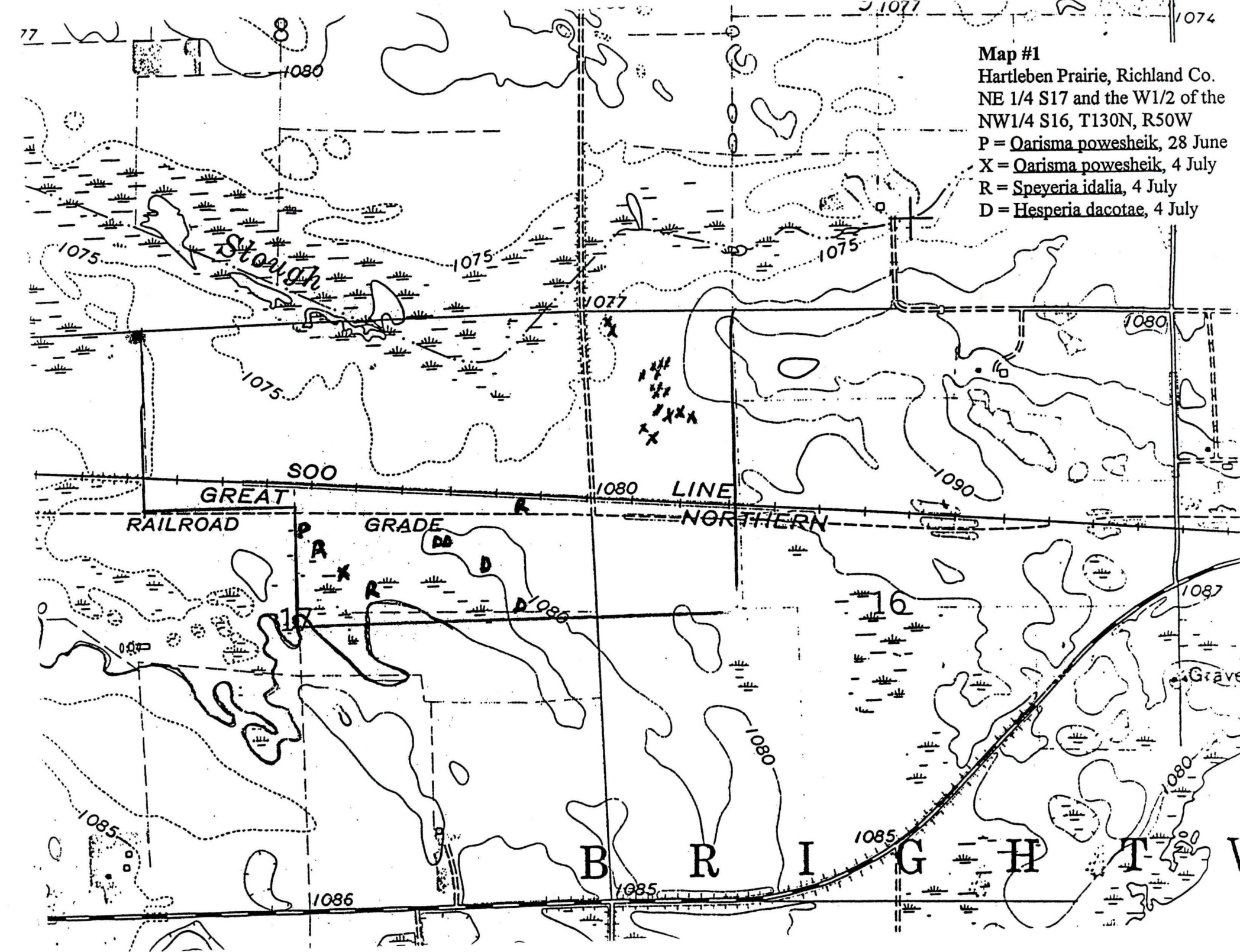
Royer, R. A., and G. M. Marrone (1992a). Conservation status of the Dakota skipper (Hesperia dacotae) in North and South Dakota. A report to the United States Department of the Interior, Fish and Wildlife Service, Denver.

Royer, R. A., and G. M. Marrone (1992b). Conservation status of the mulberry wing (Poanes massasoit) in North and South Dakota. A report to the United States Department of the Interior, Fish and Wildlife Service, Denver.

