1998-99

SOUTH DAKOTA DEPARTMENT OF GAME, FISH AND PARKS
WILDLIFE DIVISION
SMALL GRANTS PROGRAM APPLICATION

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Date: ~~12~~ 9 February 1999

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Project Title: Solitary Ground Nesting Bees of South Dakota

PROJECT DESCRIPTION

A documentation and inventory of the solitary ground nesting bees, the families Andrenidae (andrenids), Anthophoridae (digger bees), Colletidae (yellow-faced bees), Halictidae (sweat bees), Megachilidae (leaf-cutter bees), and Melittidae (mellittids), of South Dakota. Field work will involve examination of the occurrence of andrenid, sweat, and leaf-cutter bees in natural and anthropogenic selected prairie environments within the state. Laboratory-based work will complete a database of all solitary ground nesting bees recorded from South Dakota and develop a transportable public display promoting native bees and their pollination value for use by Game, Fish & Parks personnel at the Sioux Falls Outdoor Campus, and other venues.

PROJECT NEED

Solitary ground nesting bees are mostly native species that are flower specialists, nest in the ground, and do not form social colonies directed by a primary queen. These bees are warmth-loving insects and reach their highest biodiversity in dry prairie and meadow habitats. These bees are extremely important native pollinators of native trees, shrubs, and forbs of prairies and meadows, and urban and rural gardens (Hurd et al. 1980). As such, they possess a greater pollination importance and disease resistance than non-native honeybees, and are exploitable. To date, no reasonably complete inventory or catalog is available for the species of ground nesting bees in the northern Great Plains. The most recent catalogue of Hymenoptera (bees, ants, wasps) for North America explicitly lists about 90 species from the state (Krombein 1979), but without distributional details. Meanwhile, holdings of the Severin-McDaniel Insect Collection at South Dakota State University include at least 115 species of the six families, most from the eastern and far western portions of the state.

Evidently, there is a wide discrepancy in enumerating the native species of South Dakota. More importantly, there is also a limited information base from which to judge effects of habitat change, biodiversity reduction or increase, effects of direct or latent pesticide use, loss or gain of pollination value on prairie or crop species, domestication potential, or ecological position of each species in natural and anthropogenic environments. Consequently, providers and users of state biodiversity information, such as the Heritage Program, are unable to accurately access the native bee situation. Public awareness of the ecological and agronomic importance of native bees requires improvement to help reduce biodiversity degradation.

PROJECT OBJECTIVES

This project will focus on developing a primary information base on the occurrence of ground nesting bees in South Dakota. Two primary objectives are sought: 1) conduct a preliminary field survey of species of Andrenidae, Halictidae, and Megachilidae in selected dry prairie habitats in the central and western portions of the state; 2) complete an inventory database on the bees of the families Andrenidae, Anthophoridae, Colletidae, Halictidae, Megachilidae, and

Melittidae historically recorded from South Dakota; and 3) produce a public display explaining the virtues and ecological role of native bees.

PROJECT METHODS

Fieldwork will involve the visitation, evaluation and sampling of selected sites in central and western South Dakota. We believe that eastern South Dakota records of species are adequate for this preliminary inventory. Sampling sites will include sandy and broken soil slumps, playas, and dune habitats at site that may include, but not be restricted to, the Sand Lake National Wildlife Refuge (Brown Co.), along the Missouri River and Grand River valleys (Standing Rock Reservation, Corson Co.), Slim Buttes and Antelope Range Livestock Station (Harding Co.), Mortenson Ranch (Stanley Co.), Big Bend of the Missouri River (Lower Brule Reservation, Lyman Co.), Badlands National Park (Jackson & Pennington Co's), and the Lacreek National Wildlife Refuge (Bennett Co.). Bee nesting sites will be located and assessed for expanse, species content, nest density, soil structure, plant community, and site specific factors. Bee foraging activity at flowers will be observed, with flower species and activity periods recorded. Specimens of each bee species from each recording site will be taken as vouchers. All sampling sites will be accurately determined and recorded with geographic positioning coordinates.

Database efforts will be collection augmented and conducted at the Severin-McDaniel Insect Research Collection. Construction of the database is already underway, with the preliminary entry of taxonomic information nearly complete in a commercial relational database program. Data will be transferable to other comparable programs. This information will be verified and augmented during the course of this project, through examination of specimens from other collections, published records, and professional bee specialists.

A public interpretive display on native bees and their pollination value is planned. Details on construction of this display will at least include short textual descriptions and discussions, and numerous images. Preliminary contact with the Outdoor Campus, Sioux Falls, shows a high interest for such a display. The display should be constructed such that it will be readily transportable to other venues, such as the Adams Nature Center, North Sioux City, and Discovery Center, Pierre.

