

# Residual Weed Population Shifts in Alberta – 1973 to 2017

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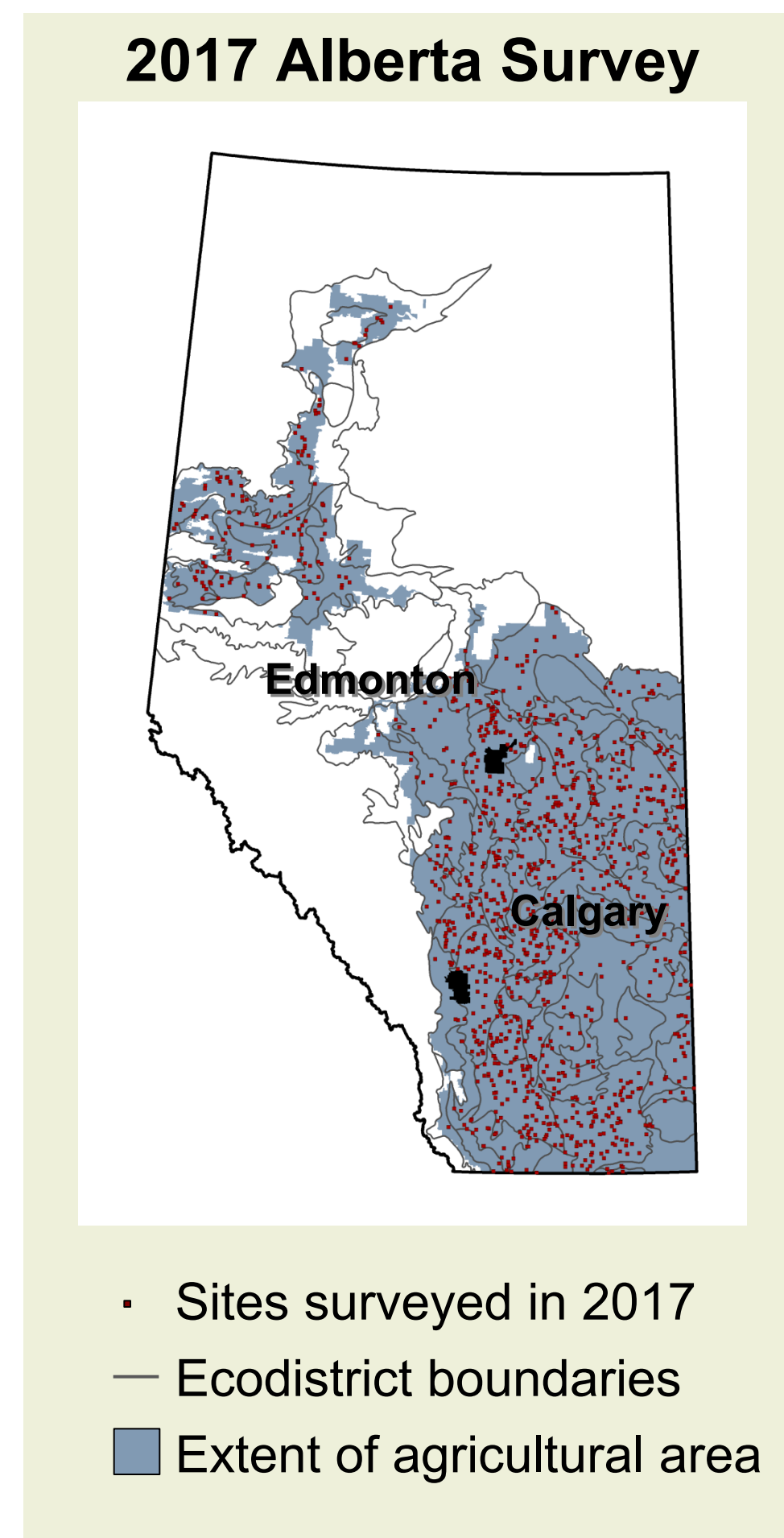
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## Objectives

- Present the top 25 species in the 2017 Alberta provincial weed survey
- Compare the density and relative abundance of weeds in Alberta in 2017 with results from past provincial surveys

## Methods

- Used a stratified random sampling procedure to select fields in ecodistricts shown on map
- Surveyed 1236 fields of canola, spring wheat, durum, barley, oat, peas and lentil
- Counted weeds in 20 quadrats (50 by 50 cm) per field in late summer
- Summarized weed data using a relative abundance index based on frequency, field uniformity and density
- Frequency = Percent of fields in which species occurred
- Uniformity = Percent of quadrats in which species occurred
- Density = Average density of species in all fields
- Compared top 25 species from surveys of:
  - 1333 fields in 2010 (2009-2010)
  - 1153 fields in 2001
  - 684 fields in 1997
  - 1086 fields in 1980's (1987-1989)
  - 3109 fields in 1970's (1973-1977)
- Data weighted based on distribution of surveyed crops in 2011 census
- 2009 irrigated field data down-weighted to reflect the relative area under irrigation



