

NOTEWORTHY INSECTS OF JACK PINE
IN MANITOBA AND SASKATCHEWAN

by

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INTRODUCTION

Jack pine (*Pinus banksiana* Lamb.) is the most widely distributed pine species in Canada extending from Nova Scotia and New Brunswick across Quebec, Ontario, and the Prairie Provinces to northern British Columbia and the Mackenzie River Valley in the Northwest Territories (Cayford et al. 1967). It is widely distributed in the Manitoba-Saskatchewan Region except in the southern grasslands and in the northern tundra transition areas. Although jack pine often grows in pure, even-aged stands, it is found in mixture with other species such as trembling aspen (*Populus tremuloides* Michx.), white birch (*Betula papyrifera* Marsh.), white spruce (*Picea glauca* (Moench) Voss), balsam fir (*Abies balsamea* (L.) Mill.), and red pine (*Pinus resinosa* Ait.).

Publications similar to this one have been made for spruce in Canada (Brown 1941) and trembling aspen in northwestern Ontario (Smereka and Rose 1963). The 'Forest Lepidoptera of Canada' was compiled by R.M. Prentice and B.M. McGugan from 1958 to 1963. An attempt will be made to formulate the same type of report for all hosts in the Manitoba-Saskatchewan Region, eventually incorporating all the information into a final volume. This would provide an up-to-date list of all insects known to occur within this Region and could be revised periodically as new species are uncovered.

For more than thirty years, field personnel of the Forest Insect and Disease Survey have sampled this coniferous host to assess the populations present and to determine the impact of various insect species. This compilation of insects on jack pine presents available data from 1948 to 1965. During this period, approximately 7,505 insect samples were collected from this host by field personnel and submitted to Winnipeg headquarters for identification.

METHODS

Field personnel of the Forest Insect Survey utilized six basic collection types. These can be summarized as follows:

1. Beating--are collections obtained by beating or shaking insects from trees or branches. Usually five trees are sampled when this method is employed.
2. Hand picked--are collections taken from foliage, tree or ground surfaces by other means than beating. The number of trees sampled by this method can vary but is usually less than five.
3. Ground--are samples actually taken from the duff or soil layers. Migrating caterpillars, etc. taken while on the ground or on low vegetation were not considered to be true ground samples and were recorded as hand picked.
4. Bark or wood--are samples taken from these parts of a tree.
5. Frass--are samples of larval excrement.
6. Traps--are samples of insects taken by means of light or bait traps.

Each collection type was then further subdivided into two main categories. These were 'quantitative' and 'qualitative'. This was done in order to distinguish samples which had some quantitative significance when compared to the routine survey collection. Only collections taken according to some prescribed method were classed 'quantitative'. The routine survey collection was therefore classified as being 'qualitative'. The majority of collections were taken by beating and hand-picked methods. Those taken from bark or wood constituted a much lower percentage. The remaining three collection types, ground, frass, and traps are relatively unimportant when a specific host is under consideration.

Insect samples, collected in the field, were forwarded to headquarters for identification. In order to facilitate identification, numerous immature stages were reared to the adult form. Those species, not identifiable at headquarters, were forwarded to specialists in Ottawa for further identification.

All Survey data, including that on jack pine, was recorded on punch cards. Insect samples collected from jack pine (1948-1965) were summarized in code form by the Data Processing Centre in Ottawa and Univac in Winnipeg. An Insect Code Manual was then utilized to decode the print-out and the results were then incorporated into a table.

The scientific names, the total number of collections, the number of collections of each stage, and the time periods during which the collections were made are included in the table. The collection periods have been summarized for each family by establishing the earliest and latest dates at which the various genera were collected. The number of collections of each stage have been summarized under egg, nymph, and adult or egg, larva, pupa, and adult depending upon the biological characteristics of the order. Another category listed as "U" indicates that the stage was perhaps unknown or that a damage sample without actual specimens was submitted. The important orders have been separated by a double line and each family by a single line. The known distribution of the most important insects has also been plotted; these maps follow the discussion in this report.

All of the scientific names were checked and corrected where necessary by officers of the Entomological Research Institute in Ottawa. The results are illustrated in the following table forms.

DISCUSSION

The results indicate a wide range of insects to be present on jack pine. Twenty families, 36 genera, and 46 species are represented in five orders (Diptera, Lepidoptera, Hymenoptera, Coleoptera and Homoptera). The insects included were those which were considered to be of some economic importance or were capable of causing significant damage on jack pine. In other instances, the insect was included in the compilation, if jack pine was its primary or secondary host whether it was capable of causing serious damage or not. This latter case is particularly true for some of the solitary foliage feeders.

INSECTS OF JACK PINE (1948-1965)

Orders	Families	Genera	Species	Total no. of collec- tions	No. of collections of each stage					Periods of collections			
					E	L	P	A	U	Eggs	Larvae	Pupae	Adults
Coleoptera	Buprestidae	Chalcophora	virginiensis Drury	12				12					28/5-27/7
			dentipes Germ.	2			2						25/6-26/8
			Melanophila	1			1						16/8
				15				15				28/5-26/8	
Cerambycidae	Monochamus	scutellatus Say.		32	14		18			19/5-25/8			9/6-10/8
			titillator F.	2			2						25/7-25/8
				34	14	20	20		19/5-25/8				9/6-25/8
Curculionidae	Magdalis	gentilis Lec.		31			31						25/5-2/8
			strobi Peck.	295	6	50	239		7/6-26/7				25/5-20/9 20/5-23/9
				326	6	81	239		7/6-26/7				25/5-20/9 20/5-23/9
Scolytidae	Ips	pini Say.		64	17	3	57	5		15/6-28/9	14/7-27/9	15/5-28/9	10/7-30/8
			reeksi Vock.	20									18/5-19/10
Diptera	Cecidomyiidae	Cecidomyia	reeksi Vock.	20				20					

INSECTS OF JACK PINE (1948-1965) (cont'd.)

Orders	Families	Genera	Species	Total no. of collec- tions	No. of collections of each stage						Periods of collections						
					E	L	P	A	U	Eggs	Larvae	Pupae	Adults	U			
															Nymphs		
Homoptera	Aphididae	Cinara	banksiana P. and T.	20					20						31/5-11/7		
			pergandei (Wilson)	5					5							5/6-1/9	
			canatra H. and B.	14						14							24/5-12/9
				39							39						24/5-12/9
Cercopidae	Aphrophora		parallela (Say.)	26	2			25							9/7-13/7	11/7-2/9	
			permutata Uhl.	28	8			20							14/6-20/7	11/7-24/9	
			saratogenesis (Fitch)	8				8								18/7-21/8	
			signoreti Fitch	26				26								5/7-30/8	
				88	10			79					14/6-20/7	5/7-24/9			
Coccidae	Phenacaspis	Toumeyella	pinifoliae (Fitch)	91				91							6/5-6/9		
			numismaticum Petitt and McD.	351				351								7/5-22/10	
				442				442							6/5-22/10		

INSECTS OF JACK PINE (1948-1965) (cont'd.)

Orders	Families	Genera	Species	Total no. of collec- tions	No. of collections of each stage					Periods of collections						
					E	L	P	A	U	Eggs	Larvae	Pupae	Adults	U		
Lepidoptera	Geometridae	Anacamptodes	vellivolata (Hlst.)	76								12/7-11/9				
		Caripeta	angustiorata (Wlk.)	80			1						24/7-17/9			
		Eufidonia	notataria (Wlk.)	145			1						4/7-17/9	1/8		
		Eupithecia	palpata Pack.	30									21/6-7/9			
		Protoboarmia	porcelaria indicataria (Wlk.)	155									11/5-30/9			
		Semiothisa	bicolorata (Fabr.)	372			8						7/7-2/10	2/9-24/9		
			858	857	9	1						11/5-2/10	1/8-24/9			
	Lymantriidae	Parorgyia	plagiata (Wlk.)	70			4						14/5-12/8	24/6-8/8		
	Lycaenidae	Incisalia	niphon clarki Free.	136			8	3					6/6-11/8	13/7-10/8	9/6-11/7	
	Olethreutidae	Eucosma	gloriola Heinr.	39			2		25				8/7-16/8	23/7-24/7	7/7-17/9	
		Petrova	albicapitana Busck.	945			20	5	107				5/4-15/10	5/4-7/9	9/6-20/7	15/5-22/8
				984			22	5	132				5/4-15/10	5/4-7/9	9/6-20/7	15/5-17/9

INSECTS OF JACK PINE (1948-1965) (cont'd.)

Orders	Families	Genera	Species	Total no. of collec- tions	No. of collections of each stage					Periods of collections				
					E	L	P	A	U	Eggs	Larvae	Pupae	Adults	U
Lepidoptera	Noctuidae	Anomgyna	elimata (Gn.)	136	135		1				3/5-25/9		4/6	
		Panthea	furcilla (Pack.)	56	52	4					21/7-23/9	18/8-27/8		
		Zale	duplicata largera (Sm.)	250	248	1	2				5/6-13/8	6/8	24/7-3/8	
				442	435	5	3				3/5-25/9	6/8-27/8	4/6-3/8	
	Pyralidae	Tetralopha	robustella (Zell.)	160	146	1		14			6/7-5/10	15/9		12/8-29/10
	Sphingidae	Lapara	bombycoides Wlk.	77	77						7/7-27/9			
	Tortricidae	Amorbia	humerosana (Clem.)	79	79						15/7-14/9			
		Argyrotoenia	tabulana Free.	54	43	3		10			3/7-16/9	21/6-24/8		14/7-21/9
		Choristoneura	pinus pinus Free.	1189	1003	454	86	9		23/6	19/5-10/9	17/6-28/9	3/7-11/8	19/5-14/8
		Sparganothis	tristriata Kft.	64	57	5	2				14/6-31/8	28/6-6/7	11/7-12/8	
				1386	1182	462	88	19		23/6	19/5-16/9	17/6-28/9	3/7-12/8	19/5-21/9
	Yponomeutidae	Zelleria	haimbachi Busck.	64	59	5					3/6-15/7	3/7-13/7		

The most important insects from an economic standpoint are as follows: Choristoneura pinus pinus, Toumeyella numismaticum, Petrova albicapitana, Pissodes strobi, Eucosma gloriola and Phenacaspis pinifoliae. The Neodiprions have not been noted in infestations proportions on jack pine in this Region and although spittle bugs have caused serious damage in the Lake States, this has not been verified here. The bupristids, cerambycids and scolytids usually prefer pine which is in a weakened condition, recently cut or been burned over.

INCIDENTAL INSECTS

In addition to those previously mentioned, numerous other insect species were collected from jack pine which are not specific to this host. Many of these were obviously 'perching' records only. There were, however, a number of species collected which are worthy of mention.

