

Residual Weed Population Shifts in Manitoba – 1978 to 2016

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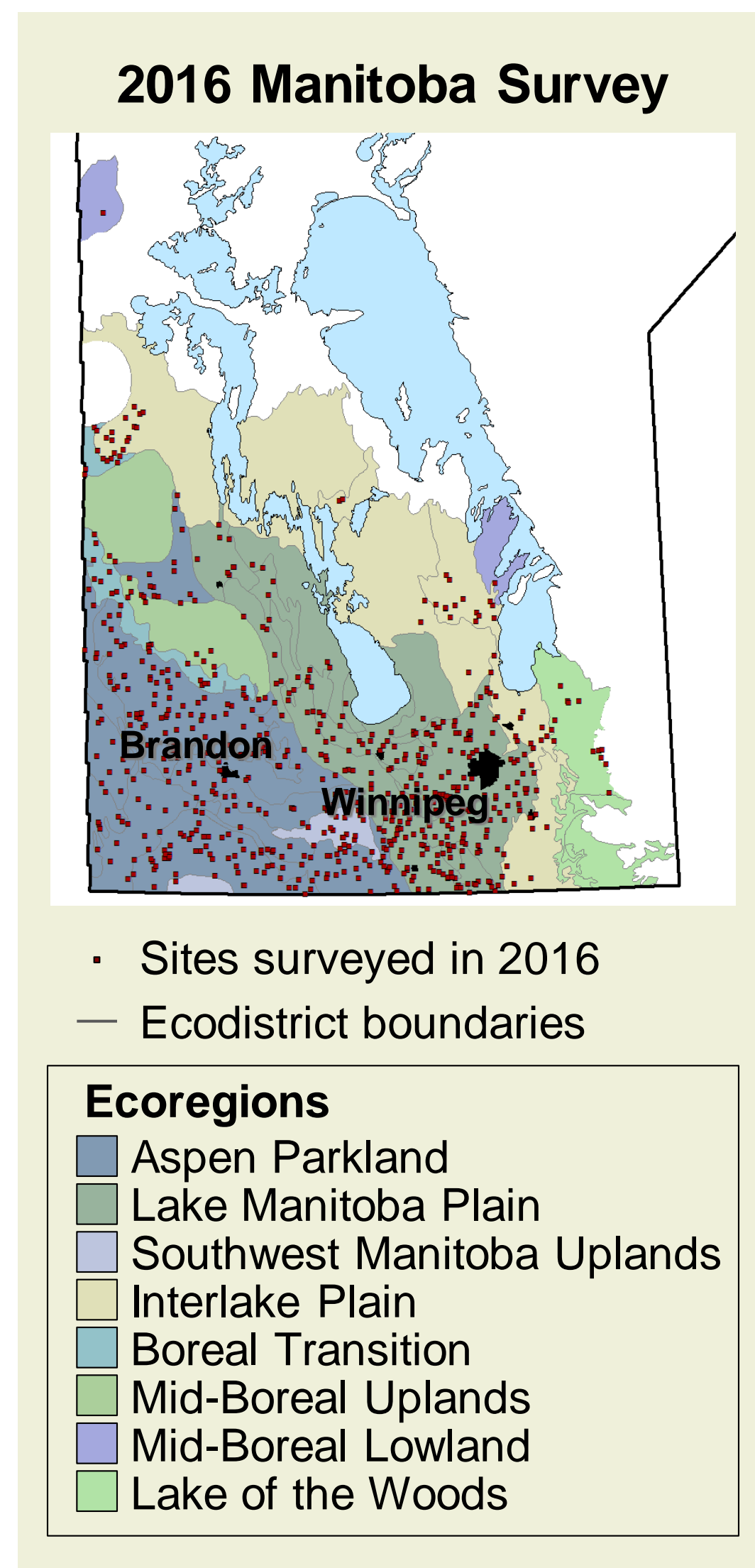
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Objectives

- Present the top twenty species in 2016 Manitoba provincial weed survey
- Compare the relative abundance of weeds in Manitoba in 2016 with results from the 2002, 1997, 1986 and 1978-1981 provincial surveys
- Identify shifts in life form density and relative abundance