EXPECTED RESULTS

Four basic areas will be addressed by results of this project. The first two expected results provide basic and immediately applicable science: 1) development of a usable database on solitary ground nesting bees; 2) an information base for evaluation of the status of native bees, with an assessment of their possible level of threat to survival. A third result will be the consolidation and generalization of information to produce a public educational display on the ecological importance, aesthetic qualities, and virtues of ground nesting bees. Finally, this project will coordinate with a complementary study on the potential of positive exploitation of certain species and their role in pollination of native prairie plants and crops. This latter aspect is the subject of a master's of science thesis by Dollar.

QUALIFICATIONS OF APPLICANTS

Paul J. Johnson is an associate professor of entomology. Academic training in entomology was done at Oregon State University (B.S.), University of Idaho (M.S.), University of Wisconsin-Madison (Ph.D.). He conducts research on insects, teaches entomology, and is curator of the Severin-McDaniel Insect Research Collection, at South Dakota State University. He is currently involved with biodiversity projects throughout the state, particularly in the Black Hills, but also nationwide and internationally. He has published nearly 50 scientific and popular articles on a range of insects and their biology.

Nicomas Dollar is an undergraduate student in her last semester of classes. By May, 1999, she will be a graduate student working towards a masters of science in entomology, at South Dakota State University. Her undergraduate degree is expected from the University of Hawaii-Hilo, in sustainable agriculture. Her graduate research will be on the value of native northern prairie bees for pollination of crops and native plants.

REFERENCES OR CITATIONS

Hurd, P.D., Jr., W.E. LaBerge, and E.G. Linsley. 1980. Principal sunflower bees of North America with emphasis on the Southwestern United States (Hymenoptera, Apoidea). Smithsonian Institution Press, Washington, D.C.

Krombein, K. (ed.) 1979. Catalog of Hymenoptera in America north of Mexico, vol. 2, Apocrita. Smithsonian Institution Press, Washington, D.C.

[illegible] $ 75

public display preparation $ 100

Other

$

$

$

$

Total $ 3435

Other Funding Sources SDSU Agricultural Experiment Station, Dept. of Plant Science

Donated Time/Expenses Johnson - salary & benefits @ 2% time ($900)

Dollar - salary & benefits @ 40% time ($4000)

Total Requested from Wildlife Division Wildlife Diversity Small Grants Program $ 3435

Administrative Use Only

Category	Eligibility Y___ N___	Project Number___
___ Research/Survey	Acceptable Y___ N___	
___ Education	Rank ___ of ___	Date Received___
___ Watchable Wildlife		
___ Habitat	Approved Y___ N___	Amount Requested___

Date	Milestones
May 1999	Project Starting Date
Sept. 1999	Completion of fieldwork
Dec. 1999	Completion of database
Mar. 2000	Completion of public display
April 2000	Final Report Submitted

BUDGET

Show how the project is expected to be funded. The amount requested from the Wildlife Division Small Grants Program is limited to $5000.00. If other funding sources are available for the project, give the amount and describe how that funding will be used. Donated time and/or expenses should be described briefly, also.

Personnel Expenses	**Wildlife Division Small Grants Program**
lodging & meals, @ $50/day	$ 1000
	$
	$
	$

Travel Expenses	
vehicle mileage, 4000 mi @ $0.24/mi	$ 960
	$
	$
	$

Supplies	
GPS receiver	$ 350
Insect Pins	$ 600 ?
vials & chemicals	$ 350

KEY	EXPLANATION
Bolded family, subfamily, tribe, genus, subgenus, or species group.	Names are Bolded when starting a new Family, Subfamily, Tribe, Genus, Subgenus, or Species Group to easily separate and identify the total number of each rank.
Species name in normal type with a preceding asterisk.	Indicate a new recording for the State of South Dakota. For example: (*Andrena *hitei* has only previously been recorded in Colorado. However, this species was found to be in our collection (Severin-McDaniel Collection at South Dakota State University), but not recorded.)
Species name in **bold** type with a preceding asterisk.	Indicate a new recording for the State of South Dakota *and* a new addition to our collection. For example: (*Hexaperdita* ***nubila** has only previously been recorded in Florida, Arkansas, and Kansas and has not been previously collected or recorded for the State of South Dakota.)
Species names in **bold** type without an asterisk.	Indicate a new addition to our collection, but have previously been recorded for our State area. For example: ***Simandrena wheeleri*** is recorded in N.S. and Maine to Alta., south to Colorado, Minnesota, Wisconsin, and N.C.