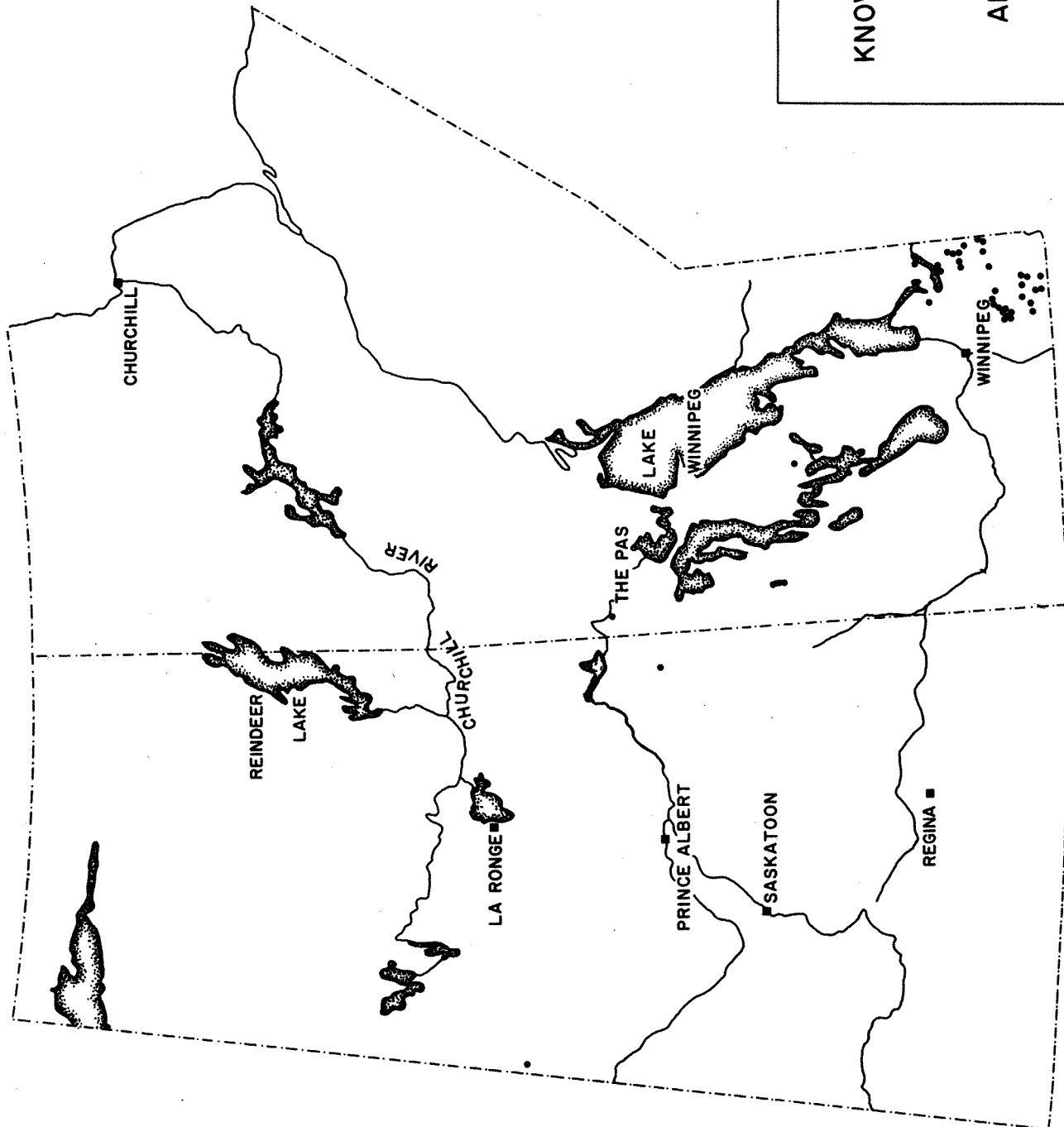
The abundance of one insect species may be related to that of the other or influenced by it. A total of 12 species of coccinellids were collected from jack pine. The abundance of Hyperaspis binotata or Coccinella transversoguttata richardsoni on an individual branch is directly proportional to populations of its prey, Toumeyella numismaticum (pine tortoise scale). Two further groups of insects present in considerable numbers are the elaterids or click beetles and the lampyrids or fireflies. The larvae of these two families are predaceous and possibly play a minor role as a predator and population regulator of some of the insects on jack pine. This is substantiated by Bradley and Hinks (1968) who observed that mirids, spiders, coccinellids, syrphids, chrysopids and elaterids were predators of aphids. In fact, it is suggested that mirids play an important part in checking the spread of aphid populations and that aphids cannot survive for a long period of time after the ants have been removed. Additional aphid species occurring on pine and not collected by the Survey are as follows: Cinara piniradicis Brad., Cinara ontarioensis Brad., Cinara gracilis (Wilson), and Cinara cronartiae Tissot and Pepper.

The "periods of collections" are based upon the time of the year when departmental surveys are carried out. Collections for some stages are also possible earlier or later than indicated, particularly for the overwintering stages. In the table, the number of collections of each stage when added together do not always equal the "total number of collections". If a sample contained a larval and pupal stage, it was considered to be a larval collection and a pupal collection. The "total number of collection" is actually equal to the number of samples collected from jack pine.

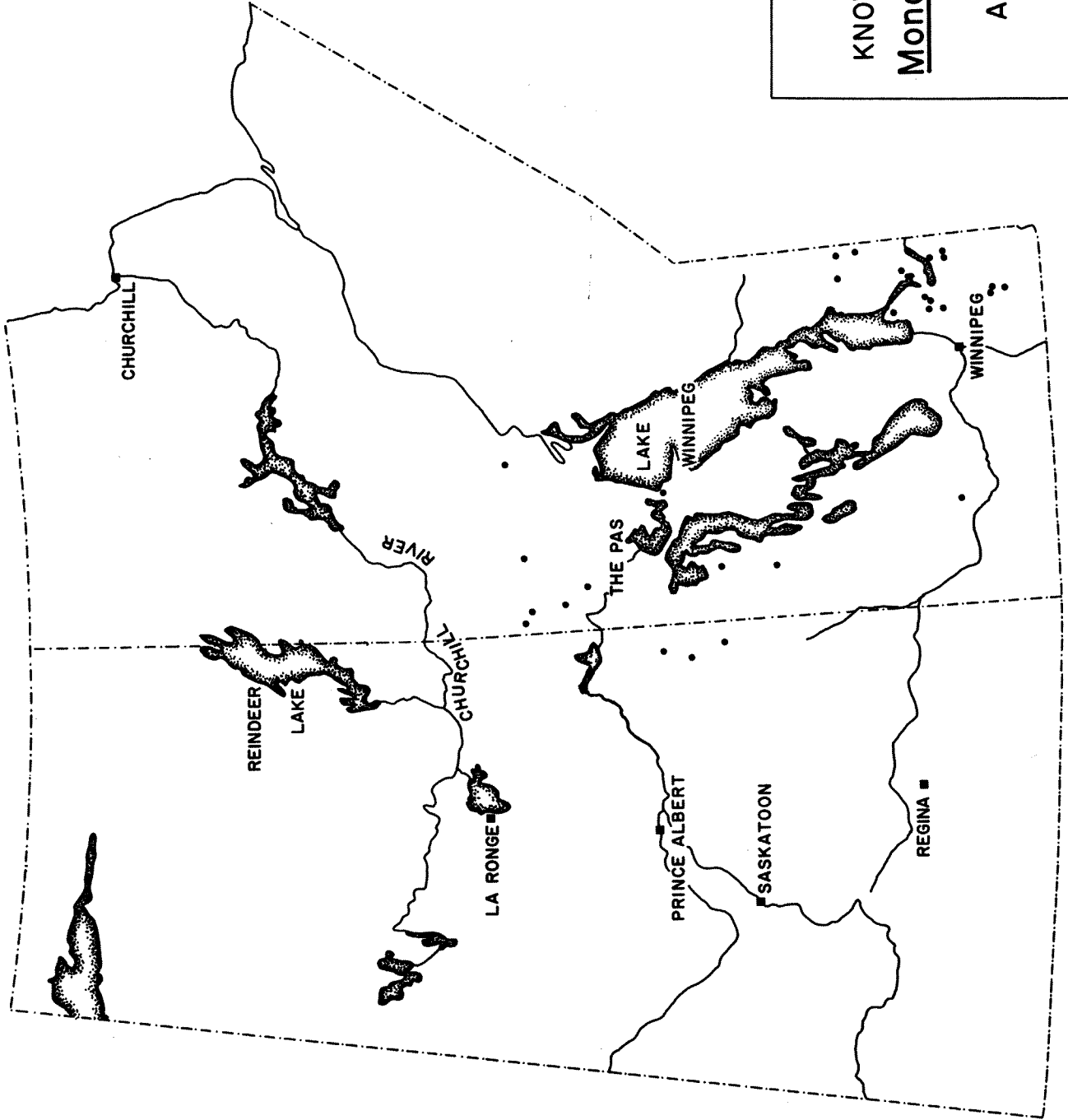
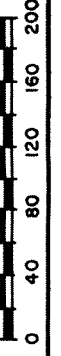
The distribution maps indicate the most insects that follow the range of jack pine in Manitoba and Saskatchewan. The following have not been recorded in central or northern Saskatchewan: Neodiprion swainei, Phenacaspis pinifoliae, Eucosma gloriola and Tetralopha robustella. The reason for this is unknown, but climate could possibly be a limiting factor.

KNOWN DISTRIBUTION OF NOTEWORTHY
INSECTS ON JACK PINE IN
MANITOBA AND SASKATCHEWAN

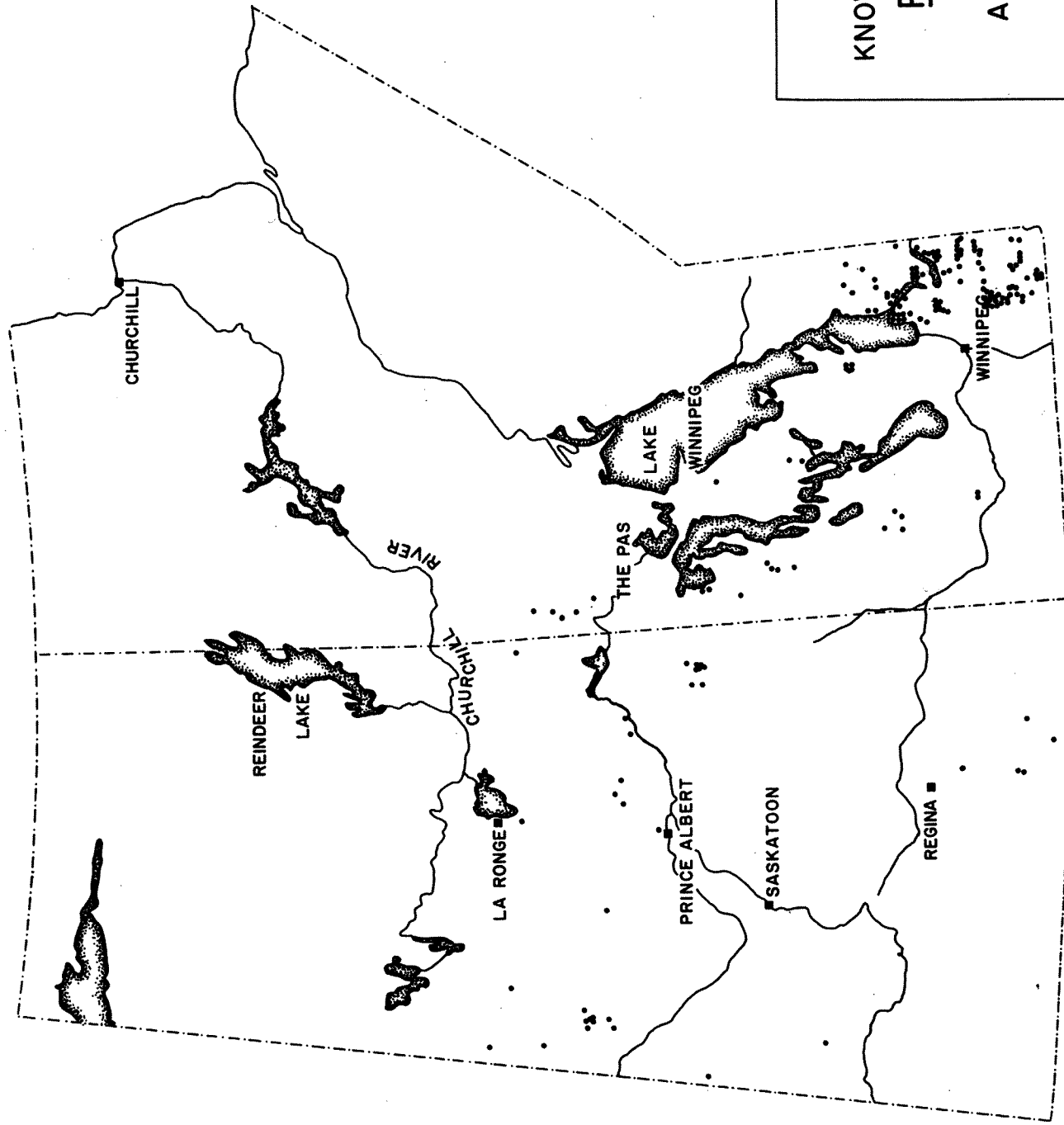
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IN MANITOBA
AND SASKATCHEWAN