Methods

- Used a stratified random sampling procedure to select fields in ecodistricts shown on map
- Surveyed 659 fields of canola, spring wheat, soybean, corn, barley, oat, flax and sunflower
- Counted weeds in 20 quadrats (50 by 50 cm) per field in late summer (residual populations)
- Data weighted in analysis based on distribution of surveyed crops in 2011 census
- Summarized weed data using a relative abundance index based on frequency, field uniformity and density
- Frequency = % of fields in which species occurred
- Uniformity = % of quadrats in which species occurred
- Density = Average density of species in all fields
- Compared top twenty species from surveys of:
 - 631 fields in 2002
 - 452 fields in 1997
 - 501 fields in 1986
 - 1424 fields in 1970s (1978-1981)



Species Shifts

Species	Relative Abundance Rank					Change
	1970s	1986	1997	2002	2016	
Spiny annual sow-thistle	77	74	36	14	15	62
Yellow foxtail	48	40	27	30	6	42
Broad-leaved plantain	39	52	31	35	11	28
Biennial wormwood	45	55	44	49	20	25
Canola/rapeseed	29	28	19	9	5	24
Dandelion	26	36	20	10	7	19
False cleavers	34	21	14	15	17	17
Round-leaved mallow	25	23	21	16	10	15
Chickweed	32	15	12	22	18	14
Wheat	20	19	22	12	9	11
Barnyard grass species	13	27	11	4	3	10
<i>Wild buckwheat</i>	3	3	3	3	2	1
<i>Redroot pigweed</i>	9	8	5	6	8	1
Kochia	31	30	24	17	30	1
<i>Green foxtail</i>	1	1	1	1	1	0
<i>Wild oats</i>	2	2	2	2	4	-2
Field horsetail	18	18	26	23	21	-3
<i>Night-flowering catchfly</i>	10	13	15	18	16	-6
Shepherd's-purse	21	17	13	27	27	-6
<i>Lamb's-quarters</i>	7	6	9	7	14	-7
<i>Canada thistle</i>	5	9	4	5	13	-8
<i>Pale smartweed</i>	4	5	7	8	12	-8
Thyme-leaved spurge	19	26	23	21	28	-9
<i>Perennial sow-thistle</i>	8	11	8	20	19	-11
Hemp-nettle	17	14	16	24	32	-15
Wild mustard	6	4	6	11	23	-17
Stinkweed	11	10	17	19	33	-22
Quack grass	12	12	10	13	38	-26
Dog mustard	30	20	37	41	63	-33
Barley	22	16	29	26	70	-48
Flax	15	7	18	25	75	-60
Russian thistle	14	24	33	57	97	-83
Bluebur	16	25	51	60	-	>-112