NOTES

- Global positioning coordinates (GPC) were only recorded where permission was granted to record the area. Those areas were on the Lower Brule Indian Reservation and the Mortenson Ranch just outside of the Cheyenne River Reservation. GPC were not recorded for the Cheyenne River or Standing Rock Indian Reservations, but general area is given. *The Cheyenne River Elk Range is near Eagle Butte.
- The summer of 1999 is the first time any GPC has ever been recorded for native bee collection, hence many species in our database from previously collected bees have only a general site area recorded.
- A good number of specimens in our previous collection have no general site location recorded, just that they were collected within the State.
- The majority of the previous collection was recorded in the early 1920s to 1950s.

	Family	Subfamily	Tribe	Genus	Author	Subgenus	Author	Species Group	Species	Author	Site
	Andrenidae										
1		**Andreninae**		**Andrena**	Fabricius	**Andrena**	Fabricius		*hitei	Cockerell	
2		Andreninae		Andrena	Fabricius	Andrena	Fabricius		milwaukeensis	Graenicher	
3		Andreninae		Andrena	Fabricius	Andrena	Fabricius		thaspii	Graenicher	
4		Andreninae		Andrena	Fabricius	**Callandrena**	Cockerell		*accepta	Viereck	Lower Brule R.
5		Andreninae		Andrena	Fabricius	Callandrena	Cockerell		haynesi	Vier., Ckll.	
6		Andreninae		Andrena	Fabricius	Callandrena	Cockerell		*helianthi	Robertson	
7		Andreninae		Andrena	Fabricius	Callandrena	Cockerell		helianthiformis	Vier.,Ckll.	
8		Andreninae		Andrena	Fabricius	**Cnemidandrena**	Hedicke		*hirticincta	Provancher	
9		Andreninae		Andrena	Fabricius	Cnemidandrena	Hedicke		surda	Cockerell	
10		Andreninae		Andrena	Fabricius	**Gonandrena**	Viereck		*fragilis	Smith	
11		Andreninae		Andrena	Fabricius	Gonandrena	Viereck		nigrifrons	Cresson	
12		Andreninae		Andrena	Fabricius	**Larandrena**	LaBerge		*miserabilis	Cresson	
13		Andreninae		Andrena	Fabricius	**Leucandrena**	Hedicke		placida placida	Smith	
14		Andreninae		Andrena	Fabricius	**Melandrena**	Perez		commoda	Smith	
15		Andreninae		Andrena	Fabricius	**Plastandrena**	Hedicke		*prunorum prumorum	Cockerell	
16		Andreninae		Andrena	Fabricius	**Scaphandrena**	Lanham		bruneri	Vier.,Ckll.	
17		Andreninae		Andrena	Fabricius	**Scrapteropsis**	Viereck		*imitatrix	Cresson	
18		Andreninae		Andrena	Fabricius	**Simandrena**	Perez		**wheeleri**	Graenicher	Mortenson Ranch
19		Andreninae		Andrena	Fabricius	**Taeniandrena**	Hedricke		*wilkella	Kirby	
20		Andreninae		Andrena	Fabricius	**Thysandrena**	Lanham		brevipalpis	Cockerell	
21		Andreninae		Andrena	Fabricius	Thysandrena	Lanham		*vierecki	Cockerell	
22		Andreninae		Andrena	Fabricius	**Trachandrena**	Robertson		*forbessi	Robertson	
23		Andreninae		Andrena	Fabricius	Trachandrena	Robertson		*hippotes	Robertson	
24		Andreninae		Andrena	Fabricius	Trachandrena	Robertson		*mariae	Robertson	
25		Andreninae		Andrena	Fabricius	Trachandrena	Robertson		*miranda	Smith	
26		Andreninae		Andrena	Fabricius	Trachandrena	Robertson		quintilis	Robertson	
27		Andreninae		Andrena	Fabricius	**Tylandrena**	LaBerge		*erythrogaster	Ashmead	
28		Andreninae		Andrena	Fabricius	unassigned			*occidentalis	Cockerell	
29		**Panurginae**		**Calliopsis**	Smith	**Calliopsis**	Smith		*andreniformis	Smith	Mortenson Ranch