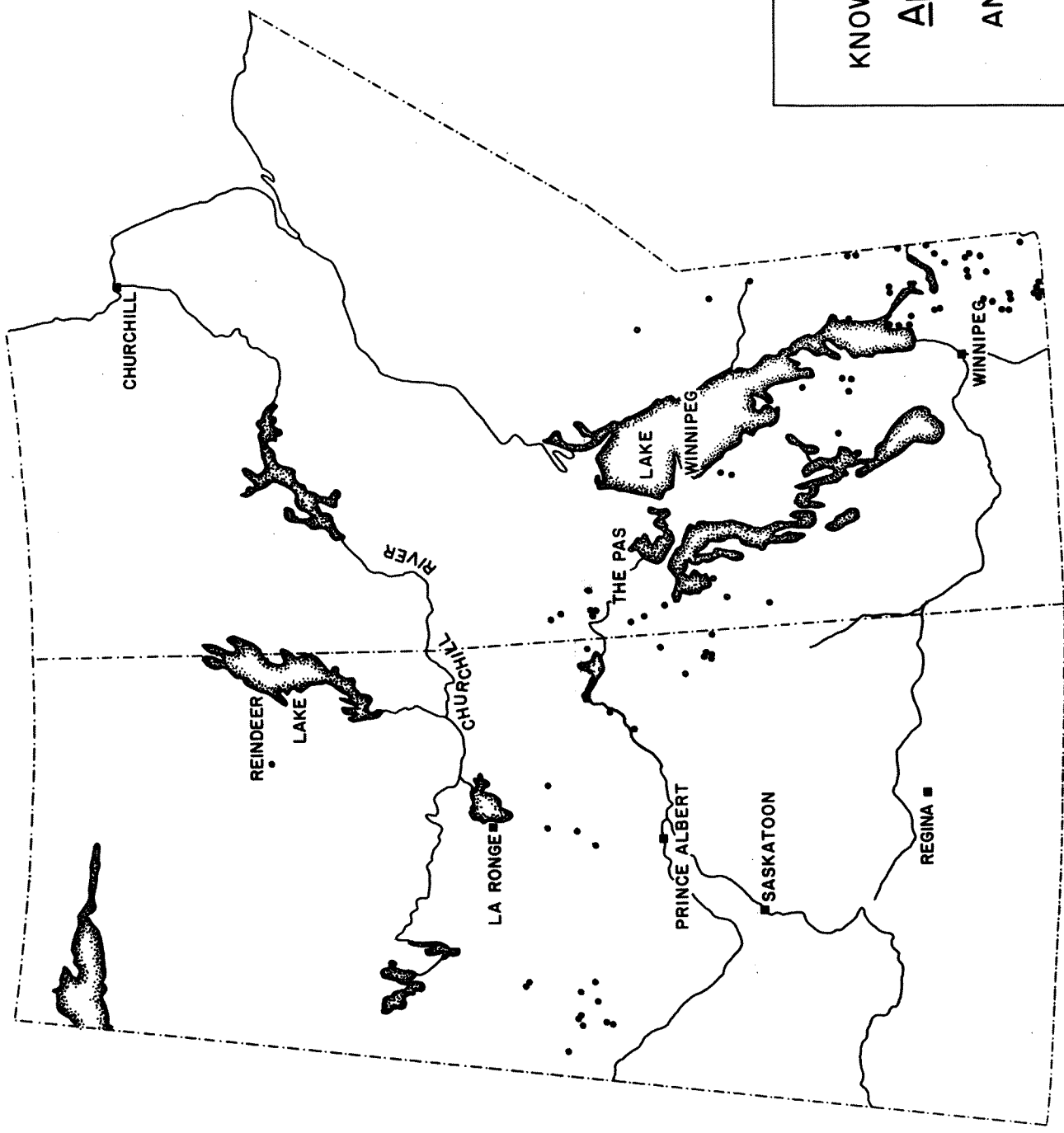
KNOWN DISTRIBUTION OF
Monochamus scutellatus
IN MANITOBA
AND SASKATCHEWAN



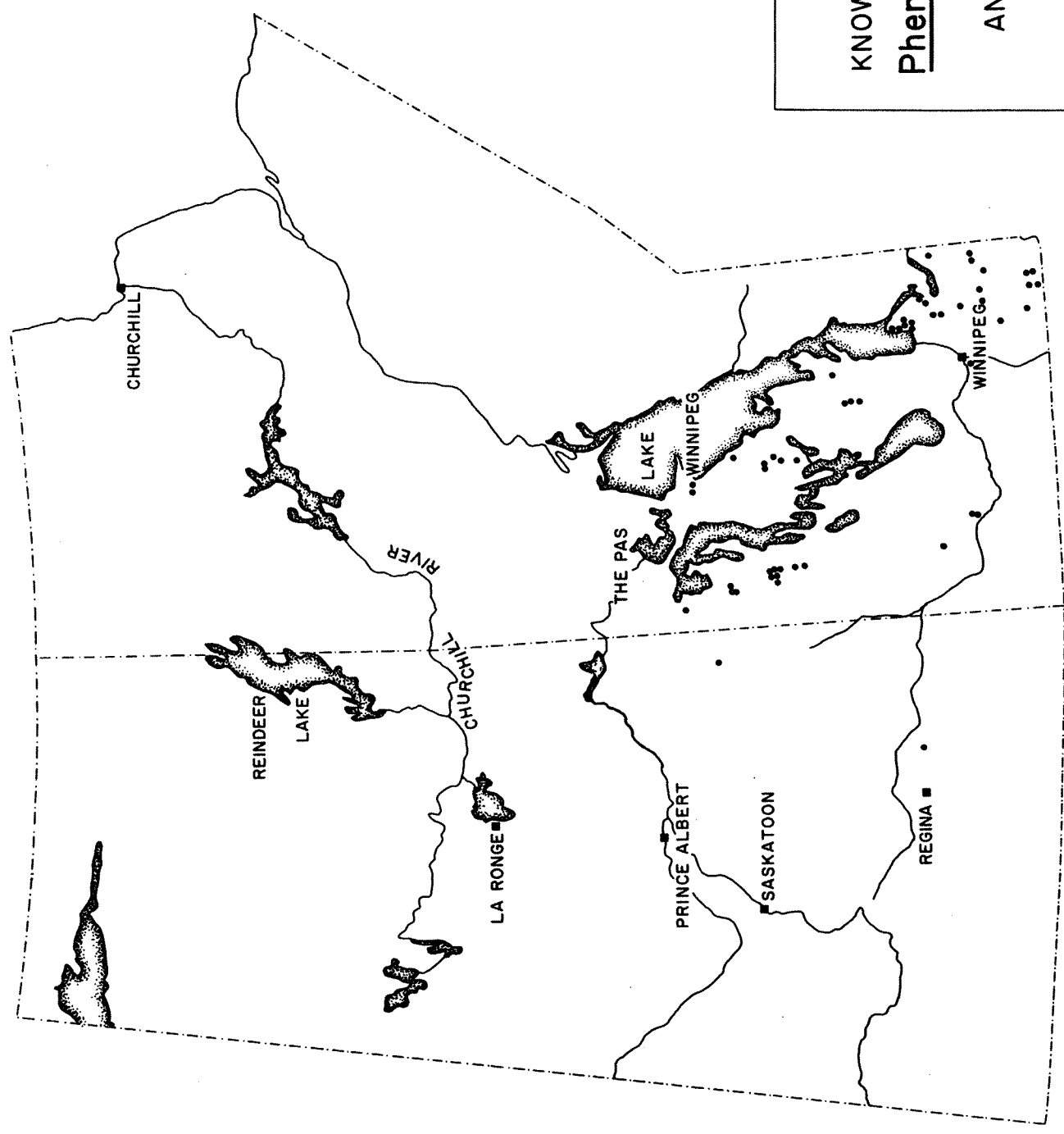
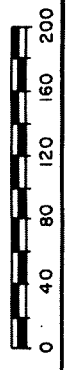
KNOWN DISTRIBUTION OF
Pissodes strobi
 IN MANITOBA
 AND SASKATCHEWAN



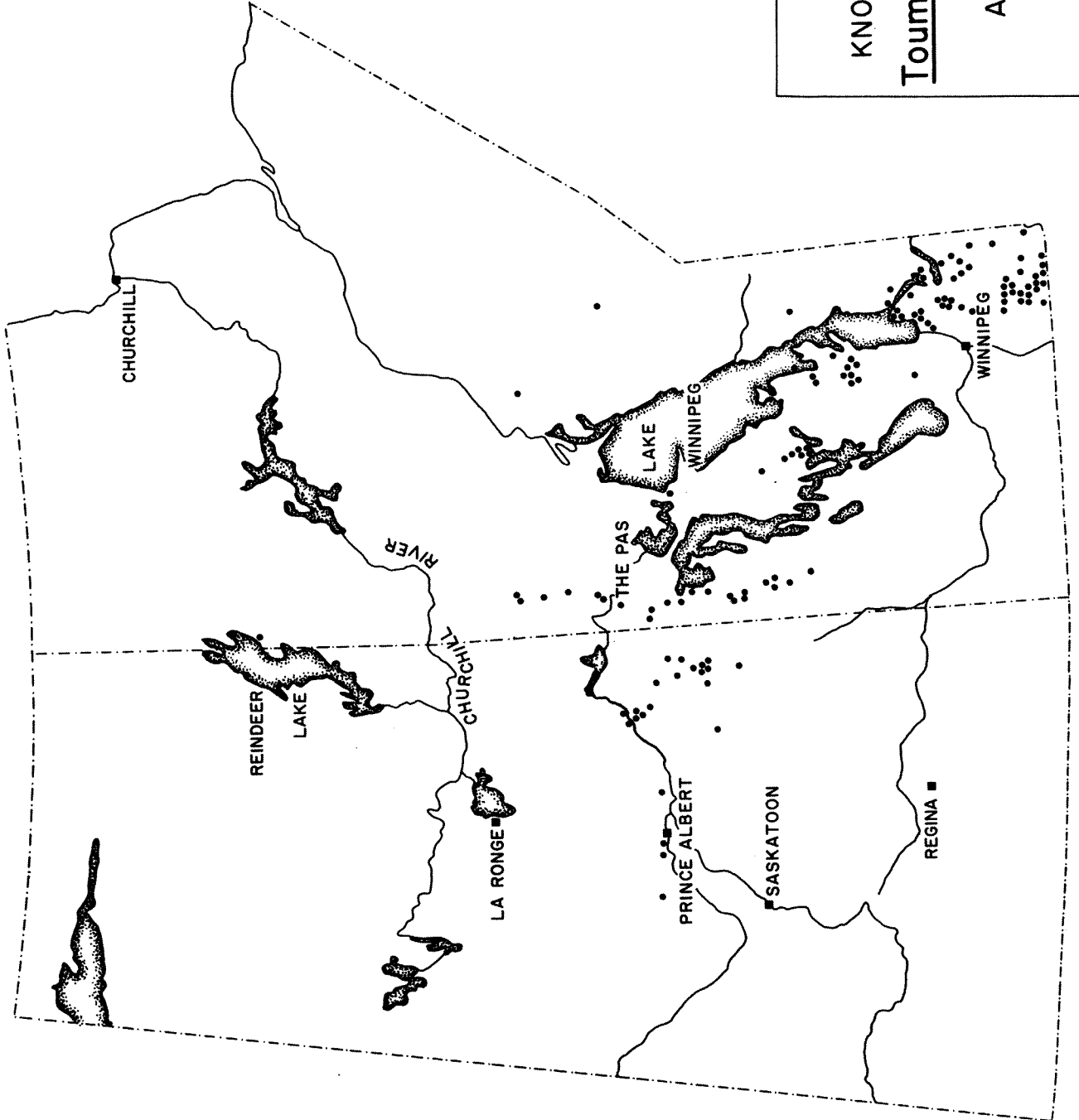
KNOWN DISTRIBUTION OF
Aphrophora spp.
IN MANITOBA
AND SASKATCHEWAN



