

SMITH AND BYBEE LAKES RESEARCH PROJECT

INTRODUCTION

This project was undertaken to start a record of the bird use and population in the Smith and Bybee lakes wildlife area. These records will give information on the number of migratory and non-migratory birds that use the park, along with abiotic factors that would effect migration and bird activity. Six categories/species were focused on in the project namely, Warblers, Wrens, Sparrows, Swallows, Ducks, and Wading birds/Others. Explanations of procedure and data will be the body of this report.

PROCEDURE

Observation and recording of birds was done by a volunteer. He traversed the park in a regular pattern while observing. The information was given to Julie Smith at Portland State, then given to the class. The number of birds of each species were totaled for each day then placed on spread sheets to be recounted for accuracy. Some software problems set the project back to the beginning and the totaling and recording started for a second time. Following six to seven recounts and the entering of the data on the spreadsheets dozens of graphs were made to present the information. Analysis of the graphs and brief explanations were completed and prepared for presentation.

INFERENCES

We have 30 graphs that include the number of birds on each date, the cloud cover and the temperature on the days recorded. The graphs are presented to show how many of a certain group of birds (ducks, sparrows, swallows, warblers, wrens, and

others) were seen on each observed day during the period of each season. The seasons are divided as follows. Spring; March 26- June 1, Summer; June 22 - September 15, Fall; September 25 - December 16, Winter; December 24 - March 2. Also included on every graph is the temperature for that day and the amount of cloud cover. This information will help to determine if there is any relationship between the number of birds seen and either the temperature or the cloud cover.

DUCKS

Graph 1 shows how the number of ducks seen throughout the season vary. After studying the graph one will notice that there is only a slight relationship between the number of ducks seen and the temperature. This trend shows that as the weather increases the number of ducks reportedly seen is decreased. The graph also shows a relationship between the ducks and the cloud cover. From March 26 through May 15 it appears that the days with more cloud cover are also the days of which more ducks were seen. This observation, however, is disproved on the 21 of May when the cloud cover increases significantly and the number of ducks remains the same.

Throughout the summer season the number of ducks seen did not appear to be related at all to the temperature or the cloud coverage. (see graph 7) However, during fall (see graph 13) there did appear to be a similar occurrence between the number of ducks seen and the cloud cover. Looking at the graph shows a trend that as when there were more clouds there were also more ducks. This is consistent with the inference made for ducks during the spring season.

Throughout the winter months the ducks seemed to follow cloud coverage with a positive correlation. (see graph 19) Usually when the cloud cover was higher so

were the number of ducks. The temperature also seemed to have a positive correlation with the ducks. For example on the day in which the temperature was the lowest so was the number of ducks counted.

When comparing the number of ducks seen to cloud coverage it seems that there might possibly be a slight relationship. In three out of the four seasons a positive correlation was noted between the two.

While comparing the temperature to the ducks' numbers, however, no relationship was observed. The two seasons that did find some sort of correlation were noted to be in opposition.

Looking at the ducks throughout the year (see graphs 1, 7, 13, and 19) it seems as though there are more ducks from late fall to early winter. The numbers then drop in mid-winter. This suggests that ducks are migratory birds.

Sparrows

Throughout the year the number of sparrows remained consistently low (see graphs 2, 8, 14, and 20). The numbers never reached above 45. They also did not fluctuate much during the course of the year. The time when the fewest numbers of sparrows were seen, was from late summer until early fall.

In the spring it seems as though there was a relationship between the cloud coverage and the amount of sparrows observed (see graph 2). The trend seems to be that on every day, with the exception of May 7, the more clouds that were observed the more these birds were seen. There does not appear to be a relationship between the numbers and the temperature.

The sparrow count does not follow cloud cover in the summer (see graph 8). However, there may be some correlation between the sparrows' numbers

and the temperature. While not an exact match, neither temperature or the number of sparrows varies dramatically during the summer months.

Throughout the fall the number of sparrows is at its' lowest (see graph 14). There is no relationship between the sparrows and the temperature nor the cloud cover. Also, during the winter, when looking at both cloud cover and temperature for the days recorded there is no obvious correlation. They do not seem to follow any weather patterns.

Swallows

Looking at the pattern of the swallows throughout the course of the year (see graphs 3, 9, 15, and 21) It is strongly suggestive that these birds migrate to some place warmer from early fall until late winter. It is during these times in which the birds were seen on very few occasions.

During the spring months there seemed to be a relationship between both the temperature and the cloud cover (see graph 3). Throughout spring it seems that as the clouds increase, so do the number of swallows. It also appears that as the temperature grows the swallows' numbers do the same. Once again the only day in which this trend does not fit is ^{May 7} ~~the 7 of May~~. On this day the cloud cover dropped dramatically while the bird number remained constant.

In the summer the swallows appear not to be affected by either the temperature or the cloud cover (see graph 9). Throughout fall and winter the number of

swallows is close to zero. It is during this time that a migration period is suggest by both graphs (see graphs 15 and 21).

WARBLERS

Throughout the whole year the number of warblers never raises above 30 (see graphs 4, 10, 16, and 22). It is in the spring in which these birds reach this number. Come late fall the warblers are not seen at all until late winter / early spring. It is during this time that one may infer that the birds have migrated to a warmer climate.

During the spring there is a positive correlation between the number of warblers seen and the cloud cover (see graph 4). On the seventh, however, the cloud cover dropped, yet the number of warblers increased slightly. This happened to all bird types of which there was thought to be a relationship between the number of birds seen and the cloud cover. One could possibly infer that the number of birds is not very dependent on the cloud cover.

In the months of summer the warblers do not seem affected by cloud cover (see graph 10). They do appear, at least loosely, to be affected by daily temperature changes. The high temperature and increased warbler sightings occurred on the same day. While the temperature fluctuated more than bird numbers, the number of warblers does seem to follow the temperature pattern.

In fall and winter the warbler numbers go down significantly. It is during this time that one may conclude that the birds are migrating. Therefore the birds are obviously affected by the temperature. They disliked it so much that they decided to find a warmer climate to dwell during these cold months.

WRENS

The number of wrens stays consistently low throughout the entire year. There was never a day in which more than ten of them were sighted (see graphs 5, 11, 17, and 23). This information shows that the wrens are not migratory. No inferences could be drawn about the wrens correlating with cloud coverage or temperature.

SMITH AND BYBEE LAKE BIRD CONCLUSIONS

While recognizing there are many possible sources for error and few definitive conclusions which can be inferred, one fact became very clear in our study of the bird use data: birds do use this sanctuary. In fact, on any given day over 1,400 birds were counted as present in the park (see graph 26). After breaking the bird data down seasonally, it also became apparent that some of the birds are migratory. It is likely that many bird species use Smith and Bybee Lakes as a stop over point in there migration (see graph 25). However, Smith and Bybee Lakes are in use year round by some bird species. At all times, the lakes are in use by multiple bird species (see graph 25).