GPS	Pollen	Floral Hosts
	unknown	
	unknown	Dogwood, Common Dewberry
	unknown	Prairie Rose, Golden Rod, Meadow Parsnip, Buffalo Clover
44-10-06N 099-36-57W (alt. 1,411 ft.)	sunflowers	Asters, Wild Sensitive Plant, Wavyleaf Thistle
	Plains sunflower	Harebell, Echinacea
	sunflowers	Asters
	Echinacea	Lead plant, False Sunflower
	unknown	Asters, Golden Rod
	unknown	Daisy Fleabane
	Dogwood	Prairie Indian Plantain, Prairie Willow
	unknown	Yarrow, Prarie Redroot, Bearded Hawkweed, Smooth Sumac
	Prairie Rose	Pussy Toes, Buckthorn, False Toadflax, Wild Strawberry, Violets
	Lupine	Prairie Dandelion
	unknown	Dogwood
	unknown	Buckthorn, Blue Toadflax, Helianthus, Prickely Pear, Beard Tongue, Prairie Buttercup Sumac, Willow, Golden Rod, Buffalo Clover
	unknown	Ground Plum
	Prairie Willow	Prairie Rose, Indigo Bush, Lead Plant, White Camus
44-43-33N 101-05-27W (alt. 1,779 ft.)	Scarlet Guara	Dogwood
	unknown	Yarrow, Lead Plant, Indigo Bush, Buffalo Clover
	unknown	
	unknown	
	Prairie Rose	Willows, Prairie Redroot, Prairie Trout Lily, Flowering Spurge, Snow-on-the-Mountain
	unknown	Marsh Marigold, Wild Hyacinth, Echinacea, Wild Strawberry
	Willow (oligolege)	False Toadflax,Pussy Toes, Fleabane, Sumac
	unknown	Yarrow, Ground Plum, Prairie Thistle, Prairie Buttercup, Meadow Parsnip
	Lead Plant	Indigo Bush, Echinacea, Daisy Fleabane, Willows
	Willow (oligolege)	Meadow Anemone, Thimbleweed, Pussy Toes, Common Dewberry, Golden Alexander
	unknown	
44-43-33N 101-05-27W (alt. 1,779 ft.)	unknown	

30	Panurginae		Calliopsis	Smith	**Calliopsima**	Shinn		*coloradensis	Cresson	
31	Panurginae		Calliopsis	Smith	**Verbanapis**	Ckll.,Atkins		nebraskensis	Crawford	
32	Panurginae		**Perdita**	Smith	**Cockerellia**	Ashmead		albipennis albipennis	Cresson	
33	Panurginae		Perdita	Smith	Cockerellia	Ashmead		*fracticincta	Timberlake	
34	Panurginae		Perdita	Smith	**Cockerellula**	Strand		opuntiae	Cockerell	Pine Ridge
35	Panurginae		Perdita	Smith	**Hexaperdita**	Timberlake		***nubila**	Timberlake	Lower Brule R.
36	Panurginae		Perdita	Smith	**Perdita**	Smith	**Halictoides**	*lenis	Timberlake	
37	Panurginae		Perdita	Smith	Perdita	Smith	**Octomaculata**	maculigera maculipennis	Graenicher	
38	Panurginae		Perdita	Smith	Perdita	Smith	Octomaculata	tridentata	Stevens	
39	Panurginae		Perdita	Smith	Perdita	Smith	**Zonalis**	*zonalis zonalis	Cresson	
40	Panurginae		**Pseudopanurgis**	Cockerell				albitarsis	Cresson	Cheyenne River R.
41	Panurginae		Pseudopanurgis	Cockerell	unassigned			***unassigned**		Mortenson Ranch
42	Panurginae		**Protandrena**	Cockerell				bancrofti	Dunning	
Anthophoridae										
1	**Anthophorinae**	**Melitomini**	**Diadasia**	Patton				unassigned		Standingt Rock R.
2	Anthophorinae	Melitomini	Diadasia	Patton				unassigned		Lower Brule R.
3	**Nomadinae**	**Anthophorini**	**Anthophora**	Latreille	**Anthophora**	Latreille		*abrupta	Say	S.D.
4	Nomadinae	Anthophorini	Anthophora	Latreille	Anthophora	Latreille		bomboides neomexicana	Cockerell	S.D.
5	Nomadinae	Anthophorini	Anthophora	Latreille	Anthophora	Latreille		occidentalis	Cresson	Mortenson Ranch
6	Nomadinae	Anthophorini	Anthophora	Latreille	Anthophora	Latreille		smithii	Cresson	Cheyenne River R.
7	Nomadinae	Anthophorini	Anthophora	Latreille	Anthophora	Latreille		walshii	Cresson	Cheyenne River R.
8	Nomadinae	**Epeolini**	**Epeolus**	Latreille				***lectoides**	Cresson	Mortenson Ranch
9	Nomadinae	Epeolini	Epeolus	Latreille				unassigned		Standingt Rock R.
10	Nomadinae	Epeolini	Epeolus	Latreille				unassigned		Lower Brule R.
11	Nomadinae	Epeolini	**Melissodes**	Latreille	**Heliophila**			unassigned		Lower Brule R.
12	Nomadinae	Epeolini	Melissodes	Latreille				unassigned		Lower Brule R.
13	Nomadinae	Epeolini	Melissodes	Latreille				unassigned		Lower Brule R.
14	Nomadinae	**Eucerini**	Melissodes	Latreille				unassigned		Lower Brule R.
15	Nomadinae	Eucerini	Melissodes	Latreille				unassigned		Lower Brule R.
16			unassigned					unassigned		S.D.
17			unassigned					unassigned		S.D.
Colletidae										
1	**Colletinae**	**Paracolletini**	**Colletes**	Latreille			**Americanus**	americanus	Cresson	