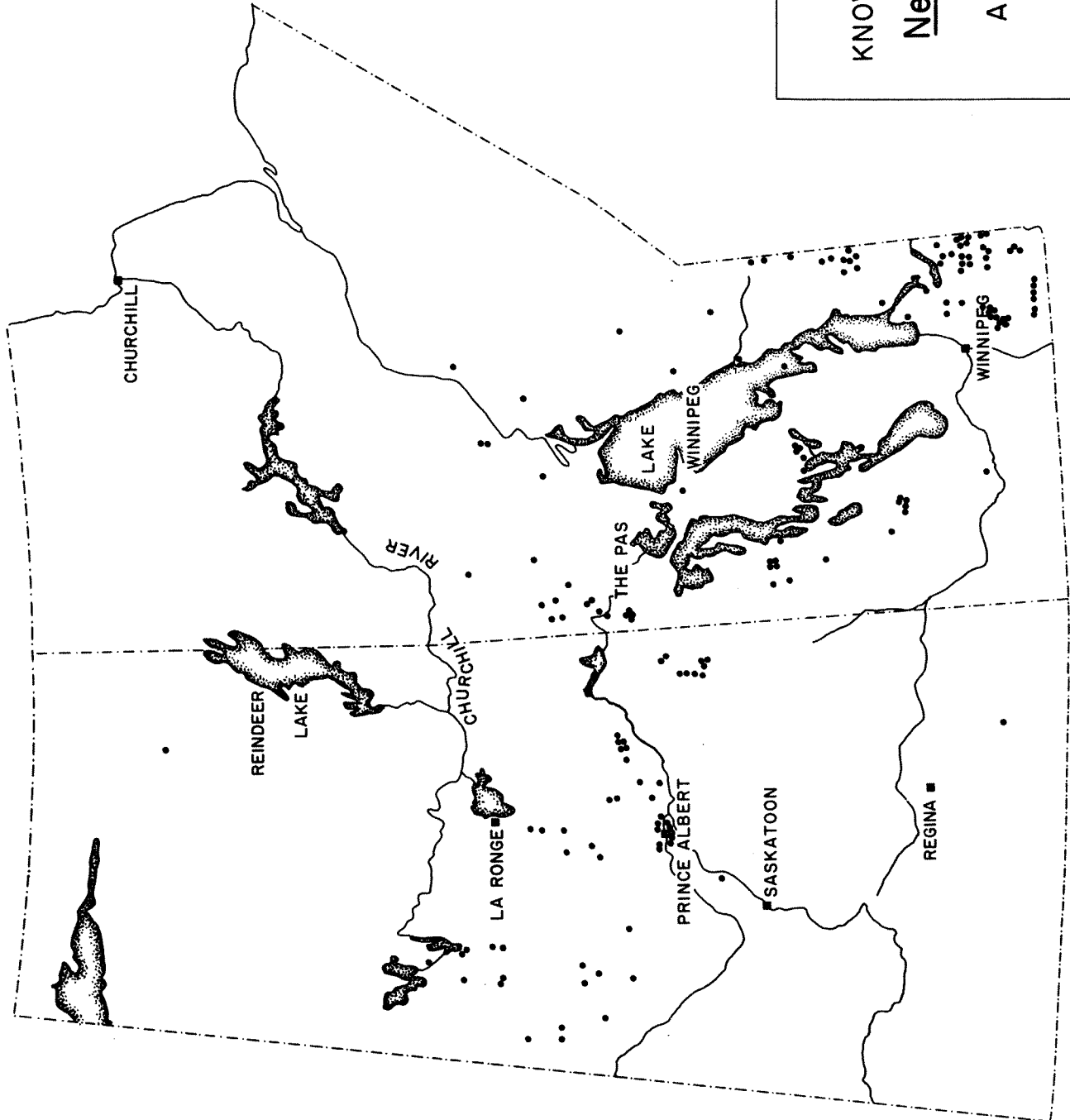
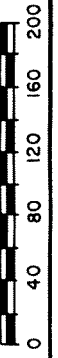
KNOWN DISTRIBUTION OF
Phenacaspis pinifoliae
IN MANITOBA
AND SASKATCHEWAN



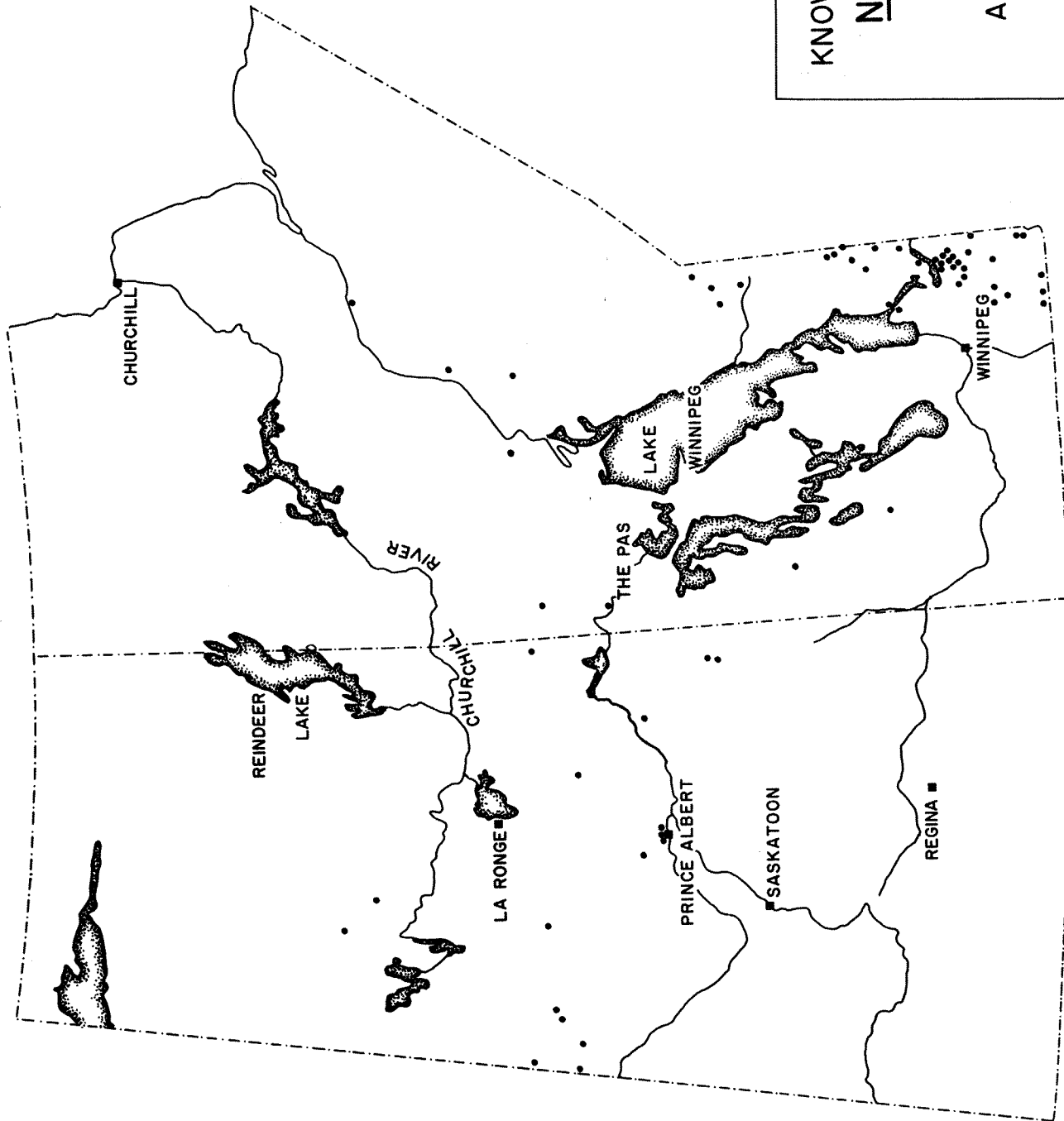
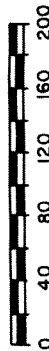
KNOWN DISTRIBUTION OF
Toumeyella numismaticum
IN MANITOBA
AND SASKATCHEWAN



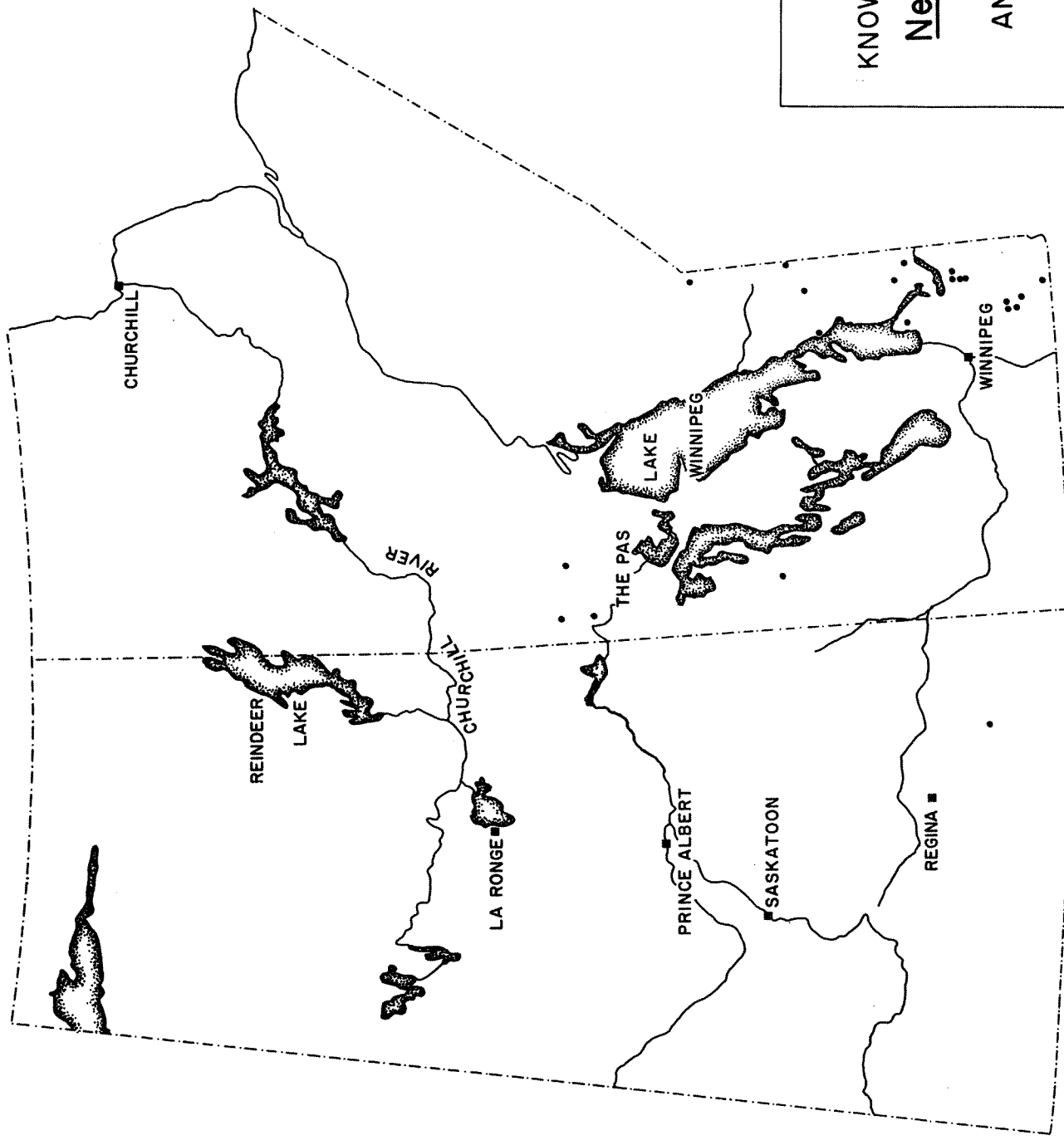
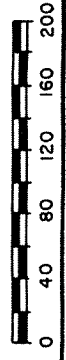
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Neodiprion nanulus
IN MANITOBA
AND SASKATCHEWAN