Our study primarily focused on drawing conclusions based on bird data versus temperature, cloud cover, and season. This data is first year data and we anticipate

that it will be used as a foundation to compare against in future years. We see this as an ongoing work in progress. Since this is first year data, there were few conclusion we could draw. However, after the dam removal at Smith and Bybee Lakes, we believe our work will be a valuable source of information to compare against.

Nonetheless, our work has many possible sources of error. There are possible errors in field counting process and in our data analysis. Since the counts were completed by only one person, there is no verification process. The counts were completed by sight and thus must be estimations. And some data was not collected constantly, nor were all data collection days consistent. There are possible errors in our data analysis as well. Although we made every effort to verify and re-verify our data and our totals, errors are possible. Even the interpretation of the hand written raw data bird counts is a possible source for error. Also our collective lack of experience with birds and bird data prevented us from being able to draw further conclusions. And there may even be bird misclassifications within the categories of Ducks, Sparrows, Swallows, Warblers, Wrens, and the remaining Others that don't fit these previous categories. But while there are numerable sources for error, we put much effort into maintaining project integrity.

While we anticipate the more telling conclusions will come in the future, it is clear Smith and Bybee Lakes is used by birds year round.

Date	QUARTER I SPRING											Total	
	3-26	4-3	4-10	4-18	4-24	5-2	5-7	5-15	5-21	5-28	6-1		
Temp.	47	49	55	55	40	42	42	76	50	62	55		
Clds.	100%	100%	50%	100%	90%	50%	0	15%	90%	100%	50%		
Wind	Sli.	0	Sli.	0	0	0	Mod.	0	0	0	0		
Time (start)	7:15	7:15	6:30	6:00	7:45	7:30	4:30	6:30	7:30	7:30	8:00		
Time Duration (min)													
Rain	100%	Rain	0	Light	0	0	0	0	0	100%	0		
Species	Abrev.												Total
Ducks													
Canada Goose	CAN	9	61	2	4	17	10	4	5	4	1		117
Mallard	MALL	8	9	8		12	6	5	3	4	3	1	59
Northern Shoveler	SHOV	15	6										21
American Wigeon	WIG				12	6							18
Wood Duck	WD	2		2			2	2			3		11
Lesser Scaup	LSCA		10										10
Canvasback	CB											8	8
Ring-Necked Duck			4										4
Gadwall	GAD	3											3
Green-winged Teal	GWT	2											2
Bufflehead	BUFF												
Common Merganser	CMER												
Northern Pintail													
Total Ducks per Day		39	90	12	16	35	18	11	8	8	7	9	253
Sparrows													
Song Sparrow	SS	8	15	11	10	19	12	9	11	20	10	17	142
Golden-crowned Sparrow	GCS				5			6					11
House Sparrow	HS	1				3	2			4			10
Spotted Towhee	ST	1									1	3	5
Fox Sparrow	FOXS		1			2							3
Dark-eyed Junco			2										2
Savanna Sparrow							1						1
White Crowned Sparrow		1											1
Total Sparrows per Day		11	18	11	15	24	15	15	11	24	11	20	175
Swallows													
Tree Swallow	TSW	20	40	3	20	6	7	11	2	11	3	2	125
Barn Swallow	BSW					1		2	2		1	4	10
Violet-Green Swallow	VGSW												
Total Swallows per Day		20	40	3	20	7	7	13	4	11	4	6	135
Warblers													
Yellow Rumped Warbler	YRW	10	12	3	25	23	3	5					81
Yellow Warbler	YW							4	5	11	4	7	31
Common Yellowthroat	CYT			2	2	4	3	1	1	2	2	2	19
Wilson Warbler	WWA									2			2
B-Throated Gray Warbler													
Orange-crowned Warbler	OCWA												
Total Warblers per Day		10	12	5	27	27	6	10	6	15	6	9	133
Wrens													
Bewick's Wren	BW	4	2	2	3	2	1	1		3	1	2	21
House Wren	HW					1	2		1	1	1	5	11
Winter Wren	WW						1						1
Total Wrens per Day		4	2	2	3	3	4	1	1	4	2	7	33
All Others													
American Coot	COOT	80	35	2	25	8							150
Brewer's Blackbird	BBB	150											150
American Robin	ROB	12	10	12	5	15	14	11	5	10	8	6	108
European Starling	STAR	10	7	15	3	3	4	3	5	9	5	5	69
Cedar Waxwing	CWW		22					1	20	13	8	4	68
Red-winged Blackbird	RWBB	2	33	5	6	4	2	2	3	4	3	2	66
House Finch	HF	4	6	8	3	5	4	3	8	9	5	5	60
American Crow	CROW	1	3	25	3	1		2	2	2	1		40
Brown-Headed Cowbird	COWB					7	7	1	3	7	13		38
Mourning Dove	MD	4	4		8	3	3	2	4	4	1	2	35
Red-tailed Hawk	RTH	1	4	2	1	6	2	3	2	3	2	2	28

Duck
Nicks

American Goldfinch	GF		1			2	16					8	27
Gold Finch								6	4	8	8		26
Bush Tit	BTTT		2	2	3	3	3	4	4		4	3	25
Black-Capped Chickadee	BCC	1	3	3	2	3	1	2	3	4	1	2	25
Great Blue Heron	GBH	3	5		1	1	2	3	1	4	1	3	24
Western Tanager	WTAN							14	2	3			19
Brown Creeper	BC	1	1	1	3	1	3	1	1		4	2	18
Northern Flicker	FLKR	2	5		1	1	1	1	1	4			16
Balck-Headed Grosbeak	BHGB							1	1	6	4	1	13
Downy Woodpecker	DWP		3				1			1	2	4	11
Fuax Swift	VS				1		2		5		1	1	10
Double Crested Cormorant	COR	1	1	4	2	1							9
Western-wood Peewee	WWPW									2	2	4	8
Scrub Jay	SJ	1	1			1	3	1			1		8
Ruby-Crowned Kinglet	RCK	3	2	1	2								8
Great Horned Owl	GHO						3		2		1		6
Cotton Tail			2	1			1			1			5
Osprey	OSP	2							1	1			4
Northern Oriole	NO								1		1	1	3
Willow Flycatcher	WIFC											3	3
Killdeer	KILL			1			1				1		3
Belted Kingfisher			2							1			3
Bald Eagle	BE								2				2
Anna's Hummingbird	AHUMM							1	1				2
Olive-sided Flycatcher	OSFC									1		1	2
Turkey Vulture	TV						1					1	2
Glauous-winged Gull	GWG				1								1
Rufous-sided Hummingbird	HUMM											1	1
Swainson's Thrush	STH									1			1
Western Flycatcher	WFC											1	1
Hermit Thrush		1											1
Virginia Rail	VRAIL												
Cliff Swallow	CSW												
Gold Crowned Kinglet	GCK												
Hooded Merganser	HMER												
Pied-bill Grebe	PBGR												
Ringed-bill Gull	RBG												
Rock Dove													
Rock Pigeon	RP												
Snipe	SNIFE												
Spotted Sandpiper	SSAND												
Steller's Jay													
Warbling Vireo	WARVIR												
Willet	WILL												
Beaver						1							1
Total Others per Day		277	150	83	70	66	71	65	81	98	77	62	1100
Total Ducks per Day		39	90	12	16	35	18	11	8	8	7	9	253
Total Sparrows per Day		11	18	11	15	24	15	15	11	24	11	20	175
Total Swallows per Day		20	40	3	20	7	7	13	4	11	4	6	135
Total Warbers per Day		10	12	5	27	27	6	10	6	15	6	9	133
Total Wrens per Day		4	2	2	3	3	4	1	1	4	2	7	33
Grand Total Spring		361	312	116	151	162	121	115	111	160	107	113	1829

