THE HAT CREEK PROJECT, BRITISH COLUMBIA


The Royal British Columbia Museum has launched a major research project at a field station that is now established at the Hat Creek Ranch in the interior of British Columbia. The research area includes extensive grasslands and is centred on the Hat Creek valley, but includes terrain from the Thompson River valley on the east to the Fraser River Canyon on the west. It extends from the confluence of the Fraser and Thompson Rivers to the south to approximately a line from Dog Creek to 100 Mile House on the north.

The main general aims of the overall project, are: 1) To inventory the biota of the Hat Creek Valley and adjacent area; 2) To carry out research projects to document ecological diversity and biotic and biophysical interrelationships in the Hat Creek area; and 3) To carry out biosystematic research that contributes to the understanding of taxonomic-evolutionary relationships.

The project, which will last five years, will consist of two major parts. The first part, which is expected to take two years, will be mainly concerned with completing an inventory of plant and animal diversity: this is to establish a baseline for specific research projects into taxonomic and ecological relationships. The second part involving problem-oriented research projects in the last three years will focus on i) the study of taxonomic groups that are either poorly known or have a high likelihood of providing significant insight into biological processes; and ii) the study of relationships within taxa groups or between-among groups that will provide significant insight into the structure, function and diversity of ecosystems in the area.

To clarify and understand modern taxonomic and ecological relationships, the environmental history of the area will be studied and described through pollen and plant macrofossil analysis. This history will provide a basis to interpret plant and animal distribution, and origin and evolution of ecosystems and ecological relationships in the project area.

Research on the grasslands will be a major entomological focus. The plan will be to compare the Hat Creek fauna with that of the Riske Creek and Osoyoos areas. However, since the area offers a wide range of habitats in several biogeoclimatic zones, the effects of elevation on distribution and occurrence can also be studied.

Although the project is largely that of the Royal British Columbia Museum, which will provide most of the budget, other participation is welcome. Those interested should contact me at the Museum.
Investigations of the leafhopper fauna of eastern grasslands have now progressed to the point where a preliminary report seems due.

Sampling has been done throughout southern Ontario, Michigan and northern New York state. I have contacted various individuals and institutions in Ontario and Michigan in an effort to discover as many native grassland sites as possible. Notable contributions were received from Paul Catling (BRC), Dan Brunton (Ottawa), and John Morton (University of Waterloo). Sites in Michigan investigated included those listed in Public Prairies of Michigan by K.A. Chapman and R.J. Pleznac (private, 1982), available from the Michiana Prairie Society, P.O. Box 667, Kalamazoo MI 49005. All but 6 of the 64 sites with potentially interesting records were sampled by me in the last 3 years. The sites are shown on map 1, and detailed maps are given for some of the more obscure sites.

Approximately 100 grassland leafhopper species are known from western Canada, and 27 of these are now known from Ontario. In addition, 8 southern species find their northern limits in grasslands of Ontario or Michigan rather than on the Canadian prairies. Other records from these grasslands are 3 leafhopper species apparently endemic to northeastern USA and adjacent Canada, and 3 each of Cercopidae and Caliscelidae with similarly interesting distributions. These have been compared to Homoptera sampled from serpentine barren grassland sites in Maryland (Soldiers' Delight) and Pennsylvania (Goat Hill F.R.).

*Paraphlepsius turpiculus* (Ball) and *Limotettix bisoni* Knell, common prairie species that occur in Ontario have been omitted from the list as they are also common on *Juncus* in bogs in northern Michigan. *Limotettix parallellus* Van Duzez has been collected from a bog at Puslinch, Ont. and likewise may not be exclusively a grassland species.

*Athysanella longicauda* Beirne has been collected at various sites along the Ottawa River and from the university arboretum in Madison, Wisconsin. It is also found in grassland sites near Lake Ontario and Lake Michigan and appears to be an eastern endemic. *Prosapia ignipectus* (Fitch) occurs on little bluestem (*Andropogon scoparius*) stands in the New England states and also in isolated localities around Lake Huron. *Philaenarcyss killa* Hamilton, formerly thought to be a Great Lakes endemic, is now known to be a common prairie species throughout southern Michigan southwest to Oklahoma.

List of grassland leafhoppers and spittlebugs

Endemic:

Cercopidae - *Prosapia ignipectus* (Fitch)

Cicadellidae - *Athysanella longicauda* Beirne, *Notus* and *Psammotettix* n. spp.