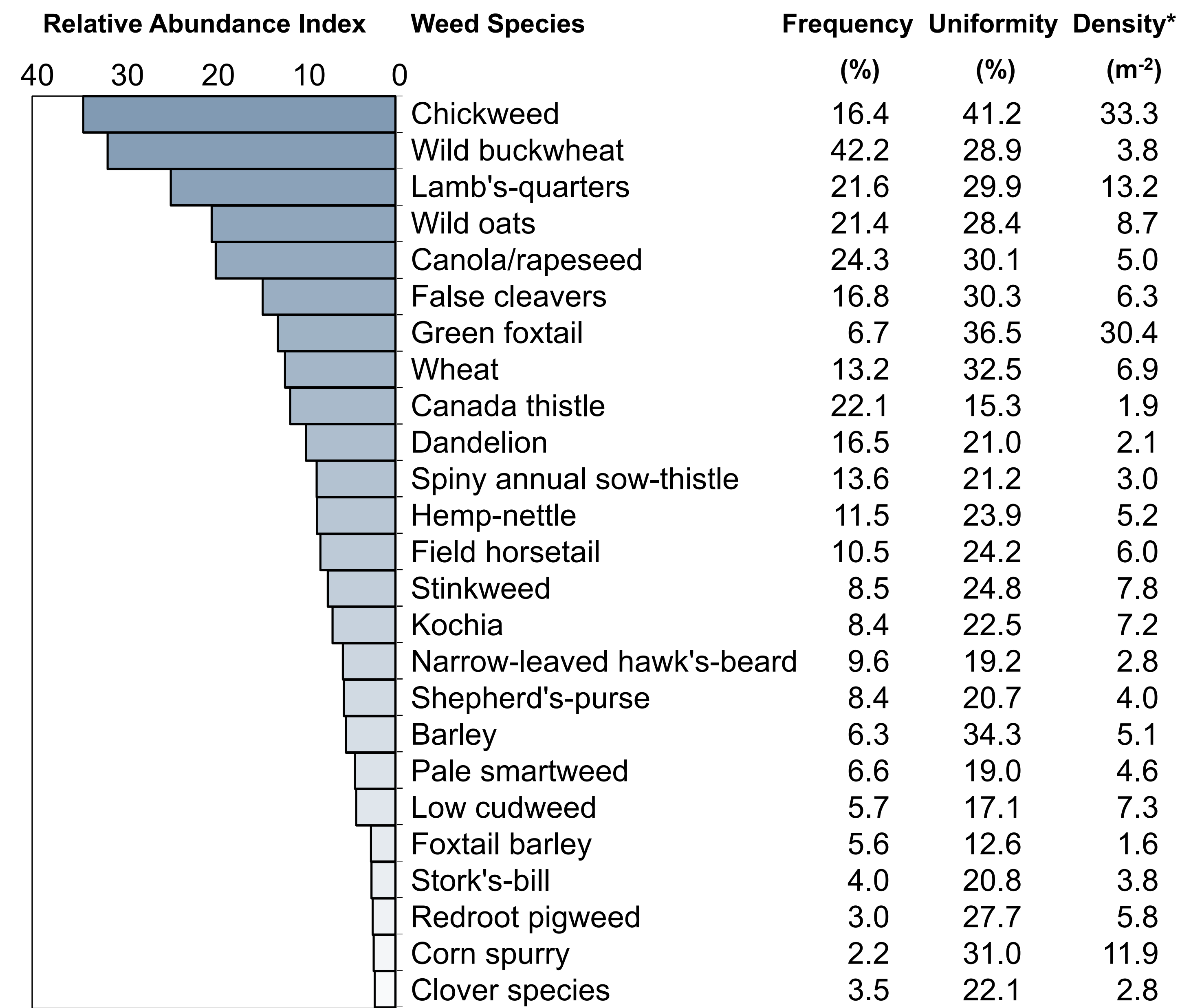
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## Acknowledgements