Total all others in spring

		QUARTER II SUMMER												
Date		6-22	7-1	7-9	7-18	7-22	7-29	8-12	8-20	8-28	9-5	9-10	9-15	
Temp.		60	60	58	57	55	60	74	70	60	60	62	60	
Clds.		100%	100%	100%	20%	100%	50%	0%	100%	100%	75%	100%	100%	
Wind		0	0	Mod.	0	Sli.	Mod.	Sli.	0	0	0	0	Sli.	
Time (start)		7:30	7:30	7:30	7:30	7:30	7:30	7:15	7:50	7:50	7:15	7:30	7:30	
Time Duration (min)														
Rain		0	100%	0	100%	100%	100%	0	100%	100%	0	75%	100%	
Species	Abrev.													Total
Ducks														
Mallard	MALL	2			3	14	4	22	10	3	35	40	1	134
Wood Duck	WD	1		1		4	5				2			13
Canada Goose	CAN					8		2	1					11
Green-winged Teal	GWT												6	6
American Wigeon	WIG												4	4
Bufflehead	BUFF													
Canvasback														
Common Merganser	CMER													
Gadwall	GAD													
Lesser Scaup	LSCA													
Northern Pintail														
Northern Shoveler	SHOV													
Total Ducks per Day		3	0	1	3	26	9	24	11	3	37	40	11	168
Sparrows														
Song Sparrow	SS	16	12	9	12	32	12	16	8	2	10	3	8	140
Spotted Towhee	ST		1	1	1	5	2	2						12
House Sparrow	HS	1			1	2	2	1						7
Fox Sparrow	FOXS	1							1					2
Dark-eyed Junco														
Golden-crowned Sparrow	GCS													
Savanna Sparrow														
White Crowned Sparrow														
Total Sparrows per Day		18	13	10	14	39	16	19	9	2	10	3	8	161
Swallows														
Barn Swallow	BSW	7	6	5	12	20	3	4	6	5	3	3	70	144
Tree Swallow	TSW	6	2	4	12	2								26
Violet-Green Swallow	VGSW			1		1							3	5
Total Swallows per Day		13	8	10	24	23	3	4	6	5	3	3	73	175
Warblers														
Yellow Warbler	YW	5	4	5	1	4	5	8						32
Common Yellowthroat	CYT	1			3	3		3	1	3	3	2	3	22
Wilson Warbler	WWA						1							1
B-Throated Gray Warbler														
Orange-crowned Warbler	OCWA													
Yellow Rumped Warbler	YRW													
Total Warblers per Day		6	4	5	4	7	6	11	1	3	3	2	3	55
Wrens														
House Wren	HW	5	6	2	2	4	2	5		1	1			28
Bewick's Wren	BW	3	1			1	3	3	1		5	2	3	22
Winter Wren	WW													
Total Wrens per Day		8	7	2	2	5	5	8	1	1	6	2	3	50
All Others														
European Starling	STAR	3	7		21	80	30	33	5	2	4	50	4	239
American Robin	ROB	12	12	3	11	25	12	11	14	3	4	1		108
Cedar Waxwing	CWW	3	3		12	5	3	3			25		3	57
Black-Capped Chickadee	BCC	1	1	2	2	10	4	3	5		7	1	4	40
Western-wood Peewee	WWPW	5	2	3	3	6	3	5	4	2	2			35
Great Blue Heron	GBH	2	4	1	2	2	2	5	5	2	7	1	1	34
House Finch	HF	6	5	4	3	9	4	2	1					34
Downy Woodpecker	DWP	2	10		3	3	2	2	1		4		2	29
Bush Tit	BTIT	2	4		13	10								29
Brown-Headed Cowbird	COWB	5	5	5	5	7	1							28
American Goldfinch	GF	5	5	2		3	1		1		5			22
Fuax Swift	VS	4	1	4	2	3	4				2		1	21

Total ducks in summer

Total sparrows in summer

Total swallows in summer

Total warblers in summer

Total wrens in summer

Killdeer	KILL		2	2	2	2	1	6	3		2		1	21
Red-tailed Hawk	RTH	2	2	2	3	2	3	1			1	2	1	19
Northern Flicker	FLKR	1			1	4	2		1	1	2		1	13
Brown Creeper	BC	4	1	1		2	1	2	1				1	13
Willow Flycatcher	WIFC	1	7				4	1						13
American Crow	CROW	1	1			3		2	3	1			1	12
Double Crested Cormorant	COR	1		2			1			2		4	1	11
Scrub Jay	SJ	1				1	1		1	1	2	2	2	11
Belted Kingfisher						1		1	1	1	3	1	2	10
Cliff Swallow	CSW	1	3		4		2							10
Balck-Headed Grosbeak	BHGB	5	1		1	2								9
Northern Oriole	NO	1	1	2		2	2							8
Western Flycatcher	WFC			2	1	2					2			7
Mourning Dove	MD	2				2	1		2					7
Spotted Sandpiper	SSAND					2		1				1	1	5
Rock Pigeon	RP						1	2						3
Ringed-bill Gull	RBG					1	1						1	3
Western Tanager	WTAN		3											3
Willet	WILL										2		1	3
Red-winged Blackbird	RWBB	1	1											2
Steller's Jay											2			2
Osprey	OSP							1						1
Rufous-sided Hummingbird	HUMM									1				1
Virginia Rail	VRAIL	1												1
Gold Finch														
American Coot	COOT													
Anna's Hummingbird	AHUMM													
Bald Eagle	BE													
Brewer's Blackbird	BBB													
Glauous-winged Gull	GWG													
Gold Crowned Kinglet	GCK													
Great Horned Owl	GHO													
Hermit Thrush														
Hooded Merganser	HMER													
Olive-sided Flycatcher	OSFC													
Pied-bill Grebe	PBGR													
Rock Dove														
Ruby-Crowned Kinglet	RCK													
Snipe	SNIPE													
Swainson's Thrush	STH													
Turkey Vulture	TV													
Warbling Vireo	WARVIR													
Cotton Tail														
Beaver														
Total others per Day		72	81	35	89	189	86	81	48	16	76	63	28	864
Total Ducks per Day		3	0	1	3	26	9	24	11	3	37	40	11	168
Total Sparrows per Day		18	13	10	14	39	16	19	9	2	10	3	8	161
Total Swallows per Day		13	8	10	24	23	3	4	6	5	3	3	73	175
Total Warblers per Day		6	4	5	4	7	6	11	1	3	3	2	3	55
Total Wrens per Day		8	7	2	2	5	5	8	1	1	6	2	3	50
Grand Total Summer		120	113	63	136	289	125	147	76	30	135	113	126	1473