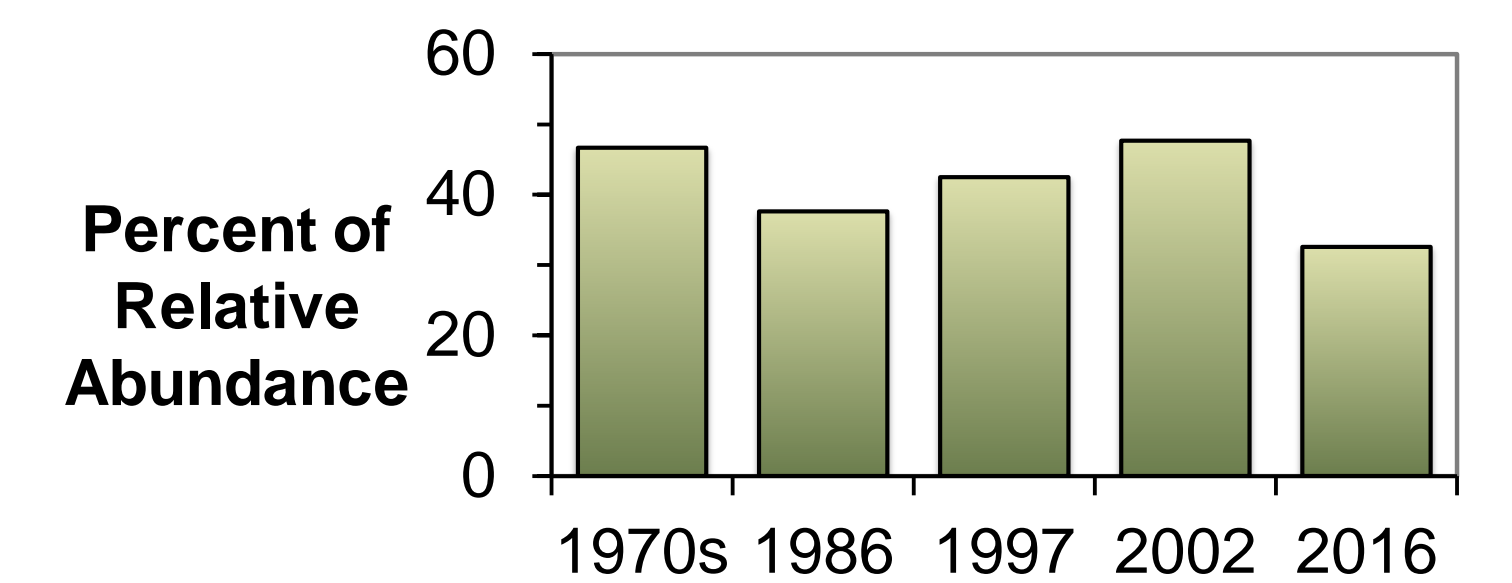
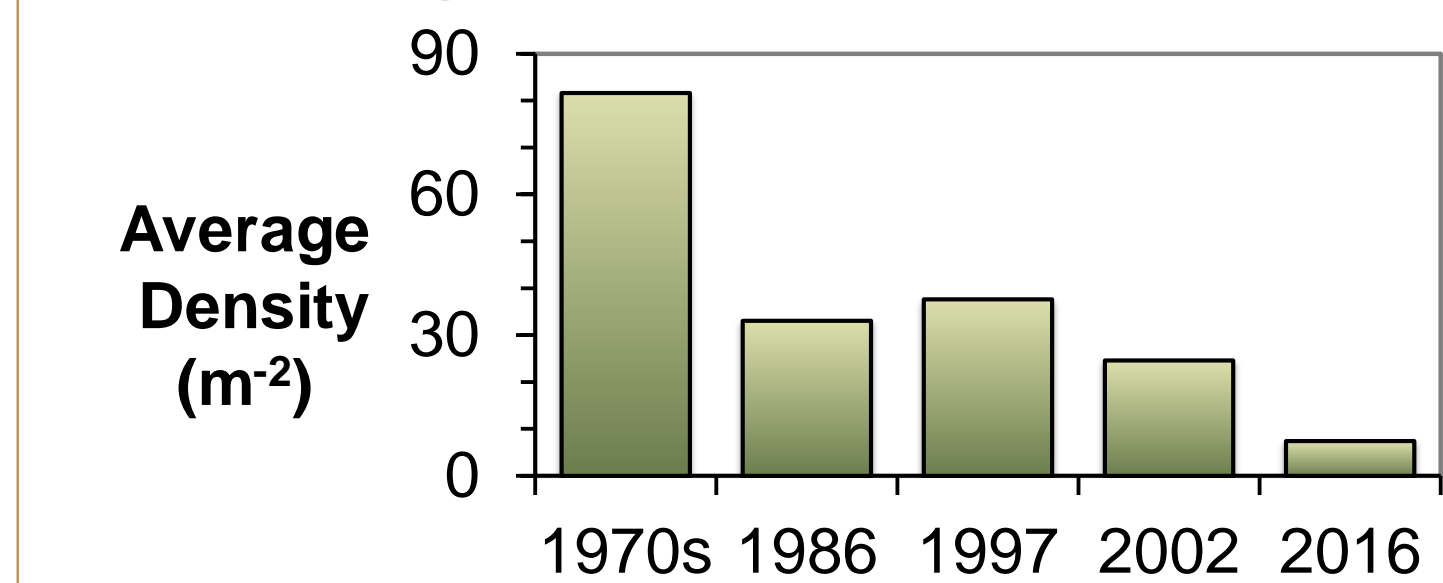
*Species in italics have maintained a position in the top 20 since 1970s