Southern species:

Caliscelidae - *Brachomorpha pallidipes* Stål

9. Ipperwash Beach, Ont. South of Lampman Drive (Map 6) an area of
undisturbed sand ridges among woods with big bluestem (Andropogon Gerardi),
little bluestem, switch grass (Panicum virgatum) and Calamovilfa longifolia.
A rich mixture of northern and western species occur here, including 4 prairie
species known in Canada only from this site: Fitchiella robertsoni, Flexamia
prairiana from big bluestem, Philaenarcs killa from little bluestem and
nymphs of an unidentified Negiosiana sp. Other prairie species: Flexamia
delongi and Paraphlepsius lobatus from little bluestem, also Balclutha
neglecta, Limotettix paralleles, Paraphlepsius umbrosus and Texanamus
arctostaphylae; southern species: Bruchomorpha dorsata and Chlorotettix
spatulatus; endemic species: Prosapia ignicryptus from little bluestem.

10. Pinery Provincial Park, Grand Bend, Ont. Similar to Ipperwash, but
with extensive oak woods. Prairie species: Paraphlepsius lobatus; southern
species: Chlorotettix spatulatus.

11. Sauble Beach North, Ont. Open sand dunes with switchgrass cover
interspersed with sand cherry (Prunus pumila) and heartleaf willow (Salix
cordata); bearberry (Arctostaphylos uva-ursi), Juncus and grasses in low area
behind dunes sampled. Prairie species: Aceratagallla sicciolius,
Laevicelphalus unicoloratus, Laevicelphalus sp. (unidentified female new to
Canadian fauna) and Paraphlepsius umbrosus.

12. Ojibphant, Ont. Small sand ridge with little bluestem cover in cedar
woods on N side of road providing access to N end of beach. Southern
species: Chlorotettix spatulatus.

13. Red Bay, 2 km SE Howdenvale, Ont. on SW corner of junction of Huron
Rd. with access road to Petrel Point. Sandy area overgrown with "pure" stand
of little bluestem and Juniperus horizontalis in cedar wood. Prairie
species: Flexamia delongi; southern species: Chlorotettix spatulatus.

14. St. Jean Point Nature Preserve, 1 km N Howdenvale, Ont. Coastal
heath mainly overgrown with little bluestem, bearberry and horizontal
juniper. Prairie species: Flexamia delongi, Texanamus arctostaphylae and
Texanamus marmor, the last on Juniperus horizontalis.

15. Pike Bay, Ont. Sand-overridden sphagnum fen at bottom of bay with
little bluestem growing amongst sedges, cottongrass and shrubby plants.
Prairie species: Flexamia delongi and Paraphlepsius lobatus; southern
species: Chlorotettix spatulatus.

16. Prairie Point, 3 km S Cape Croker, Ont. Grassy flats on north side
of isthmus. Prairie species: Aceratagallla sicciolius.

17. Stokes Bay, Ont. Stony ground with mixed forbs and grasses at neds
of road on either side of bay; S side dominated by little bluestem, N side
with switch grass. Prairie species: Flexamia delongi and Paraphlepsius
lobatus.

18. Pleasant Harbour, 7 km SW Miller Lake, Ont. Sandy beachfront covered
with little bluestem and horizontal juniper. Prairie species: Flexamia
delongi.

19. 1 km E Pine Tree Harbour (Map 7), 4 km WSW Miller Lake, Ont.
Extensive alvar amongst larch and cedar clumps; flora similar to 14. Prairie
species: Flexamia delongi and Paraphlepsius lobatus.

20. 7 km NE Miller Lake, Ont. Small alvar with large horizontal juniper
patches and low bunchgrasses in birch-cedar woods. Prairie species:
Aceratagallla sicciolius, Limotettix paralleles and Texanamus marmor.