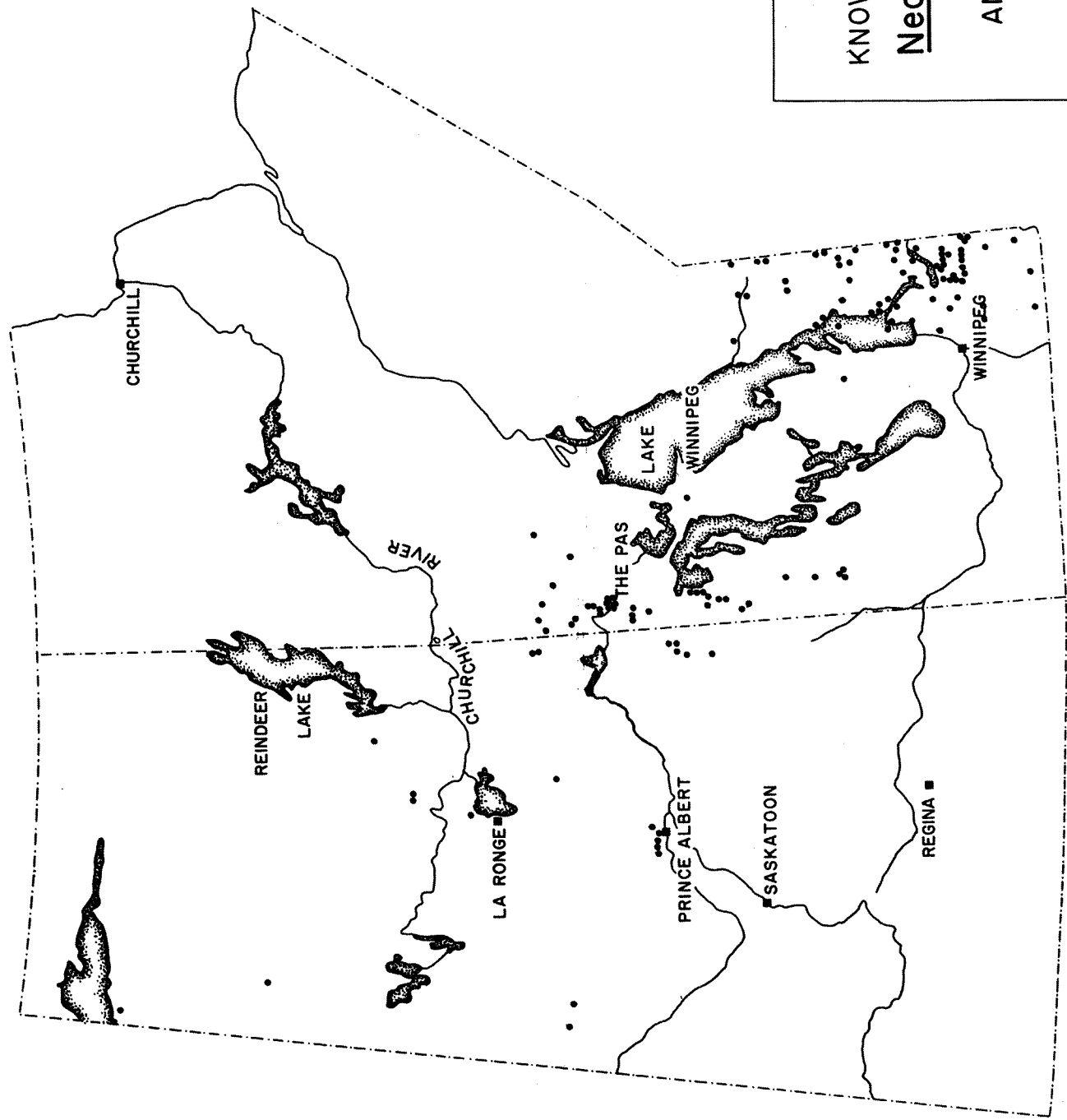
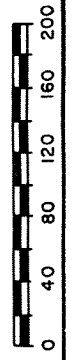
KNOWN DISTRIBUTION OF
Neodiprion pratti
banksianae
IN MANITOBA
AND SASKATCHEWAN



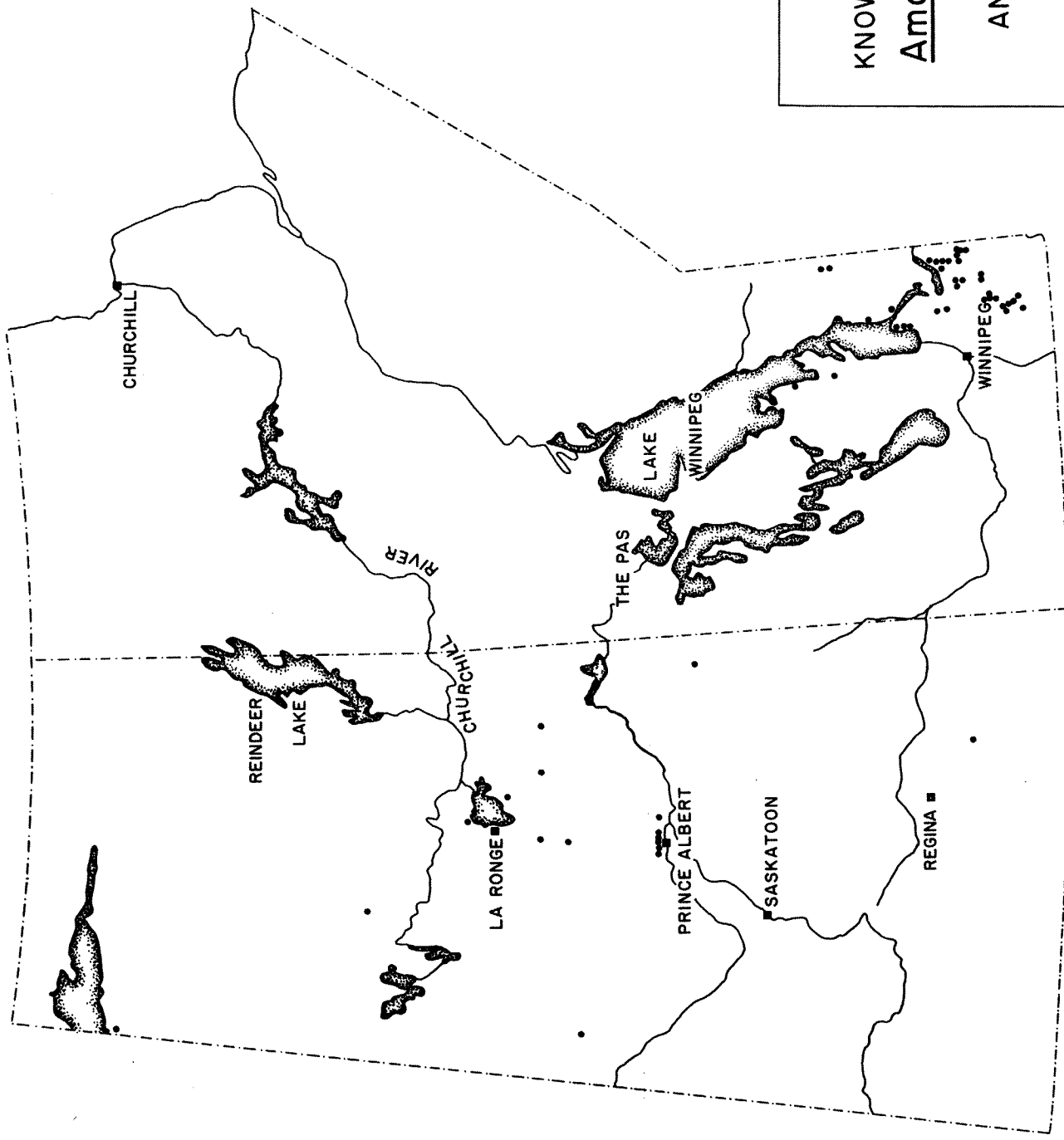
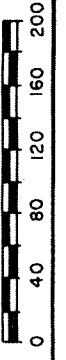
KNOWN DISTRIBUTION OF
Neodiprion swainei
IN MANITOBA
AND SASKATCHEWAN



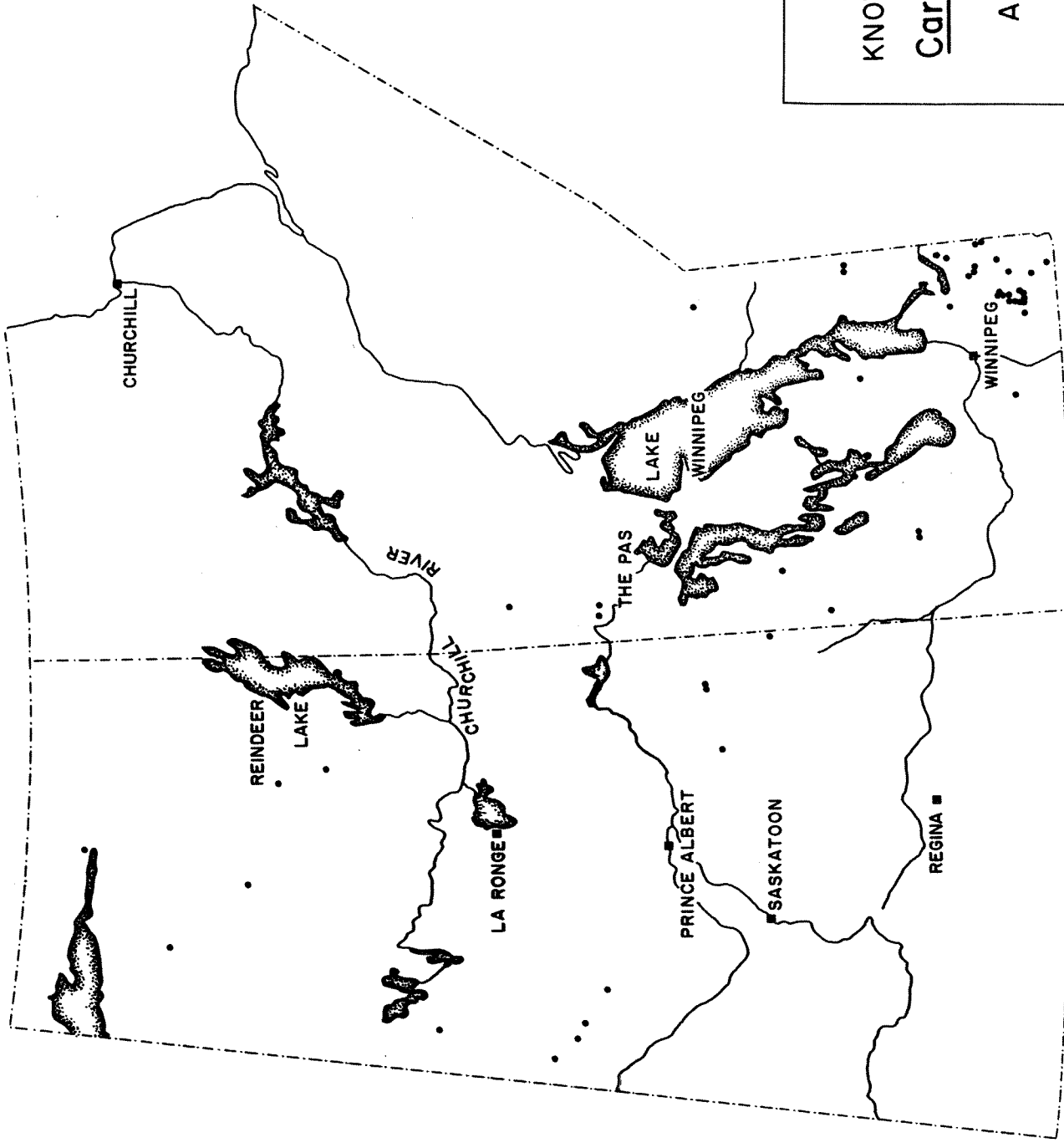
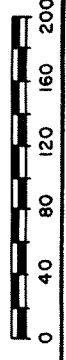
KNOWN DISTRIBUTION OF
Neodiprion virginiana
IN MANITOBA
AND SASKATCHEWAN