Species Shifts Summary

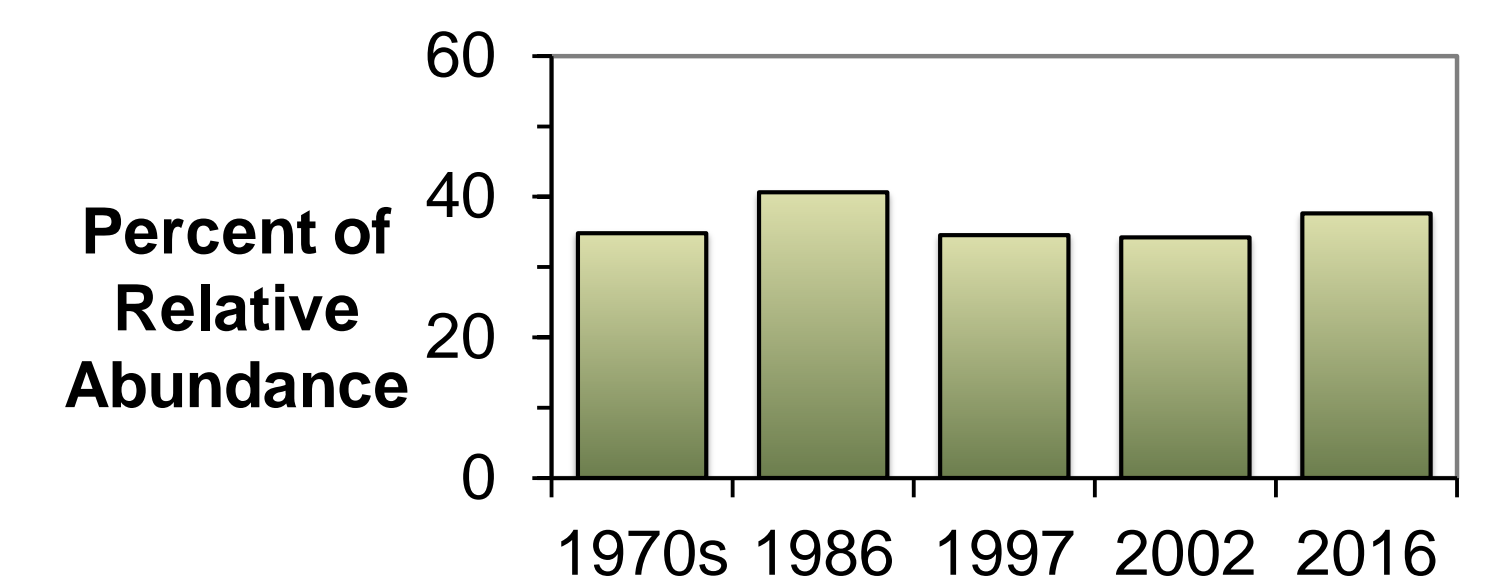
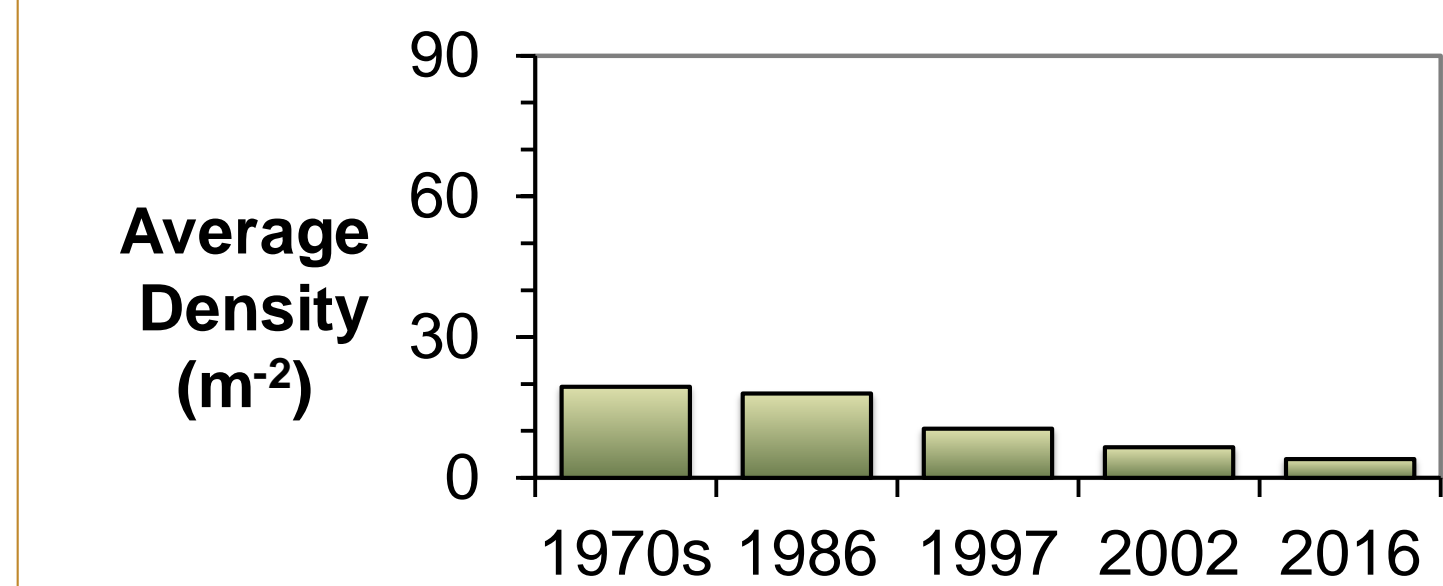
- Spiny annual sow-thistle has increased the most since the 1970s; however, it did not increase from 2002 to 2016
- Yellow foxtail, broad-leaved plantain and biennial wormwood appeared in the top twenty for the first time in 2016
- Other species that have increased since the 1970s include: canola, dandelion, false cleavers, round-leaved mallow, chickweed, wheat and barnyard grass species
- Nine species have been in the top 20 since the 1970s
- Green foxtail has been ranked first in every survey
- Wild oats fell from the second most abundant species to the fourth surpassed by wild buckwheat and barnyard grass species
- Of the fourteen species with the largest decline, only perennial sow-thistle did not decrease in the most recent survey