Total others in summer

		QUARTER III FALL											
Date		9-25	10-1	10-9	10-17	10-31	11-4	11-12	11-20	11-28	12-11	12-16	
Temp.		60	55	47		55	58	48	42	49	39	40	
Clds.		Fog	100%	100%		50%	0%	100%	100%	100%	30%	100%	
Wind		0	Wind	Str.		0	0	Sli.	Mod.	0	0	Mod.	
Time (start)		7:15	7:30	7:30	7:15	7:15	7:15	7:15	7:15	7:15	7:00	7:15	
Time Duration (min)													
Rain		0	100%	0		100%	100%	0	100%	0	0	100%	
Species	Abrev.												Total
Ducks													
Canada Goose	CAN				18	528	15	2	162	63	62	651	1501
Northern Shoveler	SHOV							2	1	2	11	460	476
Mallard	MALL	3	35	20	1	25	20	25	30	20	10		189
American Wigeon	WIG			5	1	20	2	2	5	1	4		40
Lesser Scaup	LSCA								22	10			32
Green-winged Teal	GWT		3		1	5	7	5		1	10		32
Bufflehead	BUFF						3	1	3	2	2	10	21
Common Merganser	CMER								10		6	2	18
Wood Duck	WD		6	9									15
Gadwall	GAD			5	1	2	3	2		2			15
Ring-neck Duck	RND							3	3				6
Northern Pintail													
Canvasback													
Total Ducks per Day		3	44	39	22	580	50	42	236	101	105	1123	2345
Sparrows													
Song Sparrow	SS	9	2	2	10	2	8	2	3	2	18	7	65
Golden-crowned Sparrow	GCS				3			2			4		9
House Sparrow	HS					6		2					8
Spotted Towhee	ST		1		2		2	2			1		8
Dark-eyed Junco					2		1	1					4
Savanna Sparrow													
White Crowned Sparrow													
Fox Sparrow	FOXS												
Total Sparrows per Day		9	3	2	17	8	11	9	3	2	23	7	94
Swallows													
Barn Swallow	BSW		4	100									104
Violet-Green Swallow	VGSW			10									10
Tree Swallow	TSW												
Total Swallows per Day		0	4	110	0	0	0	0	0	0	0	0	114
Warblers													
Yellow Rumped Warbler	YRW	6	5		3	10	10	5					39
Orange-crowned Warbler	OCWA		2										2
Common Yellowthroat	CYT		1										1
Wilson Warbler	WWA												
Yellow Warbler	YW												
B-Throated Gray Warbler													
Total Warblers per Day		6	8	0	3	10	10	5	0	0	0	0	42
Wrens													
Bewick's Wren	BW	5	2		5	2	4	1		3	2	2	26
House Wren	HW		1					1					2
Winter Wren	WW							1					1
Total Wrens per Day		5	3	0	5	2	4	3	0	3	2	2	29
All Others													
American Crow	CROW	8	2	10	50	2	14	7	2	16	222	80	413
Double Crested Cormorant	COR	4	10	50	5	5	10	25	2	24	17	8	160
European Starling	STAR	6	10	20	25	4	12	10	39	5	6	5	142
American Coot	COOT				3		10	5	43	6	25	35	127
Brewer's Blackbird	BBB											100	100
American Robin	ROB	2	1	3	1	1	5		16	2	17	25	73
Black-Capped Chickadee	BCC	2	4	2	2	3	6	3	1	5	15	6	49
Cedar Waxwing	CWW	38	5	2									45
Rock Pigeon	RP					1	12		30				43
Cotton Tail						40							40
Ruby-Crowned Kinglet	RCK				4	3	5	6	4	2	10	3	37

Total

Total ducks in fall

Total sparrows in fall

Total swallows in fall

Total warblers in fall

Total wrens in fall

Rock Dove	RD							35		1		1	37
Gold-crowned Kinglet	GCK						1	2		2	3	5	13
Ringed-bill Gull	RBG	2	3	2	1	6		5	1	1	7	3	31
Glaucous-winged Gull	GWG						9	1		5	8	7	30
Great Blue Heron	GBH		1	2	4	2	7	1	1	2	4	3	27
Downy Woodpecker	DWP	1	2		5	3	2	2			3		18
Mourning Dove	MD	3	2	1	6		2			1		3	18
Red-tailed Hawk	RTH		2	1	3	1	1	3	3		1	2	17
Red-winged Blackbird	RWBB	1	1		3		1			6	3		15
Northern Flicker	FLKR	2	3	1	3	2	1				2		14
Bush Tit	BTTT				10	2		2					14
Hooded Merganser	HMER						1	3	8		2		14
Belted Kingfisher			1	2	1	1	2	1	1	2	1	2	14
Fuax Swift	VS		12										12
Brown Creeper	BC	1	1		2			1		2	1	2	10
Scrub Jay	SJ				1	2		2	1	1			7
Snipe	SNPE		6										6
House Finch	HF					2	1			2			5
Pied-bill Grebe	PBGR							1	1			1	3
Swainson's Thrush	STH		3										3
American Goldfinch	GF		2										2
Bald Eagle	BE						1			1			2
Osprey	OSP	1											1
Warbling Vireo	WARVIR		1										1
Virginia Rail	VRAIL												
Anna's Hummingbird	AHUMM												
Black-Headed Grosbeak	BHGB												
Brown-Headed Cowbird	COWB												
Cliff Swallow	CSW												
Gold Finch													
Great Horned Owl	GHO												
Hermit Thrush													
Killdeer	KILL												
Northern Oriole	NO												
Olive-sided Flycatcher	OSFC												
Rufous-sided Hummingbird	HUMM												
Spotted Sandpiper	SSAND												
Steller's Jay													
Turkey Vulture	TV												
Western Flycatcher	WFC												
Western Tanager	WTAN												
Western-wood Peewee	WWPW												
Willet	WILL												
Willow Flycatcher	WIFC												
Beaver													
Total Others per Day		71	72	96	129	80	103	115	153	86	347	291	1543
Total Ducks per Day		3	44	39	22	580	50	42	236	101	105	1123	2345
Total Sparrows per Day		9	3	2	17	8	11	9	3	2	23	7	94
Total Swallows per Day		0	4	110	0	0	0	0	0	0	0	0	114
Total Warblers per Day		6	8	0	3	10	10	5	0	0	0	0	42
Total Wrens per Day		5	3	0	5	2	4	3	0	3	2	2	29
Grand Total Fall		94	134	247	176	680	178	174	392	192	477	1423	4167