	Asters, Helianthes (oligolege)	Spiny-tooth Gumweed, Sneezeweed,Compass Plant, Rosin Weed, Prairie Dock, Cup Plant
	Legumes, Verbena	Milkweed
	unknown	Helianthus
	unknown	Coreopsis
	Prickly Pear	nests in soft sandstone of the Laramie formation
44-10-06N 099-36-57W (alt. 1,411 ft.)	unknown	June Berry, Blue Bells, Golden Rod, Daisy Fleabane, Legumes
	unknown	Clammy Groundcherry, Verbena
	willow, white sweetclover, fleabanes	
	unknown	Annual sunflower
	unknown	Fleabanes, Broom snakeweed,
Elk Range	beardstongue	
44-43-39N 101-08-25W (alt. 1,586 ft.)	unknown	Spiderwort, Bearstongue, Golden Rod, Violets, Yarrow
	unknown	milkweed, Helianthus, sunflowers
Kenel Flats	Opuntia	
44-10-06N 099-36-57W (alt. 1,411 ft.)	Mallow Family	
unknown	unknown	wide variety
unknown	unknown	
44-43-18N 101-08-34W (alt. 1,685 ft.)	milkweed *"speciosa"*	thistles, Rocky Mtn. Bee plant, Bush morning glory,
Elk Range	unknown	sage,vervain, violets, Rocky Mtn. Bee plant, thistles
Elk Range	unknown	Cardinal flower, thistle, prairie clover, wild petunia, germander, white wild indigo, maryland sennabush clover, partridge pea,
44-43-33N 101-05-27W (alt. 1,779 ft.)		cleptoparasites on Andrenids
Kenel Flats		cleptoparasites on Andrenids
44-03-03N 099-57-16W (alt. 1,666 ft.)		cleptoparasites on Andrenids
44-03-03N 099-57-16W (alt. 1,666 ft.)		Maximillian Sunflower
44-10-06N 099-36-57W (alt. 1,411 ft.)		Wavyleaf thistle
44-03-03N 099-57-16W (alt. 1,666 ft.)		found near sandy river bank
44-03-02N 099-57-16W (alt. 1,525 ft.)		Missouri Goldenrod & False Sunflower
44-03-02N 099-57-16W (alt. 1,525 ft.)		Wavyleaf thistle
	autumn composites	wide variety