Life Form Shifts

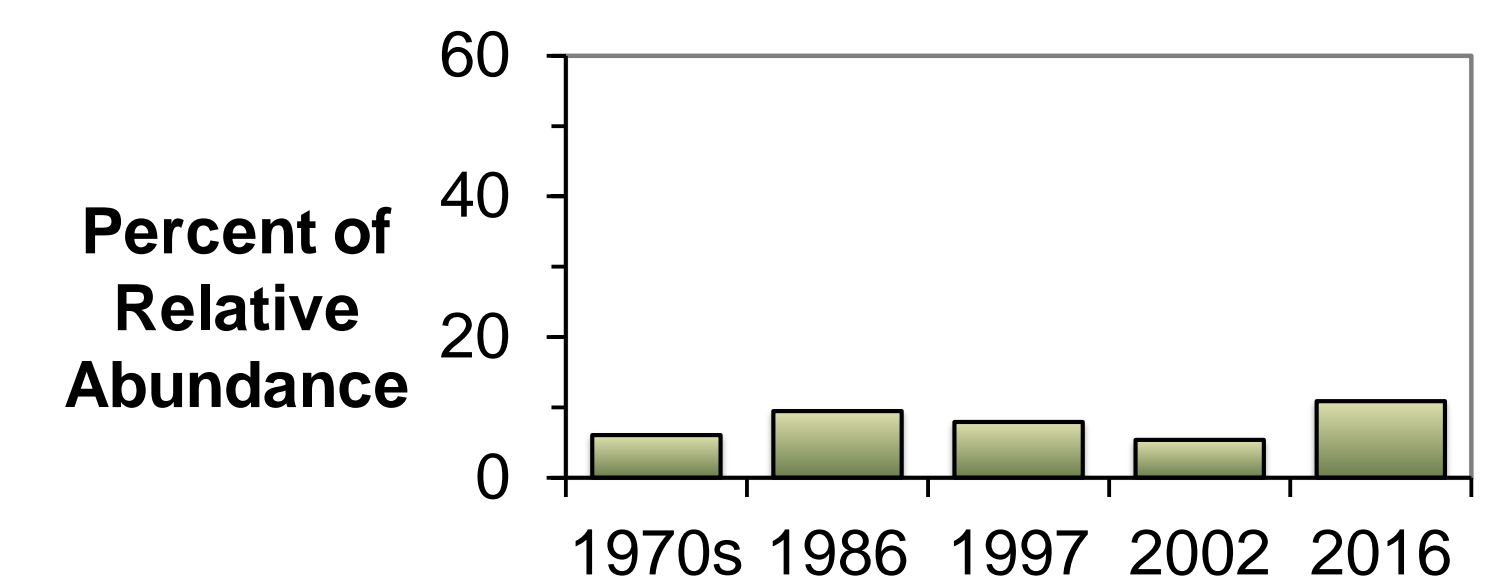
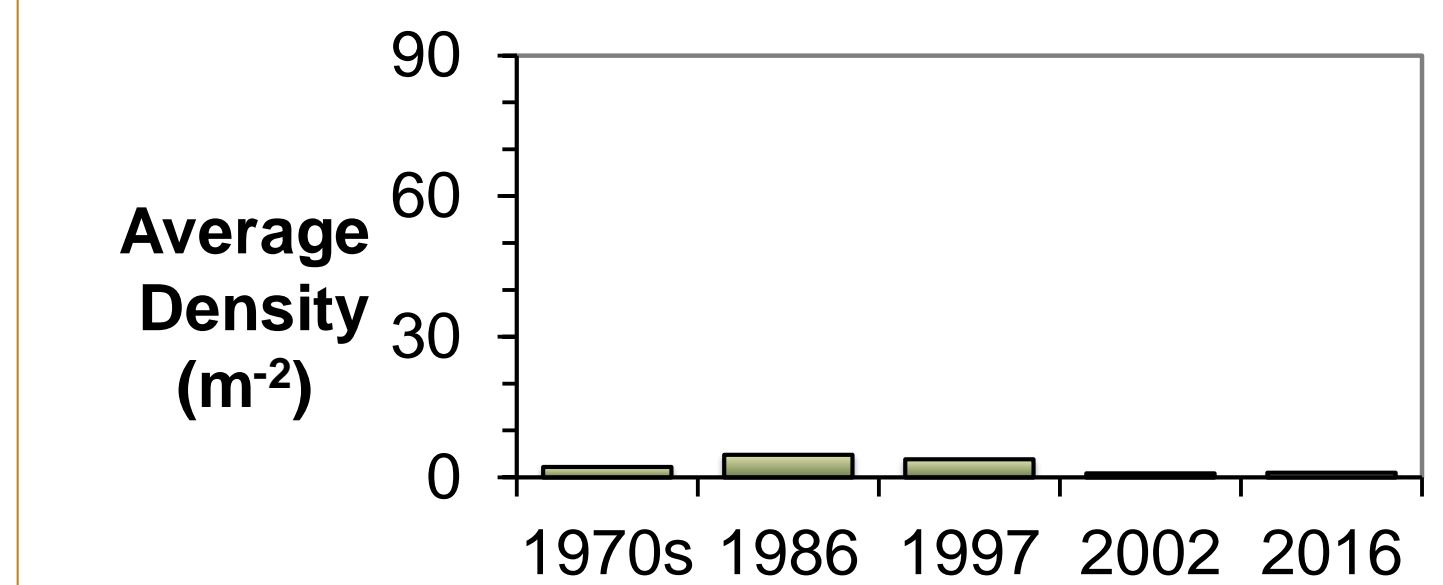
Annual grass