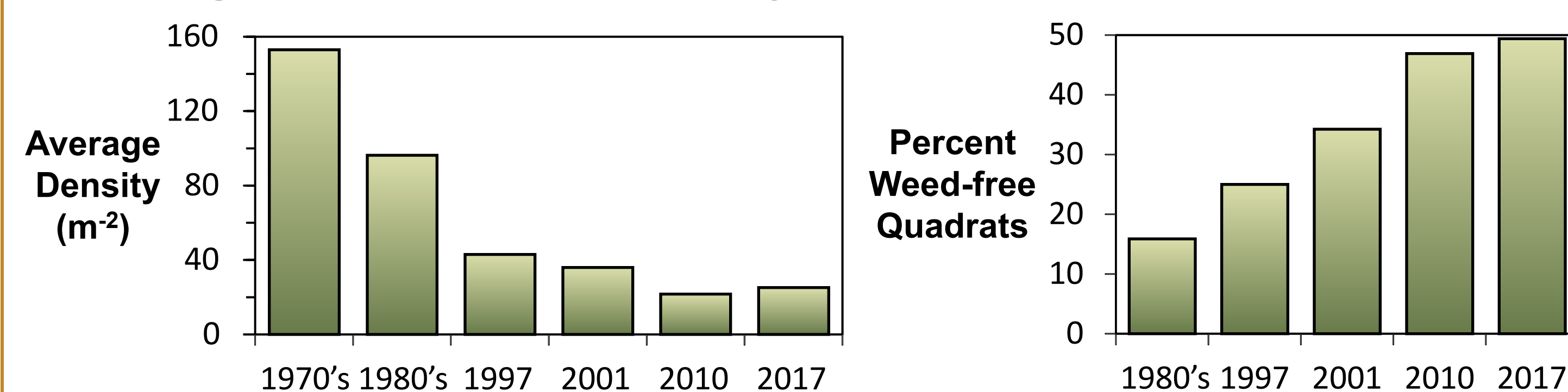
The survey was funded by the: Western Grains Research Foundation, Alberta Wheat Commission, Alberta Pulse Growers Commission, and Alberta Canola Producers Commission. We would like to thank the producers who granted us access to their land to conduct this survey. The survey would not be possible without the assistance of the many individuals who contacted producers, surveyed fields and entered data.

## Top 25 Species in 2017 Survey



\*Average density and uniformity in occurrence fields

## Changes in Total Density and Weed-free Quadrats



## Summary

- The total weed densities in 2010 and 2017 were the lowest recorded
- Chickweed was ranked number one for the first time due, in part, to the high density and uniformity in occurrence fields
- Foxtail barley and stork's-bill have steadily increased over time and appeared in the top twenty-five species for the first time in 2017
- Volunteer wheat, canola and barley ranked higher in 2017 than in past surveys attributable, in part, to crop diversification

## Species Shifts

Weed Species	Relative Abundance Rank						Change
	1970's	1980's	1997	2001	2010	2017	
Foxtail barley		94	39	32	26	21	73*
False cleavers	41	28	8	7	5	6	35
Spiny annual sow-thistle		38	28	13	9	11	27
Low cudweed		45	24	38	15	20	25
Wheat		30	22	22	18	8	22
Stork's-bill	37	32	30	29	28	22	15
Canola/rapeseed	13	19	20	16	6	5	8
Narrow-leaved hawk's-beard	23	15	12	18	12	16	7
Kochia	22	18	23	19	17	15	7
Barley		25	25	26	30	18	7
Chickweed	6	5	2	3	7	1	5
Dandelion	15	20	10	10	4	10	5
Shepherd's-purse	21	9	6	12	16	17	4
Lamb's-quarters	5	7	7	6	8	3	2
Wild buckwheat	3	1	3	1	1	2	1
Field horsetail	14	11	11	14	14	13	1
Canada thistle	9	12	5	4	3	9	0
Wild oats	2	3	1	2	2	4	-2
Green foxtail	4	4	17	8	19	7	-3
Hemp-nettle	8	8	9	9	10	12	-4
Pineappleweed	34	29	19	23	25	40	-6
Quack grass	24	22	16	15	22	31	-7
Clover species		16	27	25	24	25	-9
Perennial sow-thistle	17	17	13	17	13	28	-11
Common groundsel	32	14	14	24	35	43	-11
Pale smartweed	7	10	15	11	23	19	-12
Corn spurry	12	23	21	27	20	24	-12
Stinkweed	1	2	4	5	11	14	-13
Redroot pigweed	10	13	18	21	21	23	-13
Russian thistle	11	6	26	20	27	27	-16
Wild mustard	16	37	45	36	44	41	-25
Flixweed	18	24	32	30	29	51	-33
Cow cockle	25	36	50	41	53	59	-34
Tartary buckwheat	20	27	38	69	33	63	-43
Bluebur	19	21	29	28	42	65	-46

\*Numbers in italics are changes from the 1980's surveys to 2017; these species were not included in the 1970's surveys



**Weeds that have increased the most since the 1970's.**  
Left to right: Foxtail barley, false cleavers, spiny annual sow-thistle, low cudweed, wheat, stork's-bill, canola, narrow-leaved hawk's-beard, kochia, barley, chickweed and dandelion