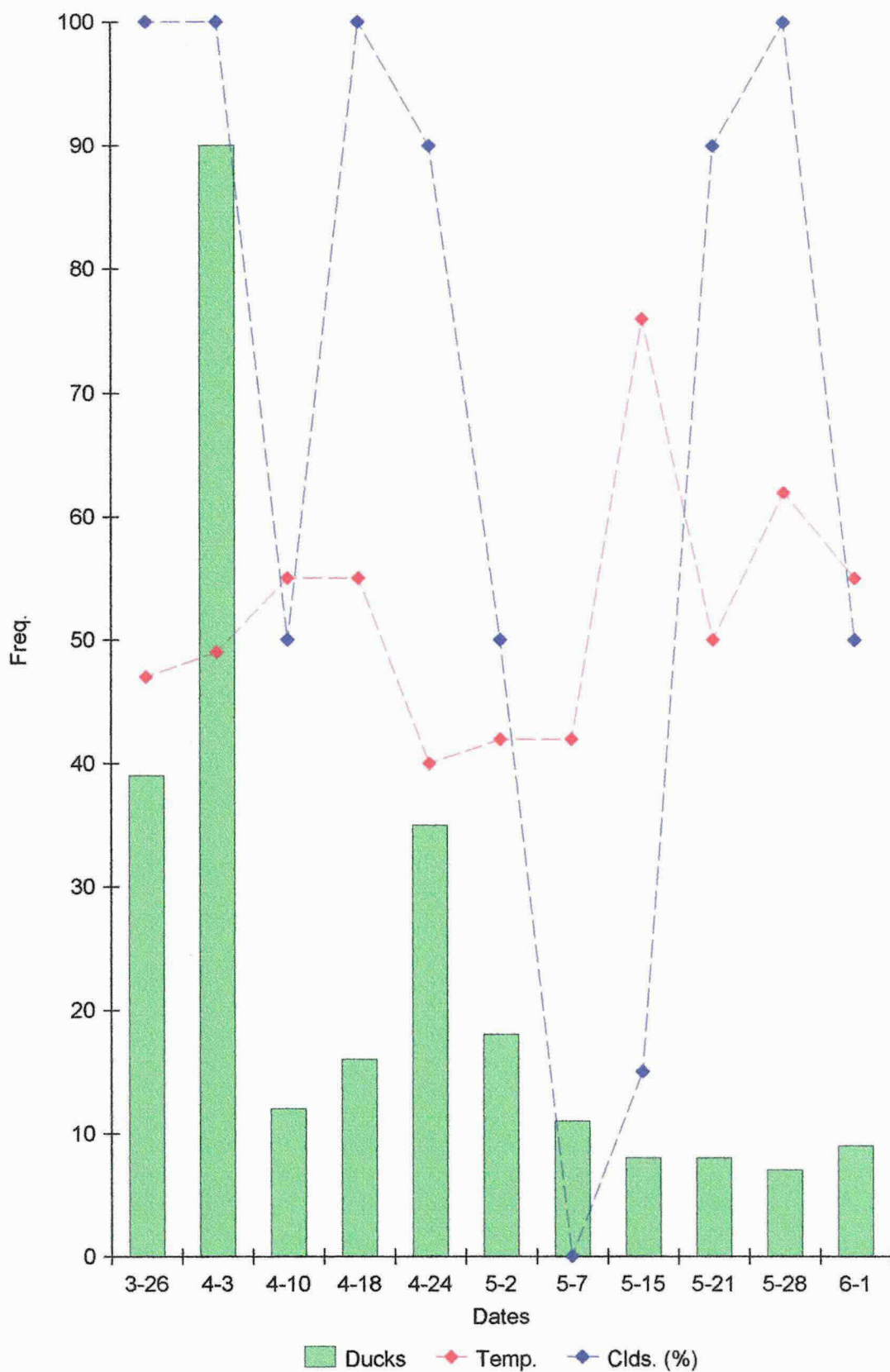
Total others in fall

Date	QUARTER IV WINTER									Total	
	12-24	12-31	1-8	1-19	1-27	2-4	2-12	2-20	3-2		
Temp.	38	39	29	36	44	48	45	45			
Clds.	40%	100%		50%	100%	100%	100%	100%	50%		
Wind	0	TRA.	0	MOD	0	0	0	SLI.	0		
Time (start)	7:15	7:30	7:15	7:15	7:15	7:15	7:15	7:15	7:15		
Time Duration (min)						110	120				
Rain	0%	0%	0%	0%	100%	0%	100%				
Species	Abrev.										Total
Ducks											
Lesser Scaup	LSCA		150						500	4	654
Canada Goose	CAN	220	75	2	4	30	9	3	21	3	367
Northern Shoveler	SHOV	30	102		5	1	43	23	30	50	284
Mallard	MALL	21	42	22	32	10	4	35	20	10	196
Bufflehead	BUFF	5	1	3	32	10	3				54
Green-winged Teal	GWT		10			7			2		19
Gadwall	GAD	3	3	1	6	4	2				19
Common Merganser	CMER	10			2						12
American Wigeon	WIG		2								2
Northern Pintail				1			1				2
Wood Duck	WD										
Canvasback											
Total Ducks per Day		289	385	29	81	62	62	61	573	67	1609
Sparrows											
Song Sparrow	SS	8	9	6	14	27	18	7	11	9	109
Dark-eyed Junco			4	20			10				34
Golden-crowned Sparrow	GCS			2		6					8
Spotted Towhee	ST	2	1	1		1	1				6
House Sparrow	HS		2		2						5
Savanna Sparrow										1	1
White Crowned Sparrow											
Fox Sparrow	FOXS										
Total Sparrows per Day		10	16	29	16	34	29	7	11	11	163
Swallows											
Tree Swallow	TSW									3	3
Violet-Green Swallow	VGSW										
Barn Swallow	BSW										
Total Swallows per Day		0	0	0	0	0	0	0	0	3	3
Warblers											
Yellow Rumped Warbler	YRW				1			1	3	2	7
B-Throated Gray Warbler									3		3
Wilson Warbler	WWA										
Orange-crowned Warbler	OCWA										
Yellow Warbler	YW										
Common Yellowthroat	CYT										
Total Warblers per Day		0	0	0	1	0	0	1	6	2	10
Wrens											
Bewick's Wren	BW	3	3	4	7	5	5	1	2	2	32
Winter Wren			1		1						2
House Wren	HW										
Total Wrens per Day		3	4	4	8	5	5	1	2	2	34
All Others											
Brewer's Blackbird	BBB	150	300								450
European Starling	STAR	14	29	4	95	13	24	18	5	17	219
American Coot	COOT	13	35	5	10	7	24	50	16	24	184
American Robin	ROB	5	2	1	10	35	18	8	28	15	122
American Crow	CROW		22	3	6	14	25	33	1	5	109
Mourning Dove	MD	13			1			1	50	9	74
Double Crested Cormorant	COR	11	7	4	7	7	9	11	5	3	64
Black-Capped Chickadee	BCC	5	10	5	9	11	5	5	4	2	56
Ruby-Crowned Kinglet	RCK	15	8	5	4	7	1	2	6	3	51
Glaucous-winged Gull	GWG	19	15	7	2	1	3	2			49
House Finch	HF		1		1	1	1		27	9	40
Great Blue Heron	GBH	4	3		4	2	2	2	8	1	26