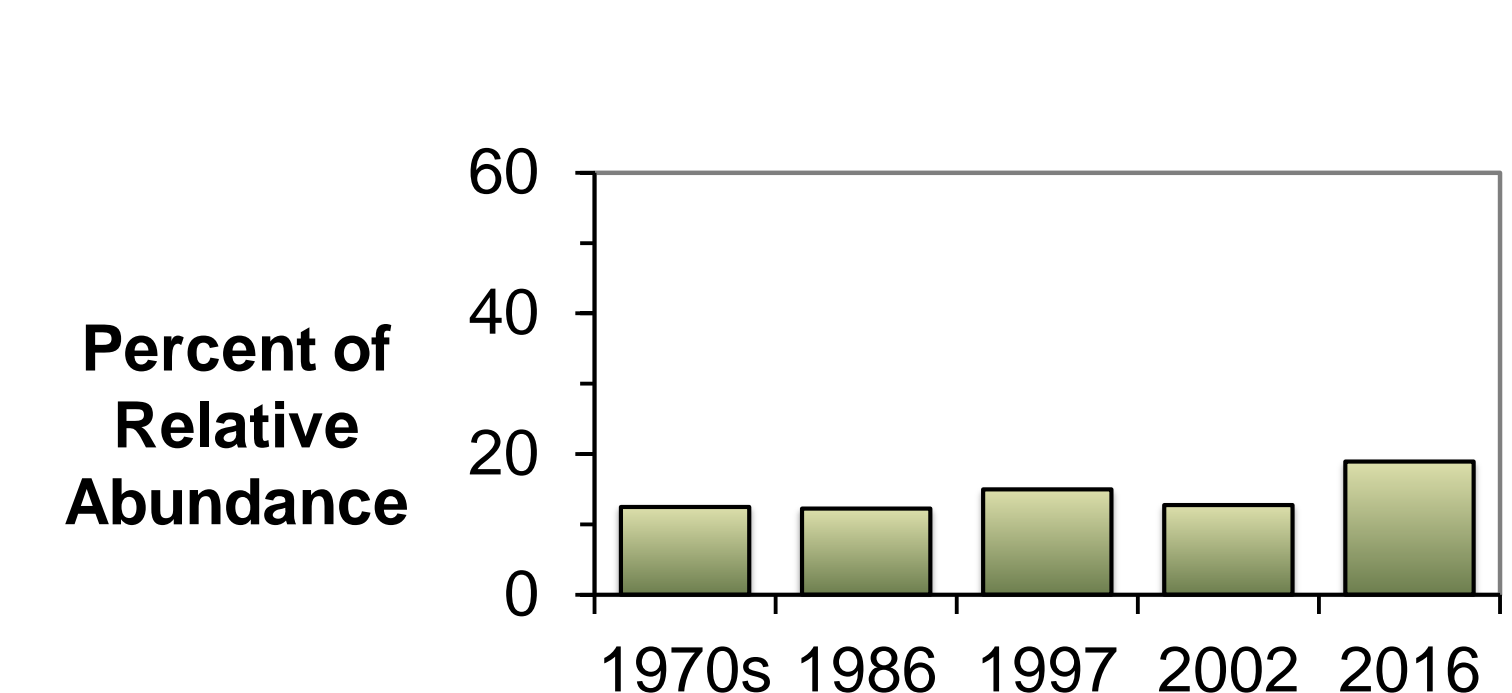
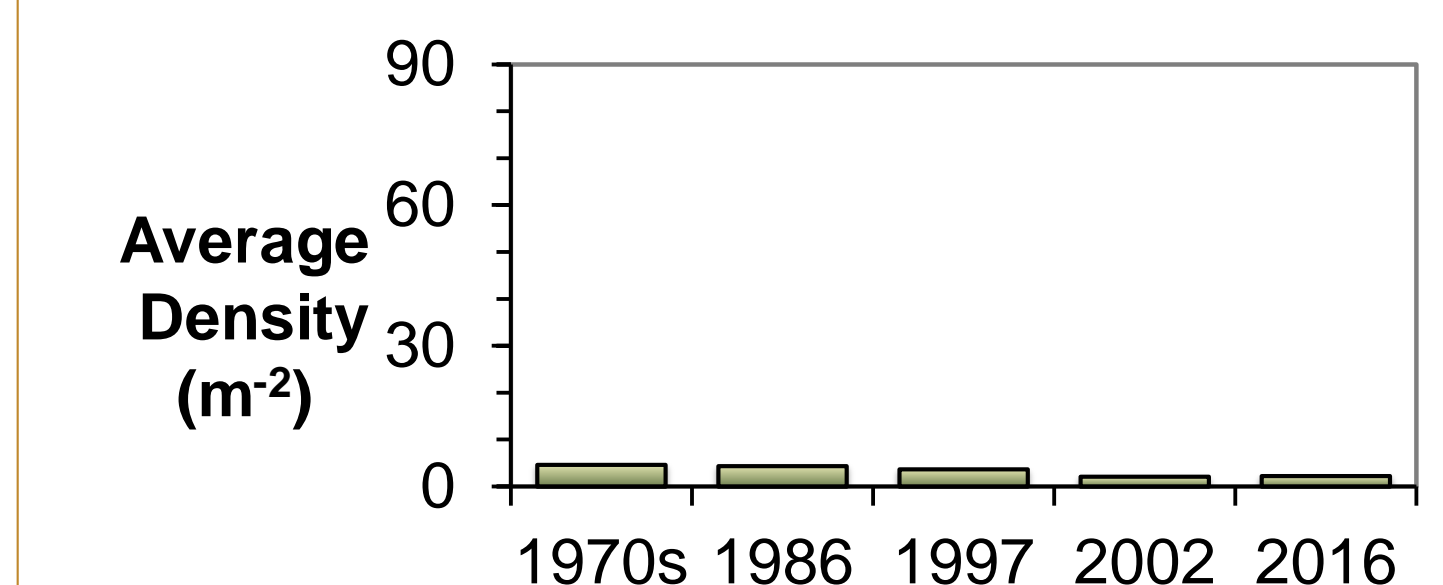
Annual broad-leaved