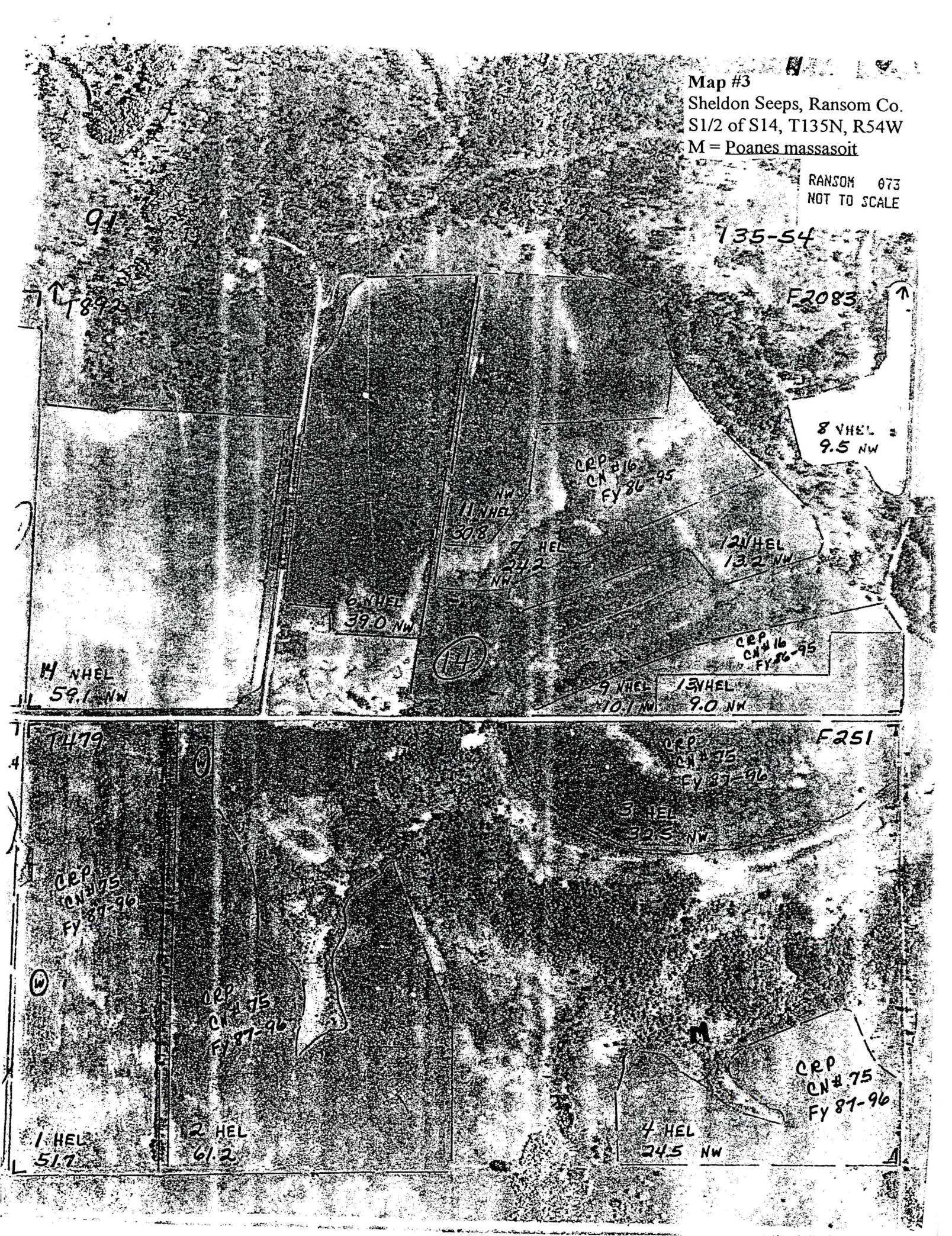
Royer, R. A., and G. M. Marrone (1992c). Conservation status of the Powesheik skipper (Oarisma powesheik) in North and South Dakota. A report to the United States Department of the Interior, Fish and Wildlife Service, Denver.

Royer, R. A., and G. M. Marrone (1992d). Conservation status of the regal fritillary (Speyeria idalia) in North and South Dakota. A report to the United States Department of the Interior, Fish and Wildlife Service, Denver.