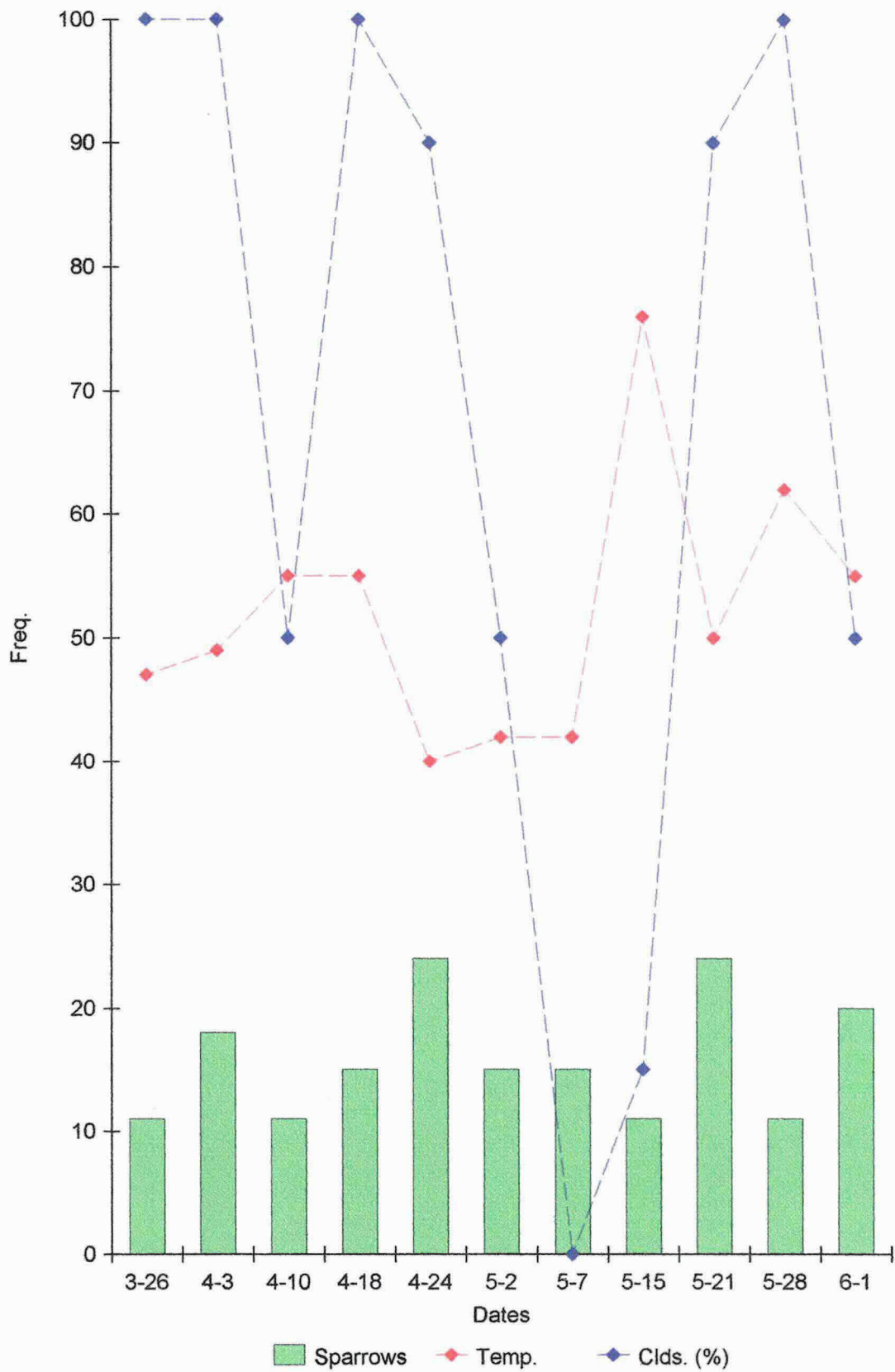
Northern Flicker	FLKR	2	3	1	2	7	3	1	5	2	26
Rock Pigeon	RP		12				8				20
Red-tailed Hawk	RTH	2	1	1	2	2	2	3	5	2	20
Brown Creeper	BC	5	2	1	2	2	3	1	1	2	19
Belted Kingfisher	KING	2	3	4	1	2	4	1	1	1	19
Bald Eagle	BE	1	1		3	3	2	2	1	1	14
Downy Woodpecker	DWP	3	2	3		1	1		1	2	13
Red-winged Blackbird	RWBB		3	1	1	3	1	1	1	1	12
Scrub Jay	SJ		2	1	2	1	1		1	3	11
Rock Dove									8	3	11
Gold Crowned Kinglet	GCK	3	3	2		1				1	10
Ringed-bill Gull	RBG	1		1	4	1			2		9
Pied-bill Grebe	PBGR	1	2	1			4	1			9
Hermit Thrush	HTH	1		1	1		1			2	6
Great Horned Owl	GHO	2				1	2				5
Bush Tit	BTIT		2			1				1	4
Cedar Waxwing	CWW									3	3
Hooded Merganser	HMER				2						2
Great Egret	GEg.				1						1
Virginia Rail	VRAIL										
American Goldfinch	GF										
Anna's Hummingbird	AHUMM										
Black-Headed Grosbeak	BHGB										
Brown-Headed Cowbird	COWB										
Cliff Swallow	CSW										
Fuax Swift	VS										
Gold Finch											
Killdeer	KILL										
Northern Oriole	NO										
Olive-sided Flycatcher	OSFC										
Osprey	OSP										
Rufous-sided Hummingbird	HUMM										
Snipe	SNIFE										
Spotted Sandpiper	SSAND										
Steller's Jay											
Swainson's Thrush	STH										
Turkey Vulture	TV										
Warbling Vireo	WARVIR										
Western Flycatcher	WFC										
Western Tanager	WTAN										
Western-wood Peewee	WWPW										
Willet	WILL										
Willow Flycatcher	WIFC										
Cotton Tail											
Beaver											
Total Other per Day		272	468	51	170	123	144	142	176	112	1658
Total Ducks per Day		289	385	29	81	62	62	61	573	67	1609
Total Sparrows per Day		10	16	29	16	34	29	7	11	11	163
Total Swallows per Day		0	0	0	0	0	0	0	0	3	3
Total Warblers per Day		0	0	0	1	0	0	1	6	2	10
Total Wrens per Day		3	4	4	8	5	5	1	2	2	34
Grand Total Winter		574	873	113	276	224	240	212	768	197	3477