21. Cabot Head, 20 km NE Miller Lake, Ont. Natural meadow at edge of
cedar wood near shore, mainly Poa? with switch grass clumps. This is the only
Canadian site for the prairie species Graminella mahri, on switch grass. The
nearest U.S. record is no. 47. Other prairie species: Texanamus
arctostaphylae; also found in eastern Canada at 14 and SE Manitoulin I
(understory site).
Prairie species:  
Aphelopoma rosa Metcalf, Bruchomorpha nocosa Stal  
Philanarcys killa Hamilton, Leptronia gibbosa Ball  
Aceratagalla sicciifolius (Uhrer), Aflexia rubranura  
(DeLong), Auridius n. sp., Balcutha neglecta (DeLong & Davidson),  
Commelius sexvittatus (Van Duzee), Dorydiella kansana Beamer, Flexamia  
delonig Ross & Cooley, Flexamia inflata (Osborn & Ball), Flexamia  
praeliana DeLong, Graminella mohri DeLong, Laevicephalus minimus  
(Osborn & Ball), Laevicephalus unicoloratus (Gillette & Baker),  
Laevicephalus sp., Limotettix paraleius (Van Duzee), Limotettix n.  
sp., Macropsis quadriv melanchata Breakey, Mociellus americanus Emelianov,  
Negosiana sp., Neocoelidia tumifrons (Gillette & Baker),  
Paraphlepsius lobatus (Osborn), Paraphlepsius umbrosus (Sanders &  
DeLong), Polyamia caperata (Ball), Polyamia compacta (Osborn & Ball),  
Psammotettix knuillae Greene, Texanatus marmor (Sanders & DeLong),  
Texanatus arctostaphyli (Ball), Xerophloea peltata (Uhrer).  

Known sites  

1. Picnic site, 5 km E Madawaska, Ont. Low sandhills overgrown with  
aspen; ridges with grasses and mixed forbs. This site is the easternmost  
record for Neocoelidia tumidifrons, which has also been collected at the  
Wainfleet bog near Welland, Ont. The Madawaska site is one of 3 eastern  
sites for an undescribed species of Auridius otherwise known only from the aspen  
parkland of Alberta.  

2. Ramsay alvar (Map 2), 3 km N Almonte, Ont. on Ramsay Concession Road  
12 NW of Highway 44. Mostly Poa compressa and Panicum philadelphicum, but  
with extensive patches of Sporobolus heterolepis and S. vaginiflorus; a  
central lower area with tall, mixed grasses and Juncus dudleyi supports  
Dorycara platyrhyncha (Osborn). This is the only site north of Illinois for  
Laevicephalus peronatus. Prairie species: Texanatus arctostaphyli; endemic  
species: Athysanella longicauda from Sporobolus vaginiflorus. A similar  
alvar 7 km SW Arnprior, Ont. (Cut Bank alvar) is smaller and has no  
interesting leafhopper species.  

3. 2 km NW Harrisville, N.Y. Low sandhills overgrown with pine. Prairie  
species: Aceratagalla sicciifolius.  

4. 5 km E Camden East (Map 3), Ont. Similar to Ramsay alvar, but with  
different grasses and rushes in seep area near road. Prairie species:  
Acerataggalla sicciifolius, and Flexamia inflata from Juncus dudleyi.  

5. Point Anne (Map 4), 4 km E Belleville, Ont. Mainly Poa compressa and  
Panicum philadelphicum among red cedar thickets, but near marshy area mixed  
with side-oats grama, Bouteloua curtipendula and Eleocharis elliptica. This  
is the only site north of Ohio for Laevicephalus minimus, a side-oats  
specialist. Other prairie species: Aceratagalla sicciifolius, Balclothia  
nelecta and Flexamia inflata from Eleocharis elliptica.  

6. 5 km E Lake Dalrymple (Map 5), Ont. Extensive, lightly grazed alvar,  
mostly Poa compressa and wire grass, Danthonia spicata with patches of Panicum  
philadelphicum; mixed grasses and sedges in wet, unfenced area 3.3 km E of  
Lake Dalrymple Road on unnamed road beyond end of pavement probably best  
collecting area. This site needs re-investigation.  

7. 3 km E Sunnidale Corners, Ont. Poa and little bluestem along  
highway. Prairie species: Laevicephalus unicoloratus from little bluestem.  

8. Squaw Point, 4 km W Leith, Ont. Small alvar along highway; sample  
taken on eastern side, which is now destroyed for housing lots; formerly a  
little bluestem meadow with Eleocharis elliptica and other sedges in seep  
area. Prairie species: Dorydiella kansana and Limotettix paraleius from  
sedges.
22. Johnston Harbour, 17 km SE Tobermory, Ont. Coastal heath similar to 14, but less open. Prairie species: *Flexamia elongi*, *Paraphlepis lobatus* and *Texan anus marmor*.