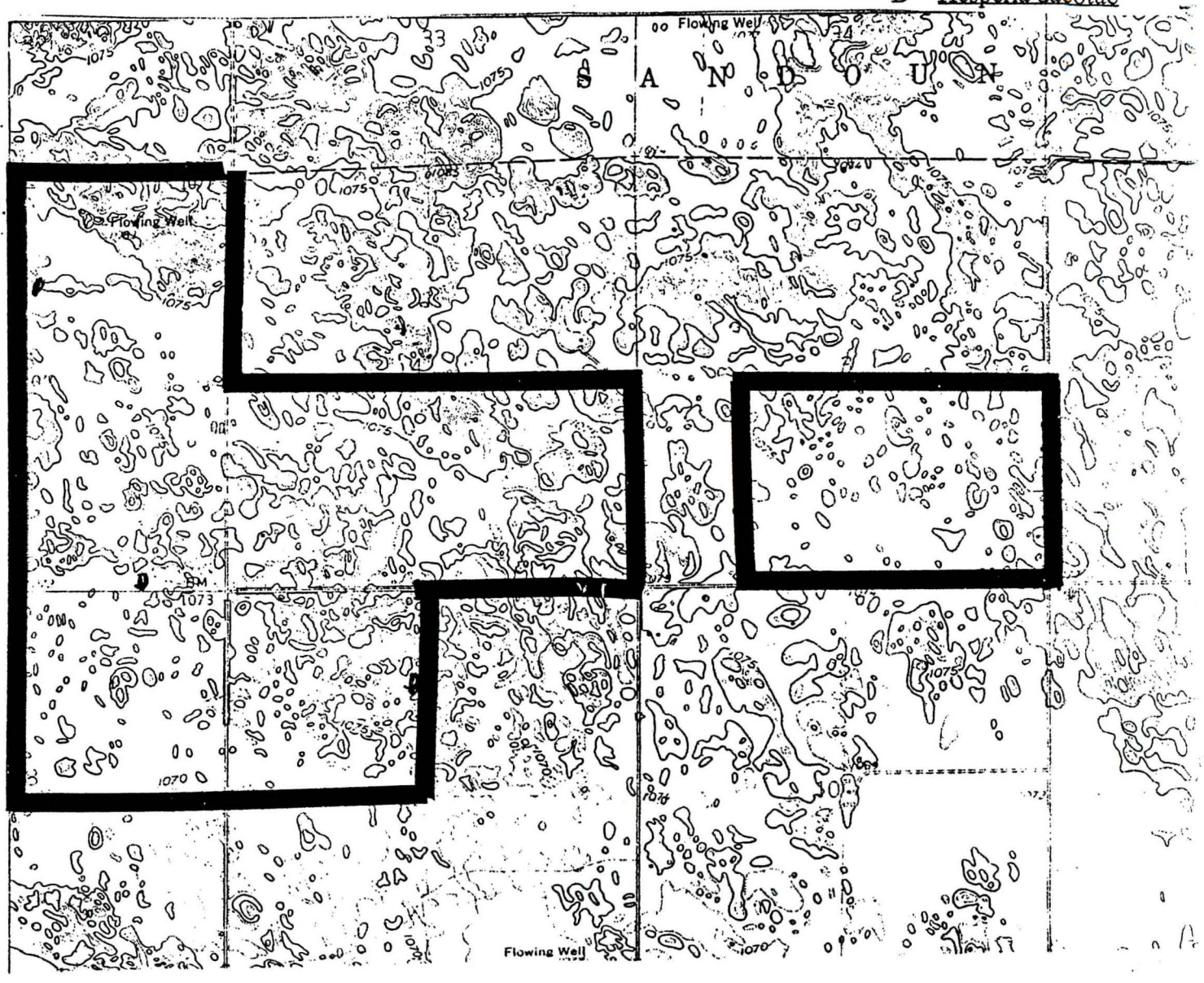
Thomas, J. A. (1983). A quick method for estimating butterfly numbers during surveys. Biological Conservation 27: 195-211.


Map #1
Hartleben Prairie, Richland Co.
NE 1/4 S17 and the W1/2 of the
NW1/4 S16, T130N, R50W
P = Oarisma powesheik, 28 June
X = Oarisma powesheik, 4 July
R = Speyeria idalia, 4 July
D = Hesperia dacotae, 4 July
Stough
SOO LINE
GREAT NORTHERN
RAILROAD GRADE
BRIGHT
1080
1075
1077
1090
1085
1086
1087
16
17
8