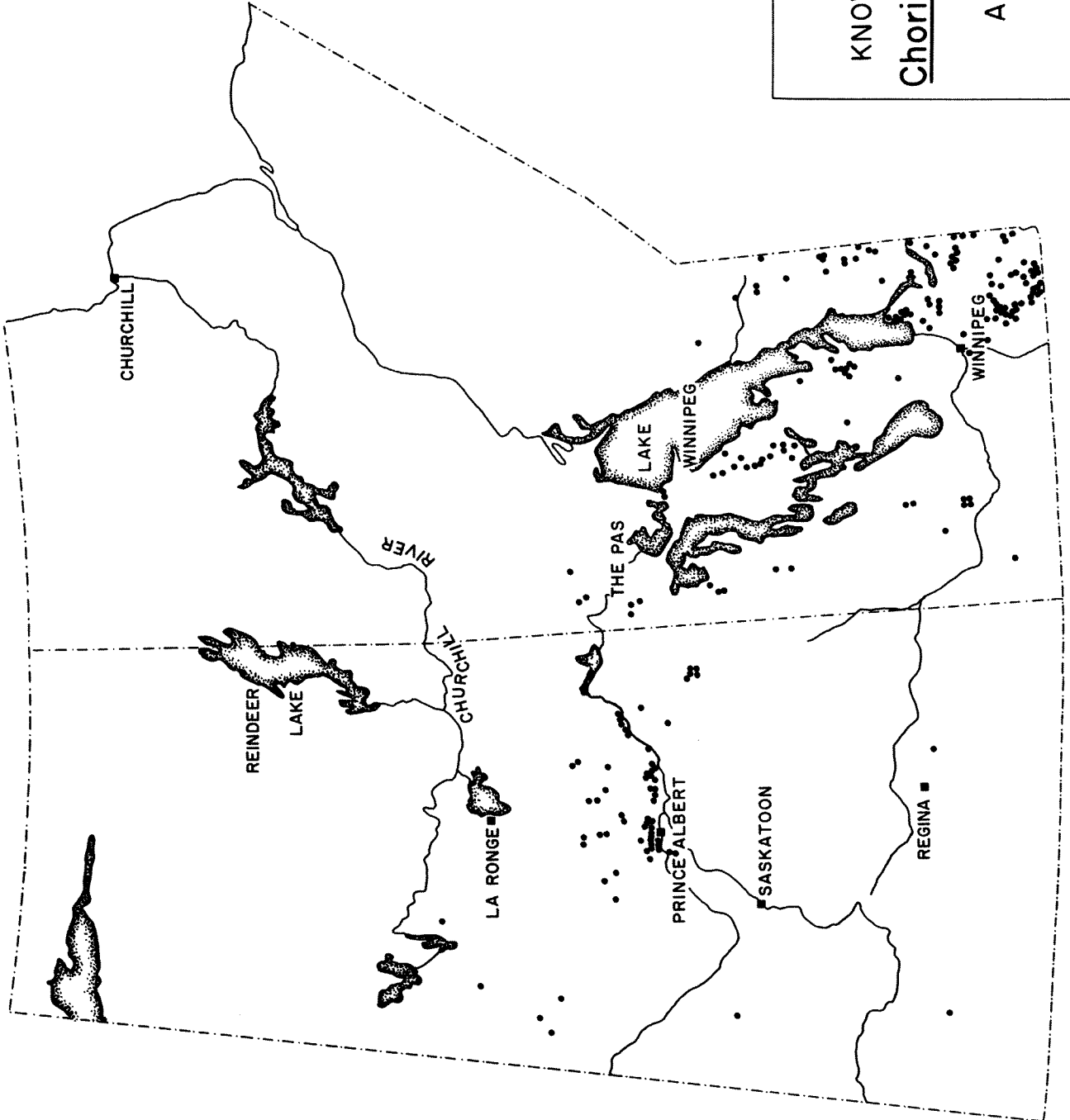
KNOWN DISTRIBUTION OF
Amorbia humerosana
IN MANITOBA
AND SASKATCHEWAN



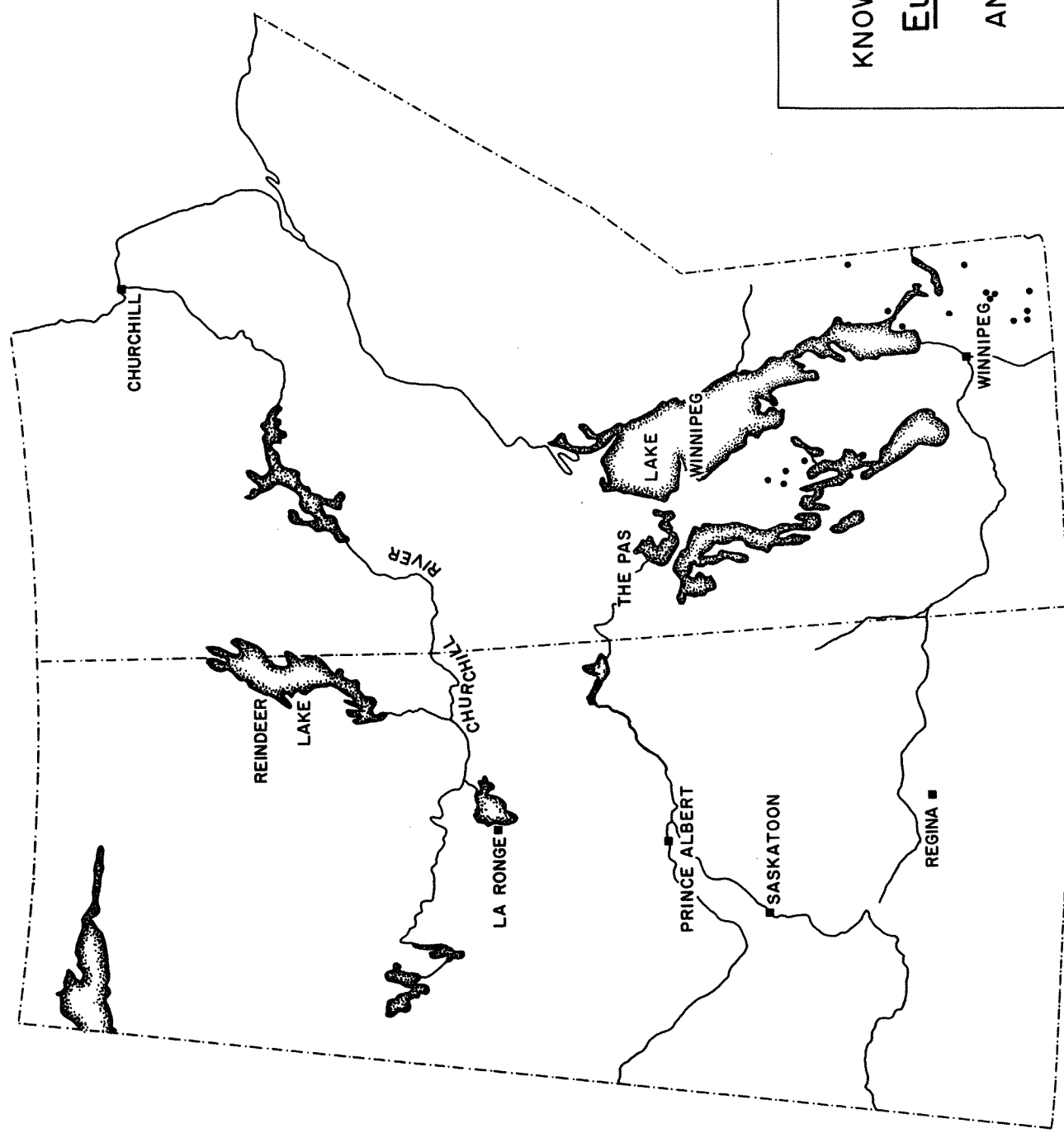
KNOWN DISTRIBUTION OF
Caripeta anqustiorata
IN MANITOBA
AND SASKATCHEWAN



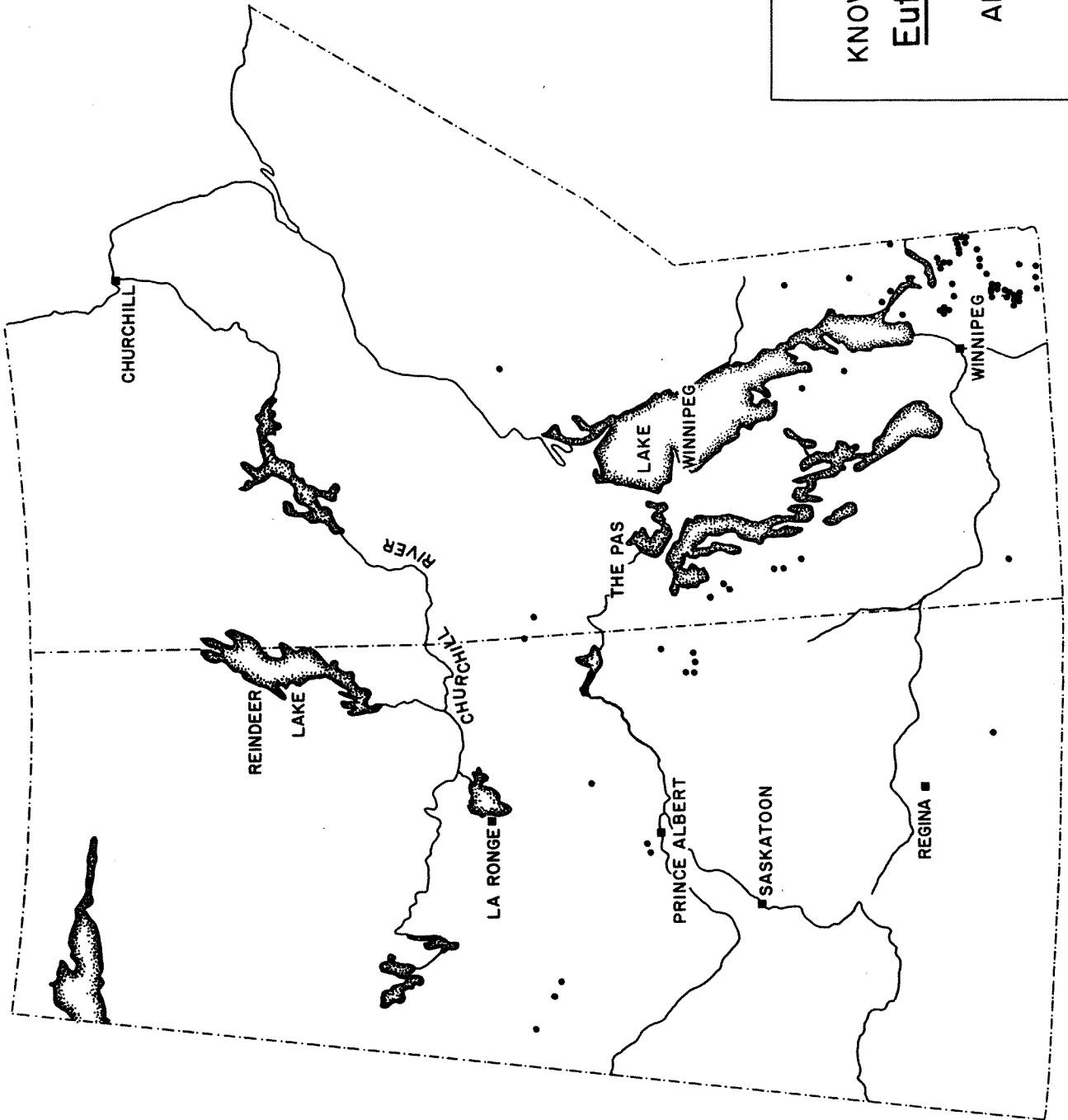
KNOWN DISTRIBUTION OF
Choristoneura pinus pinus
IN MANITOBA
AND SASKATCHEWAN