23. Borden Road, 15 km SE Tobermory, Ont. Similar to 22. Prairie species: *Flexamia elongi* and *Paraphlepis lobatus*.

24. 14 km SE Tobermory, Ont. Small alvar on south side of main highway with fine grasses among horizontal juniper clumps. Prairie species: *Texan anus marmor*.

25. Deros Bay Conservation Area, 8 km SE Tobermory, Ont. Sphagnum bog behind sandbar; little bluestem and other grasses together with horizontal juniper near woods. This is the only Canadian site for the prairie species *Polyamia compacta*. Other prairie species: *Flexamia elongi*, *Paraphlepis lobatus* and *Texan anus marmor*.

26. 1 km N Baptiste Harbour, 5 km S Tobermory, Ont. *Deschampsia caespitosa* growing in muddy rill in small alvar where other native grasses and horizontal juniper occupy the higher ground. Prairie species: *Texan anus marmor*.

27. Cape Hurd, 6 km SW Tobermory, Ont. Coastal heath similar to 22, but with *Salix candida* clumps. Prairie species: *Flexamia elongi*.

28. South Bay, 19 km SW Wikwemikong (Map 8), Ont. Small alvar 2 km NE of fork in road; rocky areas covered with *Eleocharis elliptica* - *Po a compressa* mixture, separated by *Sporobolus heterolepis* growing in cracks. This is the most northeasterly record of *Bac luthia neglecta*. Other prairie species: *A flexia rubranura* on *Sporobolus heterolepis* (otherwise known only from 5 localities: southern Manitoba, eastern South Dakota, Chicago Illinois and the next 2 sites) and *Limotettix paralelalus*.

29. Goat I, 1 km E Little Current, Ont. Relict prairie growing on south-facing slope S of highway. Prairie species: *Acerata gallia sicci folius*, *A flexia rubranura*, *Bac luthia neglecta*, *Flexamia elongi*, *La evcephalus unicoloratus*, *Mocu ellus americanus*, *Paraphlepis lobatus* and *Texan anus arctostaphy lae*.

30. Great La Cloche I Nature Preserve, 5 km E Little Current, Ont. near gate. Low alvar along south shore with extensive beds of *Eleocharis elliptica* and *Deschampsia caespitosa* between small raised areas crowned with prairie grasses and cedar clumps. This is the most northerly record for the gulf-coast *Hec alius grandis*; the next closest record is Chicago. Other prairie species: *A flexia rubranura*, *Flexamia elongi*, *La evcephalus unicoloratus*, *Mocu ellus americanus* and *Neoecelidia tumidifrons*.

31. 7 km NE Evansville, Ont. Oak savannah along Hwy. 540; grazed under-story mostly *Po a compressa* with large horizontal juniper patches. This is the only site on Manitoulin I where *Texan anus marmor* was found. Other prairie species: *Aacerata gallia sicci folius*.

32. Misery Point (Map 9), 10 km SE Silver Water, Ont. This alvar has not been investigated for Homoptera, as the access road is very rough.

33. Burnt I, 9 km SW Silver Water, Ont. Coastal heath as 14. Prairie species: *Flexamia elongi* and *Paraphlepis lobatus*.

34. Suicide Point, Vidal Bay, 10 km E Meldrum Bay, Ont. This alvar, dominated by *Sporobolus heterolepis*, has not been investigated for Homoptera since the only access is by water.

35. S of Mississagi Lighthouse, 12 km W Meldrum Bay, Ont. Rocky shore with extensive growth of horizontal juniper and mixed grasses including little bluestem. This is the most northerly site for *Graminella nigrifrons* (Forbes), a pest species that enters Canada in southernmost Ontario. Prairie species: *Flexamia elongi*.

36. Maxton Plains, 10 km NE Drummond, Drummond I, Mich. Alvar similar to 28, but with little bluestem meadow bordered by sphagnum bog to S, and with sand cherry, *Potentilla*, horizontal juniper and other shrubs towards aspen
grove at W end. Extensive beds of Sporobolus heterolepis completely dry in July. This is the only site for an undescribed species of Notus (a transarctic genus) and one of 2 sites for an undescribed species of Psmotettilx (the other is 40). Prairie species: Aceratagallia siccifolius, Aurilinus n. sp., Flexamia delongi, Limotettilx peraleius, Paraphlepsius lobatus and Texanamus arcostaphyale.