Colletinae	[illegible]	[illegible]	[illegible]			Simulans	[illegible]	Patton	
Colletinae	[illegible]	[illegible]	[illegible]			Simulans	[illegible]	Cockerell	
Colletinae	[illegible]	[illegible]	[illegible]			Simulans	[illegible]	Swenk	
Colletinae	[illegible]	[illegible]	[illegible]			Robertsonii	[illegible]	Dalla Torre	
Colletinae	[illegible]	[illegible]	[illegible]			Hyalinus	[illegible]	Cockerell	
Colletinae	[illegible]	[illegible]	[illegible]			Inaequalis	[illegible]	Say	
Colletinae	[illegible]	[illegible]	[illegible]			Willistoni	[illegible]	Robertson	
Colletinae	[illegible]	[illegible]	[illegible]			Willistoni	[illegible]	Robertson	
Diphaglossinae	[illegible]	[illegible]	[illegible]	**Hylaeus**	Fabricius		[illegible]	Forster	
Diphaglossinae	[illegible]	[illegible]	[illegible]	Hylaeus	Fabricius		[illegible]	Cockerell	
Diphaglossinae	[illegible]	[illegible]	[illegible]	**Metziella**	Michener		[illegible]	Cresson	Standing Rock R.
Diphaglossinae	[illegible]	[illegible]	[illegible]	**Prosopis**	Fabricius		affinis	Smith	
Diphaglossinae	[illegible]	[illegible]	[illegible]	Prosopis	Fabricius		[illegible]	Cockerell	
Halictidae									
Dufoureinae		[illegible]	[illegible]	**Halictiodes**	Nylander		[illegible]	Cresson	
Halictinae	[illegible]	[illegible]	[illegible]				[illegible]	Smith	Lower Brule R.
Halictinae	[illegible]	[illegible]	[illegible]				[illegible]	Provancher	Lower Brule R. (Chamberlain)
Halictinae	[illegible]	[illegible]	Smith				[illegible]	Say	Lower Brule R.
Halictinae	[illegible]	[illegible]	[illegible]				[illegible]		Lower Brule R.
Halictinae	[illegible]	[illegible]	[illegible]	Paraugochloropsis	Schrottky		[illegible]	Fabricius	Lower Brule R. (Cascade Springs, Elk Point)
Halictinae	[illegible]	[illegible]	[illegible]	Paraugochloropsis	Schrottky		[illegible]	Smith	
Halictinae	[illegible]	[illegible]	[illegible]	Paraugochloropsis	Schrottky		[illegible]	Smith	Lower Brule R.
Halictinae	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]	Cresson	
Halictinae	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]	Forster	Lower Brule R.
Halictinae	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]	Cockerell	Central-West SD
Halictinae	[illegible]	[illegible]	[illegible]			Splendens	[illegible]	Lepeletier	Martin, Sand Hills
Halictinae	[illegible]	[illegible]	[illegible]			Splendens	[illegible]	Cresson	Pierre, Buffalo
Halictinae	[illegible]	[illegible]	[illegible]			Virescens	[illegible]	Fabricius	Lower Brule R.
Nomiinae	[illegible]	[illegible]	[illegible]	**Halictus**	Latreille		[illegible]	Say	
Nomiinae	[illegible]	[illegible]	[illegible]	Halictus	Latreille		[illegible]	Christ	
Nomiinae	[illegible]	[illegible]	[illegible]	Halictus	Latreille		[illegible]	Say	
Nomiinae	[illegible]	[illegible]	[illegible]	**Seladonia**	Robertson		[illegible]	Smith	
Nomiinae	[illegible]	[illegible]	[illegible]	Seladonia	Robertson		[illegible]		

		autumn composites	
		unknown	wide variety
		unknown	wide variety
		unknown	Lead plant, Wild bergamot, White & purple prairie clover,
		unknown	Aster, Rocky Mtn. Bee plant, culycup gumweed, scarlet globe mallow, silverleaf scurf pea, prairie clover, currents, golden rod
		polylectic	wide variety
		unknown	wide variety
		unknown	Buckthorn, wild bermagot, white clover, ground cherry, sumac, poison ivy
		Legumes (oligolege) esp. Melilotus	Amaranth, milkweed, composites,Willows,
		unknown	wide variety
	Kenel Flats	unknown	Longstyle sweetroot,
		unknown	wide variety
		unknown	wide variety
		Helianthus	Daisy Fleabane, Burr Marigold
	44-10-06N 099-36-57W (alt. 1,411 ft.)	polylege	ground cherry-many others
	44-10-06N 099-36-57W (alt. 1,411 ft.)	polylege	sunflowers, bush morning glory
	44-09-25N 099-35-16W (alt. 1,366 ft.)	polylege	Wavy leaf thistle, many others
	44-10-06N 099-36-57W (alt. 1,411 ft.)	polylege	Pasque Flower, many others
s, Elk Point)	44-10-06N 099-36-57W (alt. 1,411 ft.)	polylege (vervain at this local)	wide variety
	Hot Springs		
	44-10-06N 099-36-57W (alt. 1,411 ft.)	opuntia	
	Mason, Cottonwood	unknown	nest in abandoned burrows and holes
	44-09-25N 099-35-16W (alt. 1,366 ft.)	unknown	wavy leaf thistle
		unknown	
		unknown	
		unknown	
	44-03-02N 099-57-16W (alt. 1,525 ft.)	unknown	
		Missouri Golden Rod, Prairie Sunflowers	
		unknown	
		unknown	
		unknown	
			wide spread