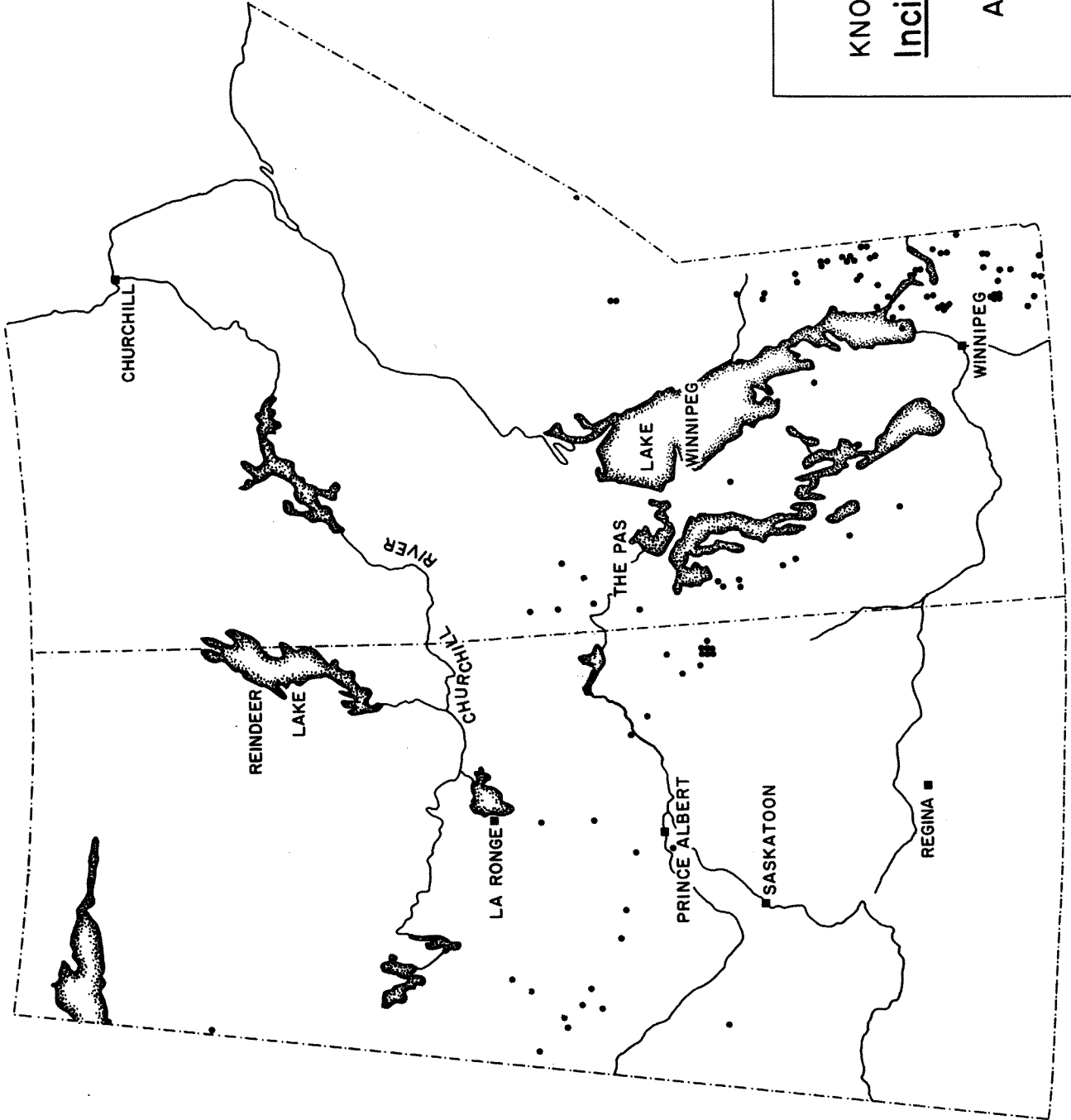
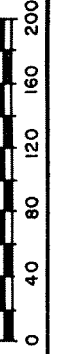
KNOWN DISTRIBUTION OF
Eucosma gloriola
IN MANITOBA
AND SASKATCHEWAN



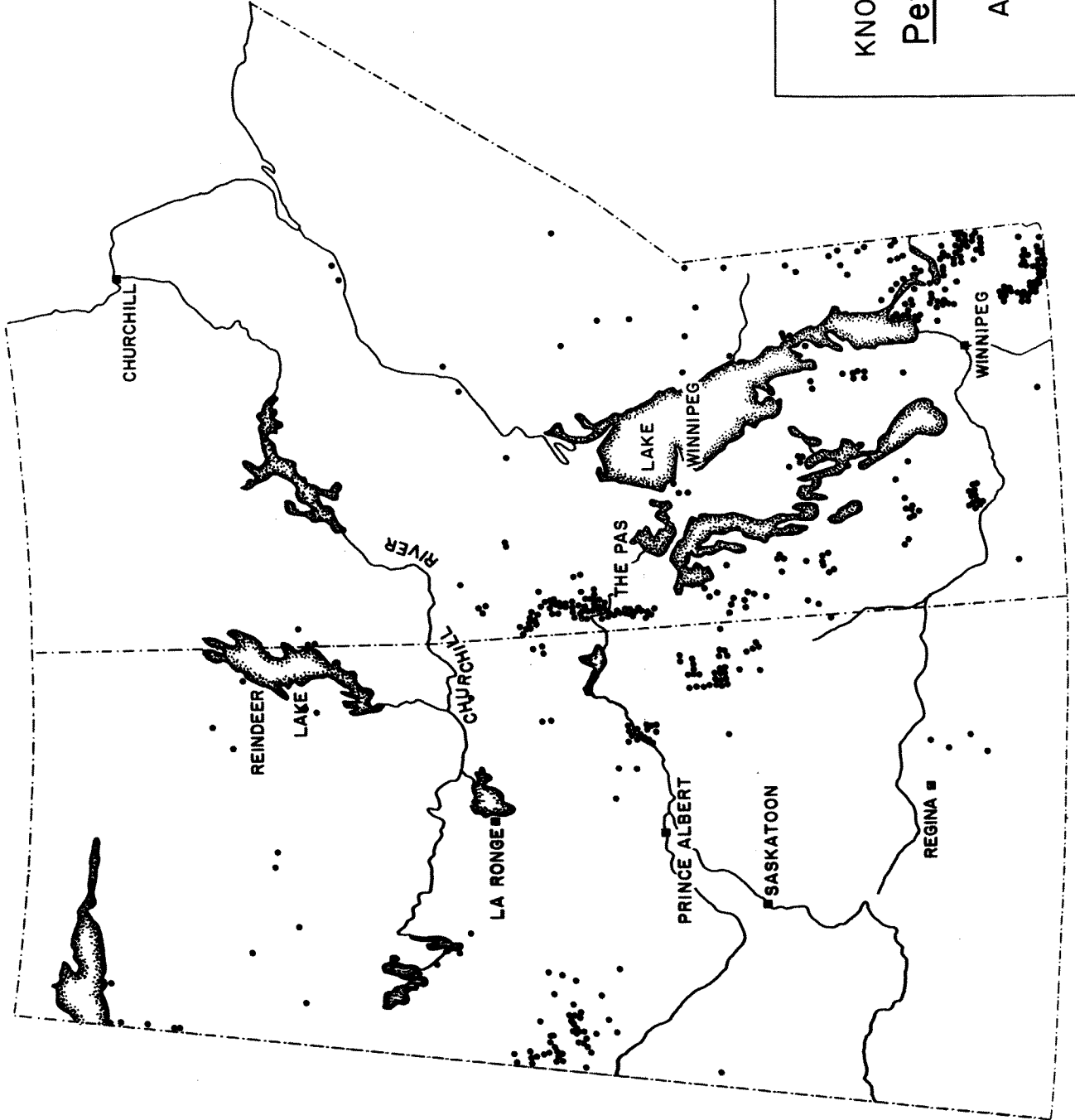
KNOWN DISTRIBUTION OF
Eufidonia notataria
IN MANITOBA
AND SASKATCHEWAN



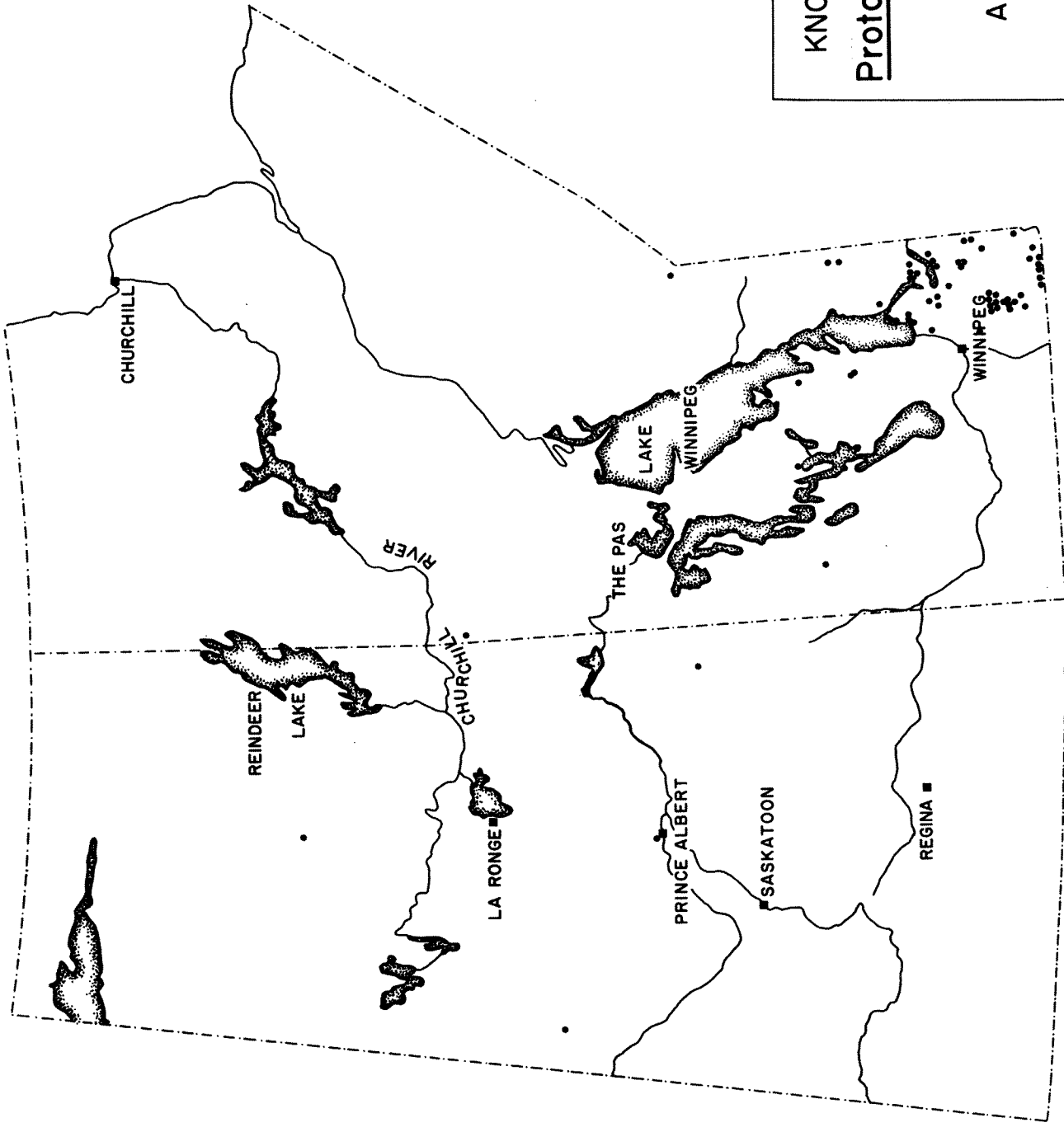
KNOWN DISTRIBUTION OF
Incisalia niphon clarki
IN MANITOBA
AND SASKATCHEWAN