Facultative winter annual



Perennial



Life Form Shift Summary

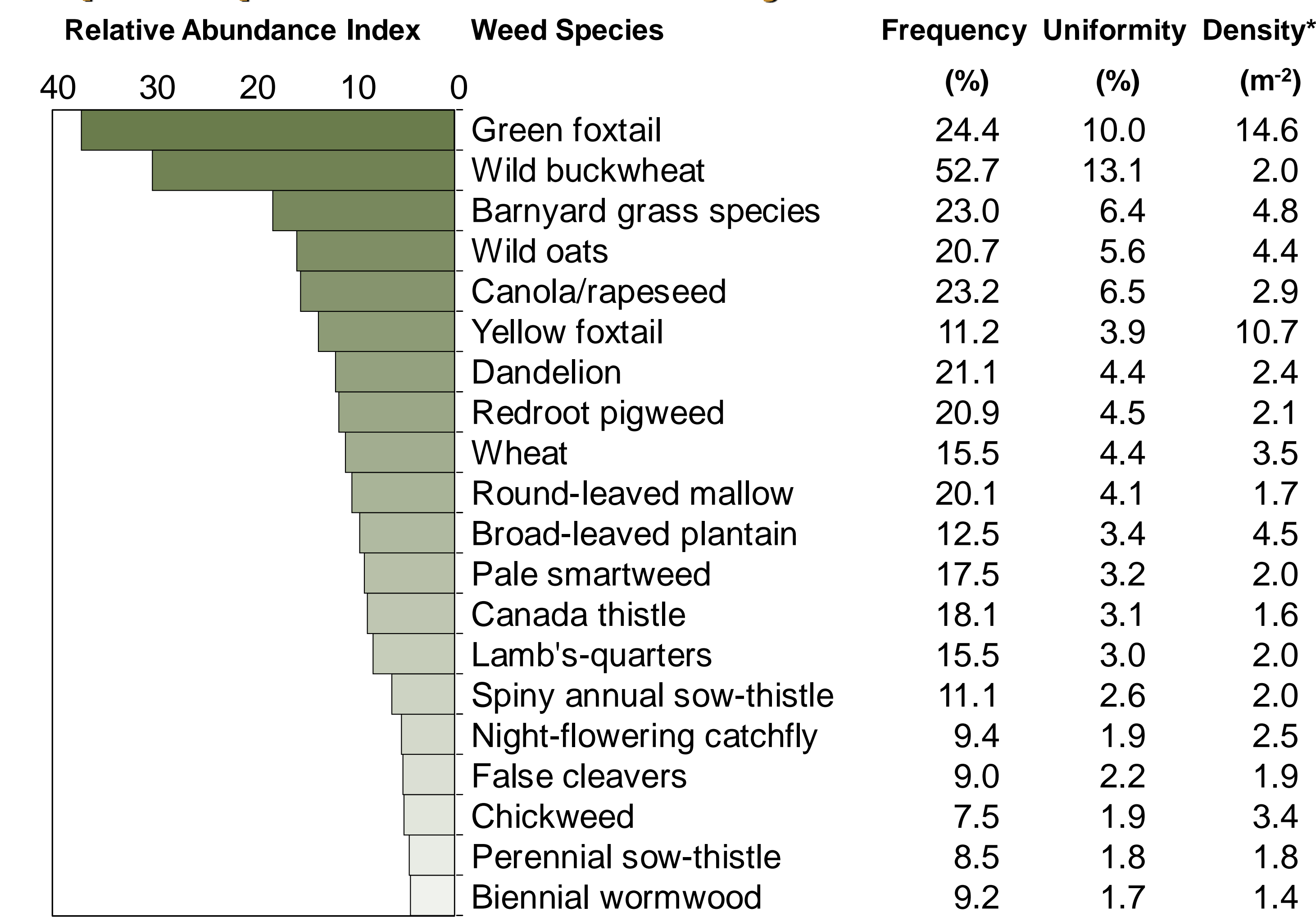
- The densities of annual grass and annual broad-leaved weeds in 2016 were the lowest ever recorded
- The relative abundance of annual grasses was lowest in the 2016 survey, while relative abundances of perennials and facultative winter annuals were the highest on record

Next Step

- Interpret shifts in terms of management practices based on information obtained from questionnaires completed by survey participants



Top 20 Species in 2016 Survey



*Average density in occurrence fields

Acknowledgements

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Sources

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