38. 0.5 km N junction of old Hwy. 2 (which is a power line cut E of that point) and Cut River Road (Map 10), 5 km E Epoufette Bay, Mich. Sandy clearing in forest dominated by wire grass and Deschampsia flexulosa, with extensive patches of bearberry, horizontal juniper, Carex ?pensylvanica and Poa pratensis growing with Agropyron. This is the northeasternmost locality for Commelina sessilis; the closest site is no. 48. Other prairie species: Aceratagallia siccifolius, Aurilinus n. sp. on Poa pratensis, Balclutha neglecta and Texanamus arcostaphyale.


40. Grand Sable Lake, 5 km W Grand Marais, Mich. High dunes with sparse cover of dune grass (Ammophila) interspersed with little bluestem, Artemisia and other forbs on S-facing slopes; mixed grasses, horizontal juniper and many forbs in low places. This is the second locality for the new Psmotettilx sp. of no. 36; a sample from sand dunes in Carcross, Yukon Territories represents a similar or possibly the same species.

41. 10 km N Huron Beach, Mich. Low dunes with dune grass, willows and sand cherry cover; open areas behind dunes as in 37. Prairie species: Macropsis quadrimaculata on sand cherry.

42. 4 km W of junction of Hwy. 23 and county road 638 (Map 11), 11 km W Presque Isle, Mich. Alvar near power line cut, with big and little bluestem, Poa compressa and other grasses; seep areas with Eleocharis elliptica and other rushes. This is the northernmost site for Dorydiella kansana, Limotettilx n. sp., Polyamia capreta and Prosapia ignitexta; the Limotettilx on Eleocharis elliptica is also known from Missouri, Oklahoma and coastal Texas. Prairie species: Flexamia delongi, Laevicephalus unicoloratus, Limotettilx peraleius, Paraphlepsius lobatus and Texanamus arcostaphyale.

43. 5 km N Presque Isle, Mich. near Lighthouse Point. Sandspit overgrown with dune grass, sand cherry and willows. Low areas behind dunes with rushes, big and little bluestem and switch grass. The northernmost record for Philaenarcys killa, here on big and little bluestem; other prairie species: Flexamia delongi, Macropsis quadrimaculata, Paraphlepsius lobatus and Texanamus arcostaphyale.


45. 1 km N Clear Lake State Park, 17 km N Atlanta, Mich. Heath with scattered jack pines; ground cover of reindeer moss with wire grass, little bluestem, blueberry, sweet fern and sand cherry. Prairie species: Bruchomorpha dorsata and Macropsis quadrimaculata.

47. 14 km S Empire, Mich. Natural clearing in oak-pine woods; ground cover mostly Carex pensylvanica and introduced grasses, with tall clumps of switch grass. Prairie species: Graminella mohri on switch grass.

48. Honor, Mich. South-facing slope of high dunes with patch of Leptoloma comatum interspersed with some Aristida, mostly Poa compressa and Agropyron in surrounding areas. Prairie species: Commelina sextilatus, Philipnarcys killa and Psammotettix knuillae. The last of these has also been taken near Moosonee on the shores of James Bay.

49. 5 km W Fife Lake, Mich. Sand hills with pine cover; open areas mostly little bluestem and bracken with patches of Panicum. Prairie species: Laevicephalus unicoloratus.

50. Sippy Flats, 0.6 km E Hwy. 37 on County B-96, 2 km S Lilley, Mich. Open pine scrub - heath with weedy undergrowth of wire grass, bracken, sweet fern, oswego tea and many other forbs. Prairie species: Bruchomorpha jocosa.

51. 1 km W Idlewild, Mich. Sandy clearing at edge of oak woods; isolated clumps of big and little bluestem, Carex pensylvanica, sweet fern and forbs. Prairie species: Aceratagallia sicciifolius, Bruchomorpha dorsata, Flexamia delongii, Laevicephalus unicoloratus, Philipnarcys killa.

52. 4 km W Oxbow, Mich. Natural prairie in sparse pine woodland dominated by Carex pensylvanica, Koeleria macrantha and Panicum. This and the next site are the northernmost records of Bruchomorpha pallidipes, previously known as far north as Maryland, and the easternmost records of Auridius helvus, previously known from Alberta to Wyoming. Other prairie species: Aceratagallia sicciifolius, Balclutha neglecta, Bruchomorpha dorsata, Bruchomorpha jocosa, Flexamia delongii, Laevicephalus unicoloratus, Philipnarcys killa.