20	Nomiinae		Nomia	Latreille	Epimonia	Ashmead	triangulifera	Vachal	
21	Nomiinae		Nomia	Latreille	Dieunomia	Cockerell	unassigned		Lower Brule R.
22	Nomiinae	Halictini	Lasioglossum	Curtis	Dialictus	Robertson	albipennis	Robertson	
23	Nomiinae	Halictini	Lasioglossum	Curtis	Dialictus	Robertson	cinctipes	Provancher	
24	Nomiinae	Halictini	Lasioglossum	Curtis	Dialictus	Robertson	cressoni	Robertson	
25	Nomiinae	Halictini	Lasioglossum	Curtis	Dialictus	Robertson	*imitatus	Smith	
26	Nomiinae	Halictini	Lasioglossum	Curtis	Dialictus	Robertson	*incompletus	Crawford	
27	Nomiinae	Halictini	Lasioglossum	Curtis	Dialictus	Robertson	*laevissimus	Smith	
28	Nomiinae	Halictini	Lasioglossum	Curtis	Dialictus	Robertson	*lazulis	Ellis	
29	Nomiinae	Halictini	Lasioglossum	Curtis	Dialictus	Robertson	*lineatulus	Crawford	
30	Nomiinae	Halictini	Lasioglossum	Curtis	Dialictus	Robertson	nymphaearum	Robertson	
31	Nomiinae	Halictini	Lasioglossum	Curtis	Dialictus	Robertson	obscurus	Robertson	
32	Nomiinae	Halictini	Lasioglossum	Curtis	Dialictus	Robertson	*perpunctatus	Ellis	
33	Nomiinae	Halictini	Lasioglossum	Curtis	Dialictus	Robertson	pictus	Crawford	
34	Nomiinae	Halictini	Lasioglossum	Curtis	Dialictus	Robertson	pilosus pilosus	Smith	
35	Nomiinae	Halictini	Lasioglossum	Curtis	Dialictus	Robertson	*pruinosus	Robertson	
36	Nomiinae	Halictini	Lasioglossum	Curtis	Dialictus	Robertson	pruinosiformis	Crawford	
37	Nomiinae	Halictini	Lasioglossum	Curtis	Dialictus	Robertson	versans	Lovell	
38	Nomiinae	Halictini	Lasioglossum	Curtis	Dialictus	Robertson	versatus	Robertson	
39	Nomiinae	Halictini	Lasioglossum	Curtis	Dialictus	Robertson	viridatus	Lovell	
40	Nomiinae	Halictini	Lasioglossum	Curtis	Dialictus	Robertson	zephyrus	Smith	
41	Nomiinae	Halictini	Lasioglossum	Curtis	Dialictus	Robertson	unassigned		Cheyenne River R.
42	Nomiinae	Halictini	Lasioglossum	Curtis	Dialictus	Robertson	unassigned		Lower Brule R.
43	Nomiinae	Halictini	Lasioglossum	Curtis	Evylaeus?	Robertson	aberrans	Crawford	
44	Nomiinae	Halictini	Lasioglossum	Curtis	Evylaeus	Robertson	foxii	Robertson	
45	Nomiinae	Halictini	Lasioglossum	Curtis	Evylaeus	Robertson	macoupinensis	Robertson	
46	Nomiinae	Halictini	Lasioglossum	Curtis	Evylaeus	Robertson	*peraltus	Cockerell	
47	Nomiinae	Halictini	Lasioglossum	Curtis	Evylaeus	Robertson	*pectoralis	Smith	Eastern S.D.
48	Nomiinae	Halictini	Lasioglossum	Curtis	Evylaeus	Robertson	unassigned		
49	Nomiinae	Halictini	Lasioglossum	Curtis			forbesii	Robertson	
50	Nomiinae	Halictini	Lasioglossum	Curtis			*coriaceum	Smith	
51	Nomiinae	Halictini	Lasioglossum				unassigned		Lower Brule R.
52	Nomiinae	Halictini	Lasioglossum				unassigned		Standing Rock R.

		unknown	Burr Marigold, Gumweed, Helianthus, Prairie Dock, Rosin weed, Cup Plant, Golden Rod
	44-03-02N 099-57-16W (alt. 1,525 ft.)		nest site on sandy river banks
		unknown	
		unknown	
		unknown	nests in rotten wood above ground
		unknown	
		unknown	
		unknown	
		unknown	
		unknown	
		unknown	
		unknown	
		unknown	
		unknown	
		unknown	
		unknown	
		unknown	
		unknown	
		unknown	
		unknown	
r R.	Elk Range	unknown	in the grass
	44-10-06N 099-36-57W (alt. 1,411 ft.)	unknown	Rocky Mt. Bee Plant (rare white)
		Primrose	
		unknown	
		unknown	
		unknown	
		unknown	
		unknown	Rocky Mt. Bee plant
		unknown	
		unknown	
	44-03-03N 099-57-16W (alt. 1,666 ft.)	unknown	purple clover
R.	Kenel Flats	unknown	prairie rose