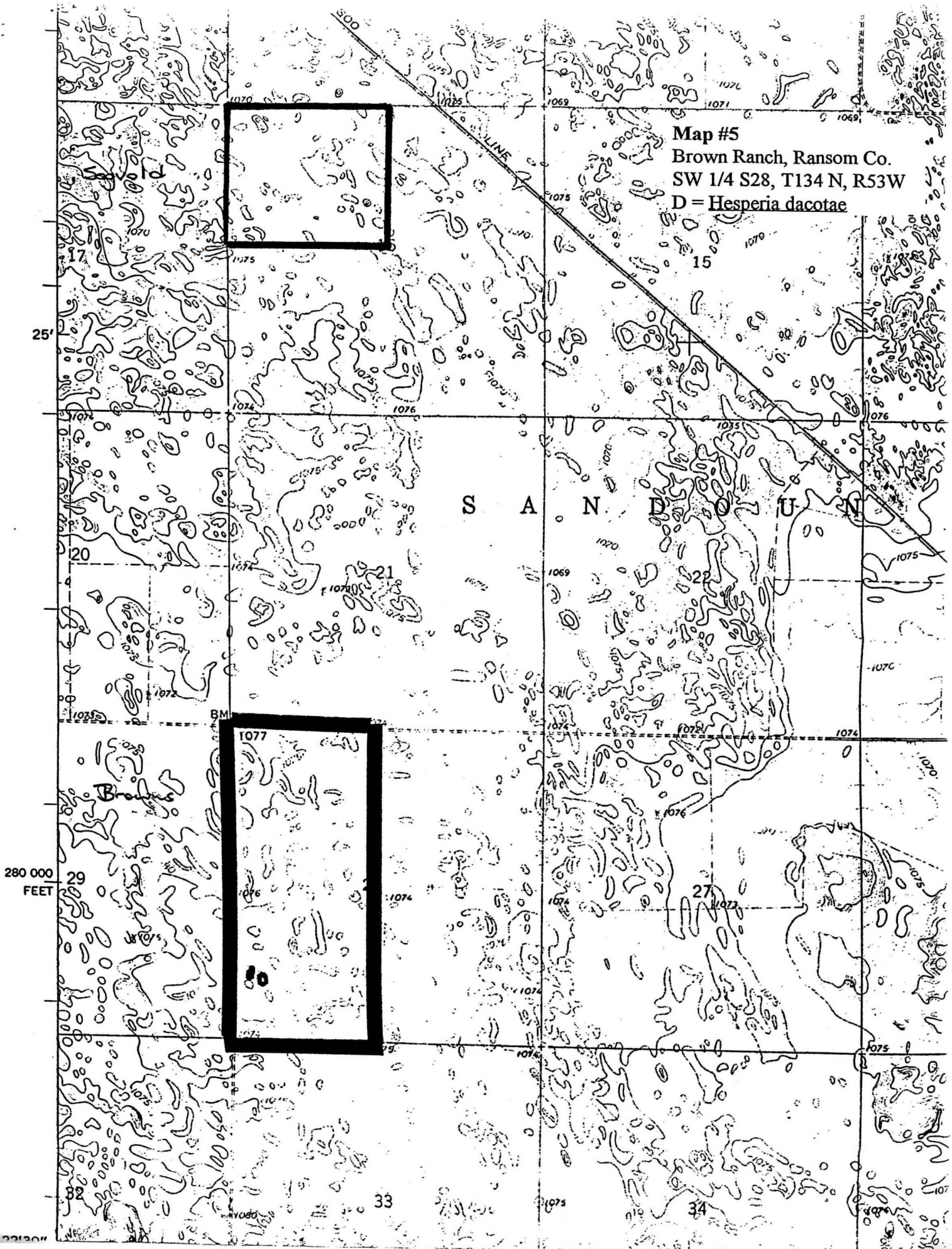

Map #2
Schultz Sand Savannah, Ransom Co.
SW1/4 S24, T134N, R54W
D = Hesperia dacotae
RANSOM 073
NOT TO SCALE
USA
24
T.101.2
F517
D
149
134-54


Map #3
Sheldon Seeps, Ransom Co.
S1/2 of S14, T135N, R54W
M = Poanes massasoit
RANSOM 073
NOT TO SCALE
91
T892
135-54
F2083
8 NHEL
9.5 NW
CRP
CN #16
FY 86-95
11 NHEL
30.8 NW
7 HEL
24.2 NW
12 NHEL
13.2 NW
6 NHEL
39.0 NW
14
CRP
CN #16
FY 86-95
14 NHEL
59.1 NW
9 NHEL
10.1 NW
13 NHEL
9.0 NW
T479
F251
CRP
CN #75
FY 87-96
3 HEL
32.5 NW
CRP
CN #75
FY 87-96
CRP
CN #75
FY 87-96
CRP
CN #75
FY 87-96
1 HEL
51.7
2 HEL
61.2
4 HEL
24.5 NW

Map #4
Brown Ranch, Ransom Co.
NW1/4 S9, E1/2 S5
T133 N, R53W
D = Hesperia dacotae



Browns


Map #5
Brown Ranch, Ransom Co.
SW 1/4 S28, T134 N, R53W
D = Hesperia dacotae
Seavold
Brown
S A N D O U N
17
15
20
21
22
29
27
32
33
34
25'
280 000
FEET
1077
BM