Total others in winter

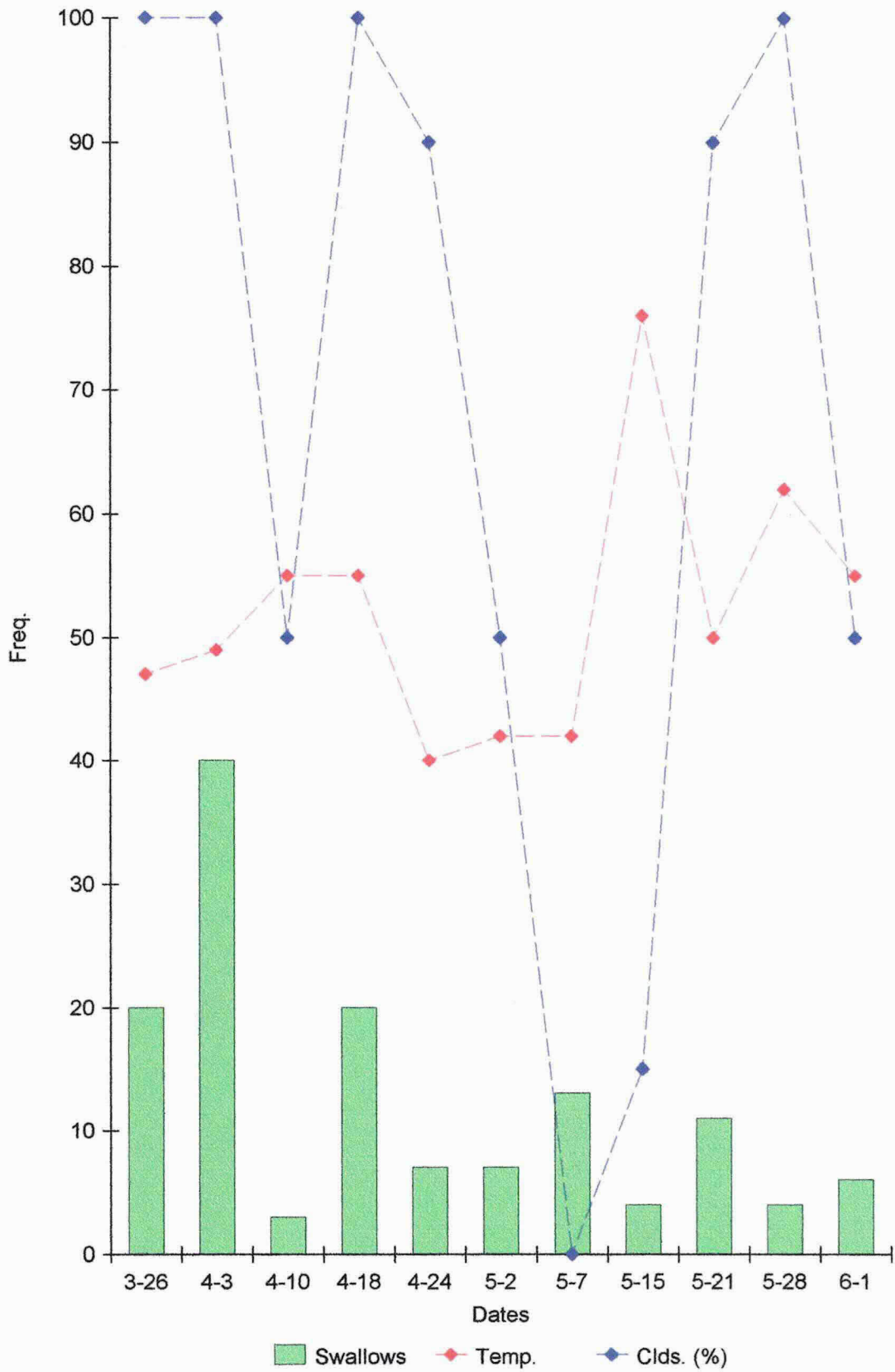
Ducks In Spring (graph 1)