Nomiinae	Halictini	Lasioglossum				unassigned		Standing Rock R.
Nomiinae	Halictini	Lasioglossum				unassigned		Mortenson Ranch
Nomiinae	Halictini	Lasioglossum				unassigned		Lower Brule R.
Nomiinae	Halictini	Lasioglossum				unassigned		Lower Brule R.
Nomiinae	Halictini	Lasioglossum				unassigned		Cheyenne River R.
Nomiinae	Halictini	Lasioglossum				unassigned		Lower Brule R.
Nomiinae	Halictini	**Sphecodes**	Latreille			lautipennis	Cockerell	
Megachilidae								
Megachilinae	**Anthidiini**	**Anthidium**	Fabricius	**Anthidium**	Fabricius	unassigned		
Megachilinae		**Argyropile**				parallela	Smith	State wide
Megachilinae		**Chrysosaurus**				unassigned		Cheyenne River R.
Megachilinae		**Delomegachili**				frigida frigida	Mitchell	Harney Peak, Custer, Whitewood, Hot Spr
Megachilinae		Delomegachili				melanophaea	Mitchell	Harney Peak, Custer, Lead, Provo, Englev
Megachilinae		Delomegachili				mucida	Cresson	Harney Peak, Spearfish
Megachilinae		**Eutricharaea**				rotundata	Fabricius	Brookings, Lake Preston
Megachilinae	**Megachilini**	**Heriades**	Spinola	**Neotrypetes**	Robertson	variolosa variolosa	Cesson	Statewide
Megachilinae	Megachilini	**Hoplitus**	Klug	**Alcidamea**	Cresson	*pilosifrons	Cresson	Ft. Thompson
Megachilinae	Megachilini	Hoplitus	Klug	Alcidamea	Cresson	*truncata truncata	Cresson	Cheyenne River R.
Megachilinae	Megachilini	Hoplitus	Klug	**Andronicus**	Cresson	cylindricus	Cresson	Spearfish, Custer, Harney Peak
Megachilinae	Megachilini	Hoplitus	Klug	**Monumetha**	Kirby	*albifrons albifrons	Kirby	Harney Peak
Megachilinae		**Litomegachili**				brevis brevis	Say	State wide
Megachilinae		Litomegachili				texana	Cresson	State wide
Megachilinae		**Megachili**				centuncularis	Linnaeus	Brookings, Volga, Newell, Lake Preston
Megachilinae		Megachili				inermis	Provancher	Harney Peak, brookings
Megachilinae		Megachile				montivaga	Cresson	Custer
Megachilinae		Megachili				relativa	Cresson	Harney Peak, Hot Springs, Englewood
Megachilinae		**Phaenosarus**				fortis	Cresson	Forestburg, Elk Point, Sand Hills,
Megachilinae		**Sayapis**				fidelis	Cresson	Rapid Canyon
Megachilinae		Sayapis				pugnata pugnata	Say	Rapid Canyon, Custer
Megachilinae		**Xanthosaurus**				dentitaursus	Robertson	State wide
Megachilinae		Xanthosaurus				latimanus	Say	State wide
Megachilinae		Xanthosaurus				periherta	Cockerell	Custer, Englewood, Willow Lake, Lake Pla
Megachilinae		**Xeromegachile**				integra	Cresson	Elk Point

Kenel Flats	unknown	prair.clov.,blaz.star,scar.globe mal,opunt.
44-43-189N 101-08-34W (alt. 1,685 ft.)	unknown	prairie legumes, convulvulus
44-09-25N 099-35-16W (alt. 1,366 ft.)	unknown	composites & other unidentified
44-03-02N 099-57-16W (alt. 1,525 ft.)	unknown	golden rod
Elk Range	unknown	horse mint, prairie cone flower
44-10-06N 099-36-57W (alt. 1,411 ft.)	unknown	composite
	unknown	
Elk Range	composites	

rings

wood

	provisions nest with False Indigo, sweet clover	exavates pith in dead stem of Helianthis tuberosus (Jerusalem artichoke) for nest
Elk Range	Polylectic	on log under trees in draw
	Polylectic	nests in dry pithy stems & trap-nests, visits mostly Legumes, Composites and Labia
	unknown	visits Phacelia

cid

Megachilinae Xeromegachile mucorosa Cockerell Spearfish