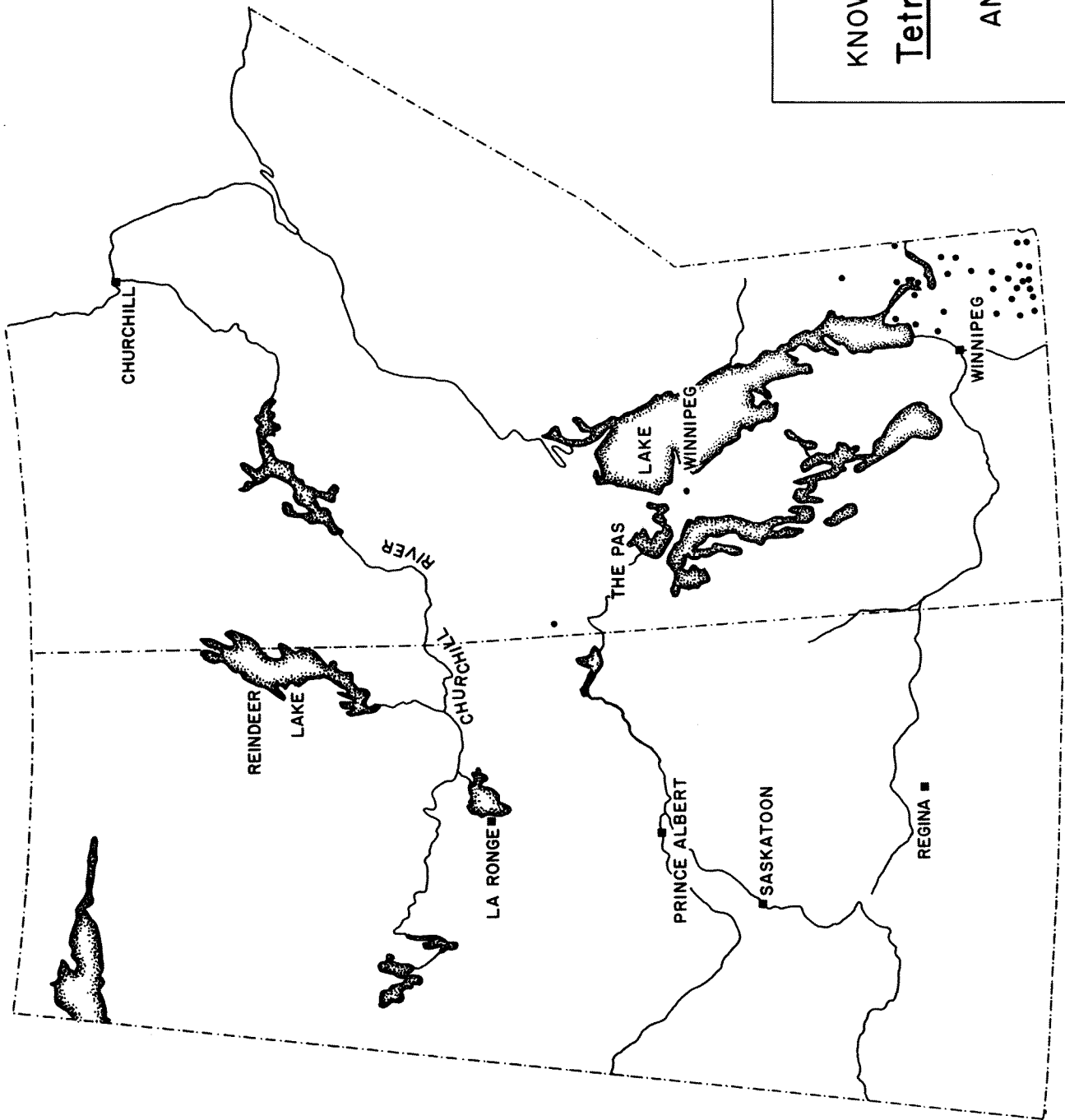
KNOWN DISTRIBUTION OF
Petrova albicapitana
IN MANITOBA
AND SASKATCHEWAN



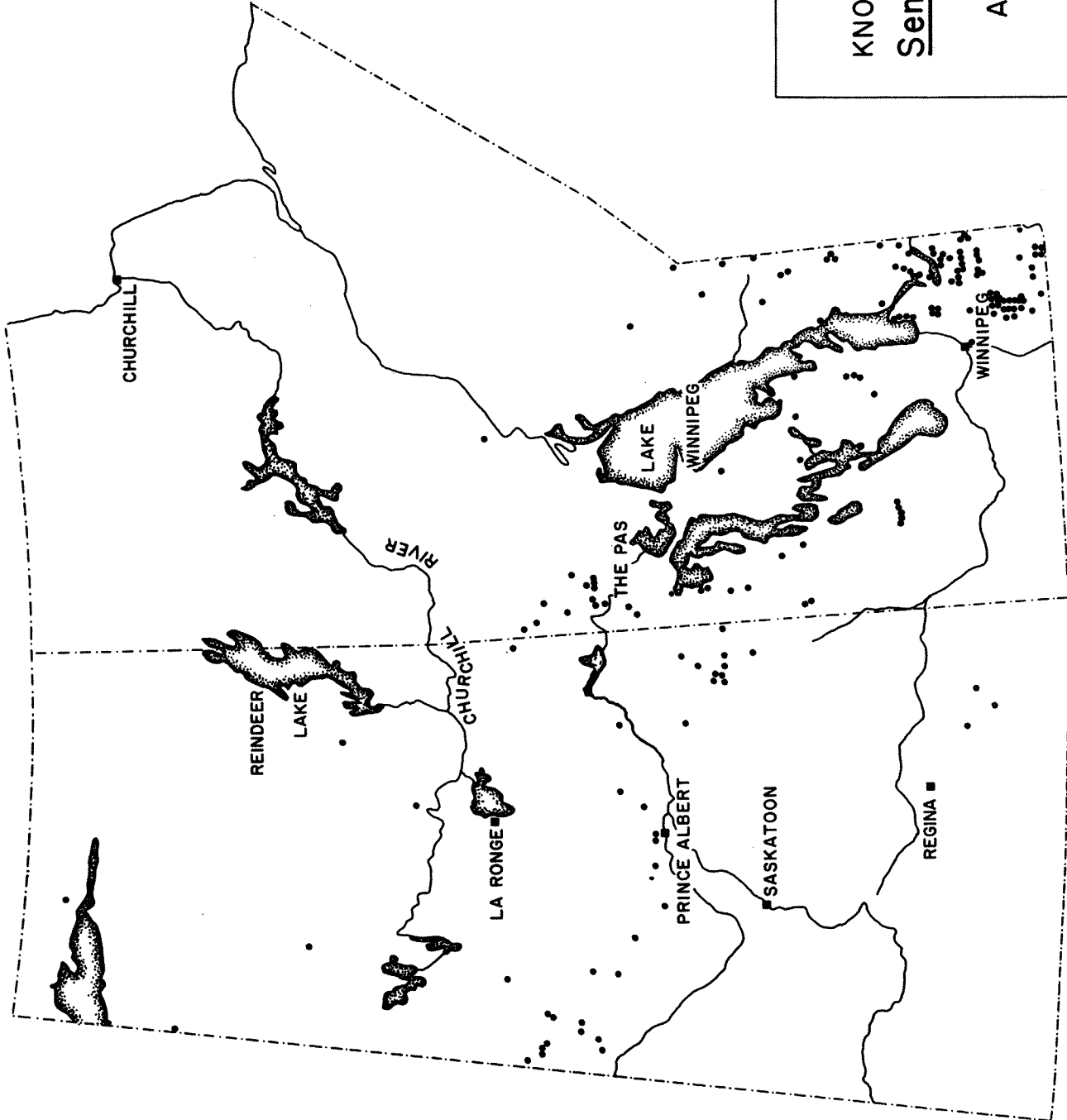
KNOWN DISTRIBUTION OF
Protoarmia porcelaria
indicataria
IN MANITOBA
AND SASKATCHEWAN



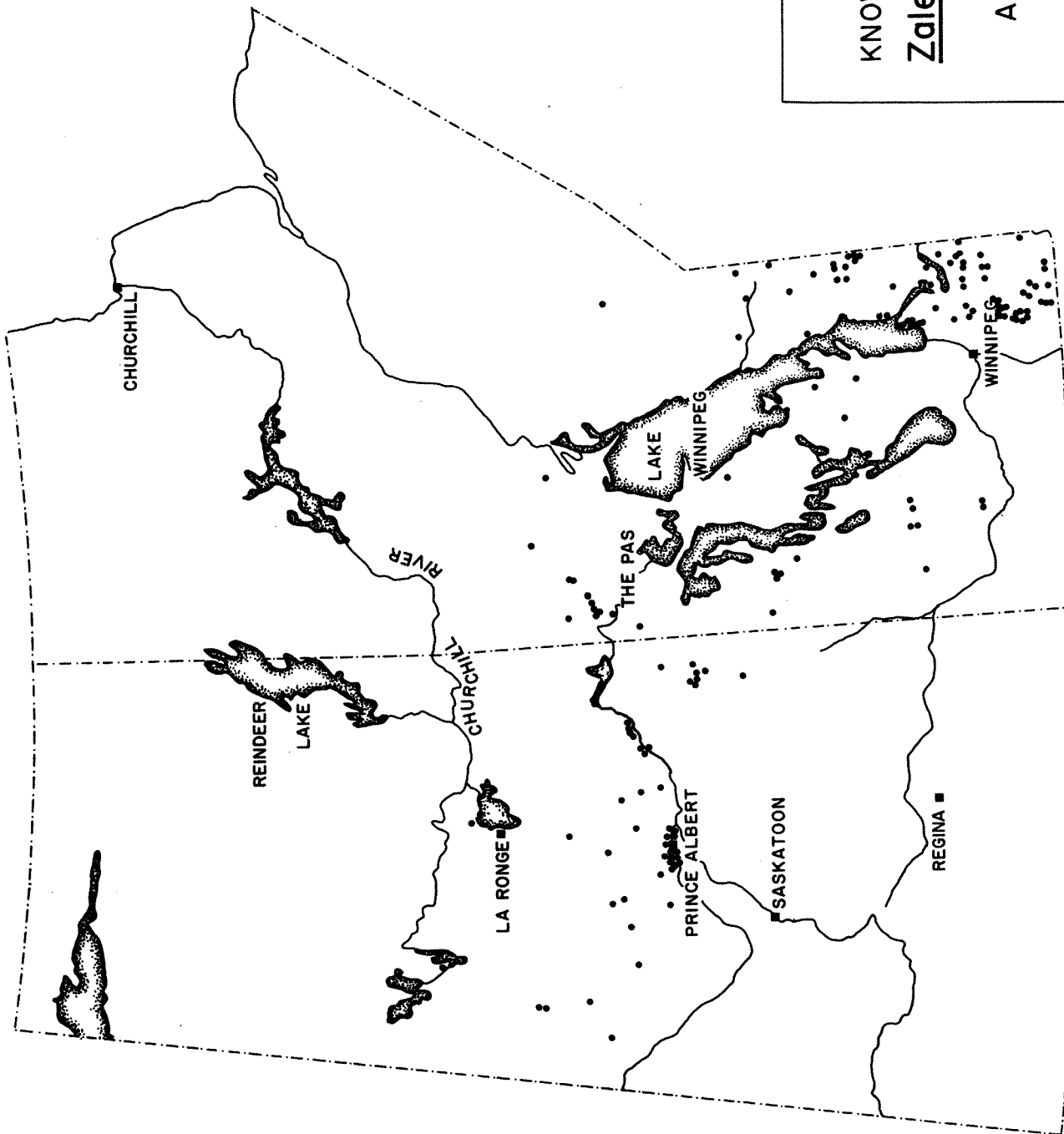
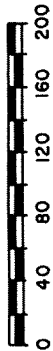
KNOWN DISTRIBUTION OF
Tetralopha robustella
IN MANITOBA
AND SASKATCHEWAN



KNOWN DISTRIBUTION OF
Semiothisa bicolorata
IN MANITOBA
AND SASKATCHEWAN



KNOWN DISTRIBUTION OF
Zale duplicata largera
IN MANITOBA
AND SASKATCHEWAN



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