53. 9 km ESE Newaygo, Mich. Regenerating prairie amidst pine plantations; mostly Carex pensylvanica with little bluestem, Koeleria macrantha and Panicum. This is 1 of 3 sites east of Chicago where Lepyronta gibbosa occurs; here it feeds on Lesepeza sp. Other specimens are from just W of Boston, Massachusetts (1890s specimens in the USNM collection). Other prairie species: Aceratagallia sicciifolius, Auridius helvus, Bruchomorpha jocosa, Flexamia delongii, Laevicephalus unicoloratus, Philipnarcys killa. Southern species: Bruchomorpha pallidipes.


56. 3 km N Harbor Beach, Mich. Muddy shore edged with rushes; landwards with rank grasses amongst Polygonum thickets. Southern species: Graminella pallidula.

57. Ojibway Prairie Provincial Nature Reserve, Windsor, Ont. Tallgrass prairie along Titcombe Road, S of road with extensive Spartina beds and many forbs, N of road dry prairie dominated by big and little bluestem with switch grass. This is the northernmost site for Chlorotettix fallax and Hecalus flavidus, and the northeastermost site for Xerophloeoa peltata. Other prairie species: Aphelopoma rosa, Balclutha neglecta, Dorydiella floridana, Flexamia pratitana and Laevicephalus unicoloratus; other southern species: Balclutha abdominalis, Chlorotettix spatulatus, Graminella pallidula and Graminella oquaka.

59. Walpole Island, Ont., 2.5 km N of main road on second road E of St. Clair River. Tallgrass prairie without bluestem grasses. Prairie species: Aphelonema rosa; southern species: Balclutha abdominalis and Graminella oquaka. The endemic species Prospia ignipectus was taken in an adjacent wooded site.


61. Port Bruce, Ont. A sandy site with switchgrass. Southern species: Graminella pallidula.


63. Presque Isle, N of Erie, Pa. This sandbar site with its many grass and rush species was studied in 1923 by DeLong (Ann. ent. Soc. Am. 16:363-373) who reported the following southern species: Chlorotettix spatulatus, Dorydiella floridana, Graminella moehri (type locality) and Graminella pallidula. The second of these, here feeding on Scleria verticillata, probably actually represents the prairie species, D. kansana which has been taken at no. 57 and Blenheim in southern Ontario. The site deserves reinvestigation.

64. Queenston, Ont. This site is not known to me, but is probably a sandy coastal site with switchgrass. Southern species: Graminella pallidula.
GRASS DOMINATED ASSOCIATIONS NORTH OF 60°


The largest arctic "grassland"
I have seen yet,
Was wet.

No "grasslands" in the prairie understanding of the term, occur north of 60°. There are large sedge or willow dominated green areas and "barren grounds" where any grass is difficult to find, but there are also small zones, where grass species form the dominant vegetation. These are relatively limited and isolated.

**Wet grass zones:**

(a) **Tidal salt meadows.** A species of goose grass (*Puccinellia phryganodes*) forms salt meadows, anywhere along the shorelines of the Arctic coasts where there is a gently sloping muddy bank inundated by the sea at high tide. Particularly large meadows occur on parts of the tidal mud flats of Frobisher Bay, especially near river deltas.

(b) **Freshwater Arctophila meadows** are abundant in the Mackenzie River delta where this species often forms a monoculture in water 25-75 cm deep. The zones are conspicuous from the air because of their lime green colour in the spring and summer and their pale reddish brown colour after the grass flowers.

(c) **Drained lake basin meadows.** Around Tuktoyaktuk, N.W.T., Ross Mackay, UBC, has mapped many drained lake basins, and even created one. In these sites grasses are one of the first species to colonize the newly exposed soil. Separate drained lake beds dominated by monocultures or near monocultures of four different grasses have been observed (*Arctagrostis, Arctophila, Dupontia*, and *Puccinellia borealis*).

**Upland sites:**

(a) **Rough fescue grass zones in the western arctic.** Northern rough fescue *Restuca altaica*, is closely related to the dominant species of the fescue prairies of British Columbia and the southern Prairie Provinces. It occurs commonly in a stabilized zone between the tree or shrub line and the steeper less stable slopes. It is also associated with willows on gravel bars.

(b) **Eroding slopes and frost boils where very few species grow.** In the northern and eastern Arctic usually such sites have 2 or 3 species of fescue (*Festuca baffinensis, F. brachyphylla* and *F. glauca*). In the Yukon, unstable and poorly vegetated scree slopes in the Richardson Mountains have a fescue steppe dominated by the same species (*F. lenensis*) found in a fescue steppe association described from the Eastern U.S.S.R.

(c) **Dumps and towns.** Grasses are common in the disturbed lands associated with human habitation. The dumps of Iguluit are grass dominated and 16 species have been found in and around the town.

(d) **Foxtail (Alopecurus) "dominated" areas,** on the high arctic islands are "grasslands" of muskoxen even though there is sometimes less than 5% vegetation coverage.
NEW PARK PROTECTS GRASSLANDS


The Canadian Parks System, already the world's second largest, is expanding to include approximately 900 square km of Saskatchewan grassland. Grasslands National Park, one of the few remaining prairie wilderness areas in North America, will include some varieties of flora and fauna not found in any other national parks.

The park will be located in southern Saskatchewan between Val Marie and Kildeer, in two blocks along the U.S. border. The land is to be acquired on a willing-seller, willing-buyer basis, with landowners in the area free to continue ranching, sell their land to other ranchers or sell to the Canadian Parks System. Many farmers have already indicated their willingness to sell to the parks system.

A recent agreement signed between the federal government and the province of Saskatchewan has accelerated plans for Grasslands National Park. The agreement, which is based on a 1981 federal-provincial accord, includes the designation of over one-third of the park area as a mineral reserve, a status that protects the area from oil and gas exploration. Exploration activities will be permitted in the rest of the park. Saskatchewan will retain control over major waterways flowing through the park.

For more information, contact: Ian Rutherford, Canadian Parks Service, Environment Canada, Ottawa, Ontario K1A 0H3, (819) 994-2657.

ACTION PLAN FOR PRAIRIE CONSERVATION


Many Canadians are concerned about global environmental issues such as destruction of the Amazon rain forests, yet few realize that one of the world’s most endangered ecosystems is found within our own borders.

Before heavy agricultural settlement changed the prairie landscape into one of vast wheat fields interrupted by occasional grain elevators and farm houses, the area was covered with grass and scrub and sustained hundreds of animal species. Today, at least 99 percent of tall-grass prairie, 90 percent of fescue (pasture-like) grassland and 75 percent of mixed prairie and aspen parkland have disappeared. It is estimated that one-third of Canada’s endangered bird and animal species make the Prairies their home.

The few patches of native prairie that remain are now the focus of a World Wildlife Fund conservation effort. Drafted by a steering committee representing various groups and conservation organizations from the provinces of Alberta, Manitoba and Saskatchewan, the Prairie Conservation Action Plan calls for a concerted effort by all parties to conserve the biological diversity of the Canadian Prairies. Its key recommendation include:

- identifying the remaining parkland and prairie;
- developing a system of protected lands and connecting corridors;
- preparing recovery plans for rare, threatened, vulnerable and endangered species;
- implementing habitat restoration and management plans; and
- encouraging balanced land use on private lands.

To demonstrate its support and ensure that the goals for the plan are met, the government of Alberta will establish a Prairie Conservation Coordinating Committee composed of representatives of various provincial government departments and non-government organizations. The province will also contribute a total of $300,000 over the next three years to "Prairie for Tomorrow" - a program which will address those goals of the Prairie Conservation Action Plan that relate to the
management of Alberta's endangered species. Funds will go towards increasing public awareness, preparing wildlife recovery plans and initiating cooperative projects with landowners and organizations. The province's contribution will be matched by the World Wildlife Fund, and administration costs for the program will be assumed by Inter-City Gas Corporation.

In Manitoba, the plan is one component of a broader land and water strategy for the province which stresses the importance of conservation as a tool for economic development. The government of that province will sponsor conservation projects, implement an endangered species law and encourage prairie farmers to practise agriculture in a manner which sustains the integrity of the environment. One recent initiative has been the purchase of 32.4 ha (80 acres) of tall-grass prairie habitat outside Winnipeg.

One of the first concrete initiatives to come out of the plan in Saskatchewan is the creation of a fund for endangered species. The provincial government and the World Wildlife Fund are sharing the cost of a $300,000 five-year program that will prepare recovery plans for endangered species and protect endangered wildlife habitats. In addition, significant headway has been made towards the establishment of a grasslands park area in the province. A review of existing agricultural policies and programs is also planned.

English-only copies of the 38-page Prairie Conservation Action Plan may be obtained by sending $6 (make cheques payable to World Wildlife Fund) to Mike Quinn, Prairie for Tomorrow, c/o Department of Forest Sciences, 855 General Services Building, University of Alberta, Edmonton, AB T6G 2H1, (403) 432-4413.

For further information: in Alberta, contact Mike Quinn at the above address; in Saskatchewan, contact Dale Hjertaas, Wildlife Branch, Saskatchewan Department of Parks, Recreation and Culture, 3211 Albert St., Regina, SK S4S 5W6, (306) 787-2892; in Manitoba, contact Robert Sopuck, Policy Management Secretariat, Manitoba Legislature, Room 14, 450 Broadway, Winnipeg, MN R3C 0V8, (204) 945-0721.

TALL-GRASS PRAIRIE CONSERVATION PROJECT

The Final Report of the Manitoba Prairie Conservation Project was published in April 1989, by the Manitoba Naturalists Society. Authored by JoAnne Joyce, the Prairie Program Co-ordinator, this report has 30 pages with five appendices.

Executive Summary (reproduced with permission)

"Tall-grass prairie is the most endangered plant and animal community in Canada today. Only a fraction of 1% of the tall-grass Red River settlers knew as "prairie" remains in Manitoba - a province whose tall-grass prairies mark the northernmost extent of the community in North America and historically comprised the most extensive area of tall-grass prairie in Canada. Manitoba's first systematic inventory of this community was initiated in 1987 by the Manitoba Naturalists Society. The goals of the Tall-Grass Prairie Conservation Project were to locate all relicts in the area of Manitoba historically dominated by tall-grass prairie, to take steps to protect and manage them, and to educate landowners, resource managers and the general public on the values of this ancient community and on ways to appreciate, manage and protect it. To date the Project has surveyed 90% of its 600,000 ha targeted area, locating 22 relict prairies (102 ha in total). An additional 166,000 ha have been surveyed in areas of wooded grassland peripheral to the historic range. 66 prairies comprising 1906 ha were found in these transitional areas, most in the southeastern part of the province near Tolstoi, Manitoba. To date 700 landowners have been contacted by project staff; management plans, including recommendations on proper grazing and prescribed burning regimes, have been prepared for 5 of the sites.

Because most of the province's tall-grass prairie was destroyed before it was ever documented, maintenance of even the smallest remnant prairie is of high value for its potential economic benefits, for research and education, as habitat, and for the public good. The
implementation of programs and policies that promote native prairie conservation in Manitoba is therefore of paramount importance. At present there is no mechanism, public or private, specific to the conservation and management of native prairies in the province. Private landowner stewardship, management assistance, Crown land management, native prairie tax credits and the integration of prairie maintenance into agricultural soil and water conservation initiatives are facets of prairie conservation which should be implemented in Manitoba immediately. These programs need support wherever possible by public education and new or amended legislation. The Tall-Grass Prairie Conservation Project recommends that a number of steps be taken towards conserving and managing Manitoba's part of a valuable national and international resource (please see Project Recommendations). In an effort to effect this, the Project has taken an active part in the formulation and implementation of World Wildlife Fund's Prairie Conservation Action Plan and in the Province of Manitoba's Prairie Conservation Strategy."

The report concludes:

"Manitoba's prairie habitat has been seriously depleted. If the remaining tracts of prairie do not receive protection soon, we will cease to be a "prairie province". The preservation of our remaining prairie habitat should be pursued because:

- it represents an irretrievable part of our natural heritage, and
- it is a virtually untapped resource.

Lasting economic benefits can accrue if we examine and use our native prairies wisely. Elsewhere in North America the economic potential of prairie plants and their genetic resources are already being exploited. If Manitoba is to keep pace we must act soon to preserve this facet of our natural resources."

For further details, contact JoAnne Joyce, Prairie Program Co-ordinator, Tall-Grass Prairie Conservation Project, Box 24, 1495 St. James St., Winnipeg, MN R3H 0W9, (204) 945-2395.

LITERATURE OF NOTE


This publication records that before agricultural settlement, Canada's prairie grassland occupied an area of about $500 \times 10^3 \text{ km}^3$. About two thirds of this land is now under crops. The change in land use has significantly altered the balance between evaporation and transpiration and has increased groundwater recharge.