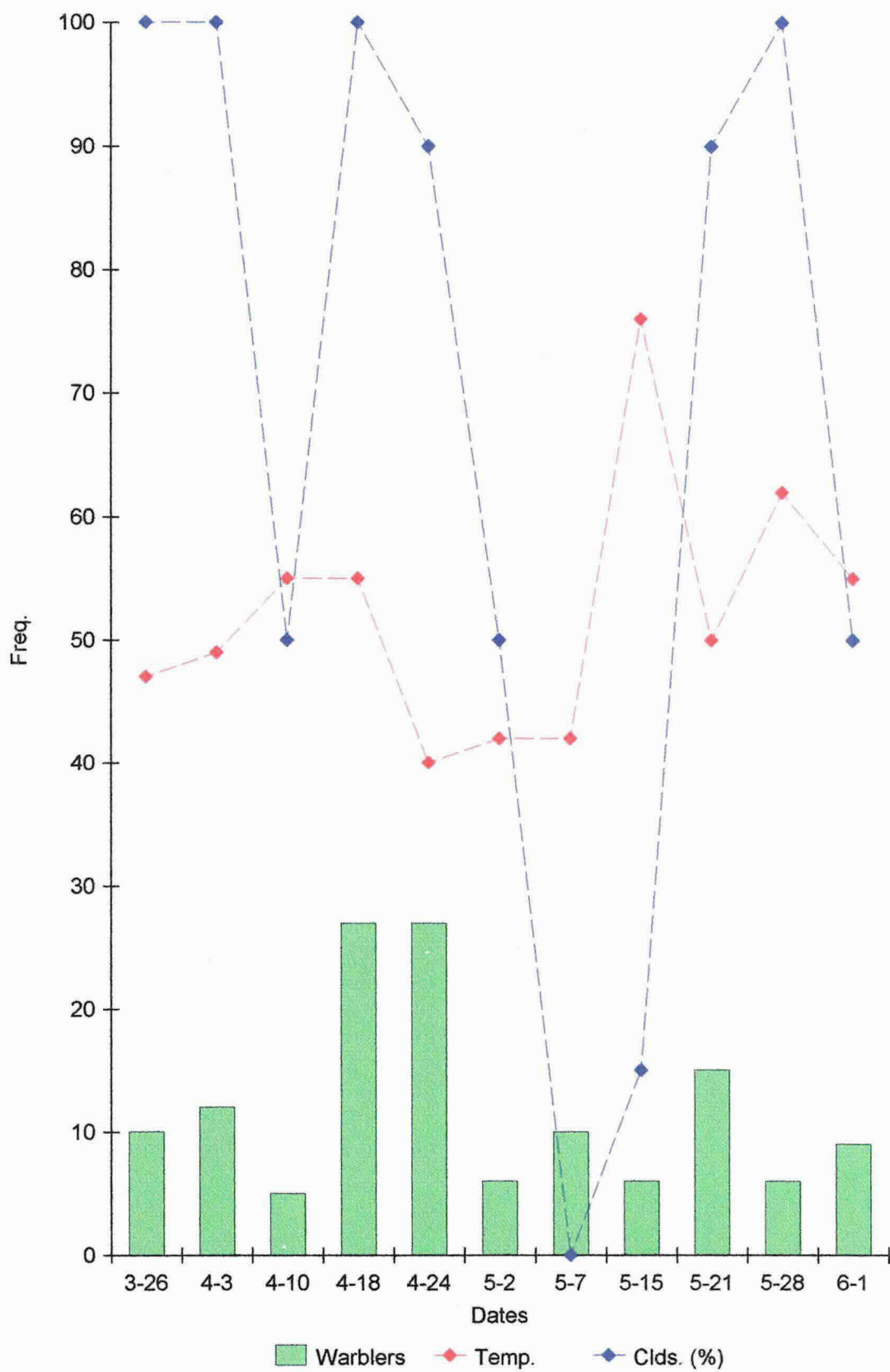
Sparrows In Spring (graph 2)



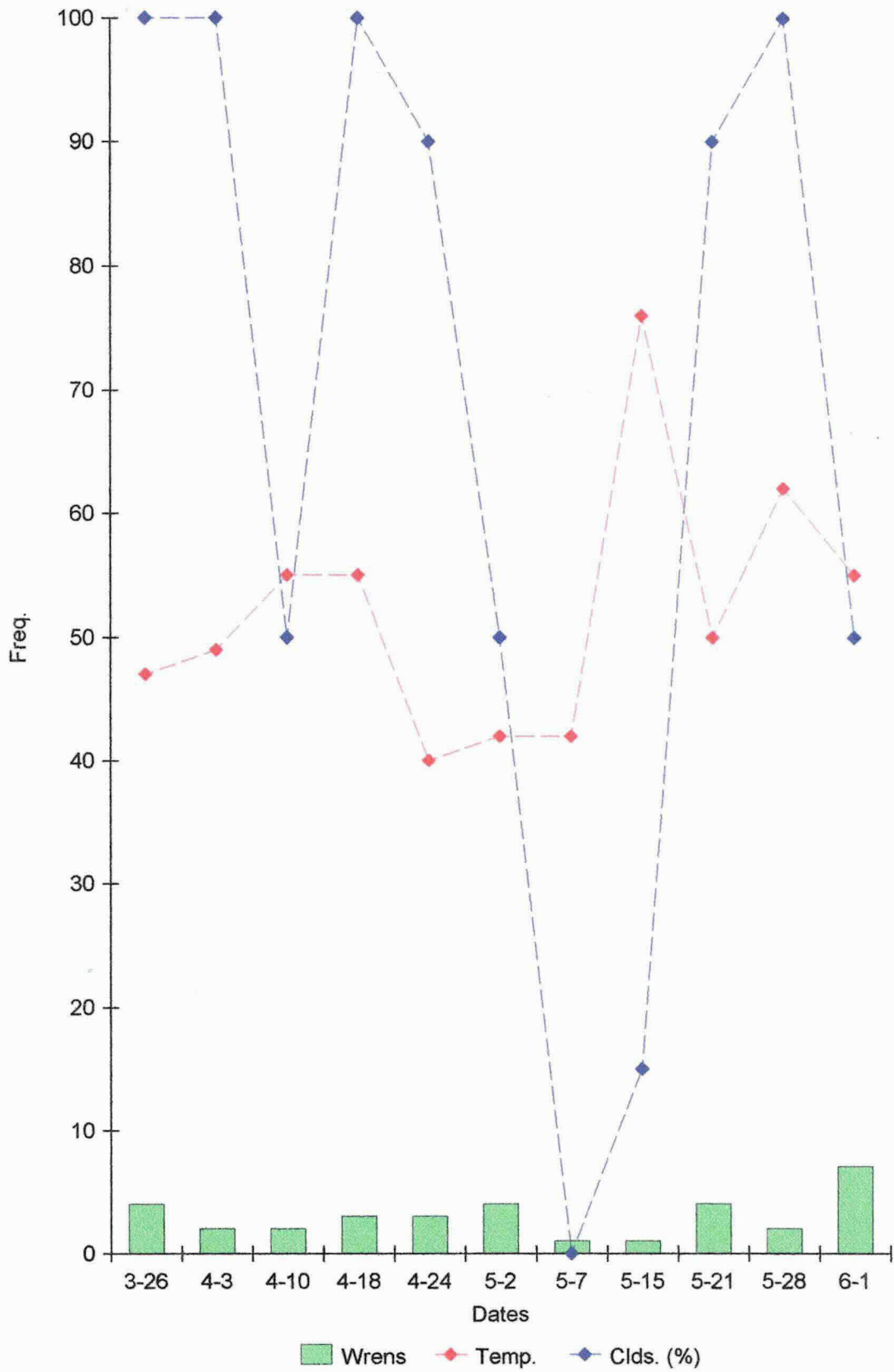
Swallows In Spring (graph 3)



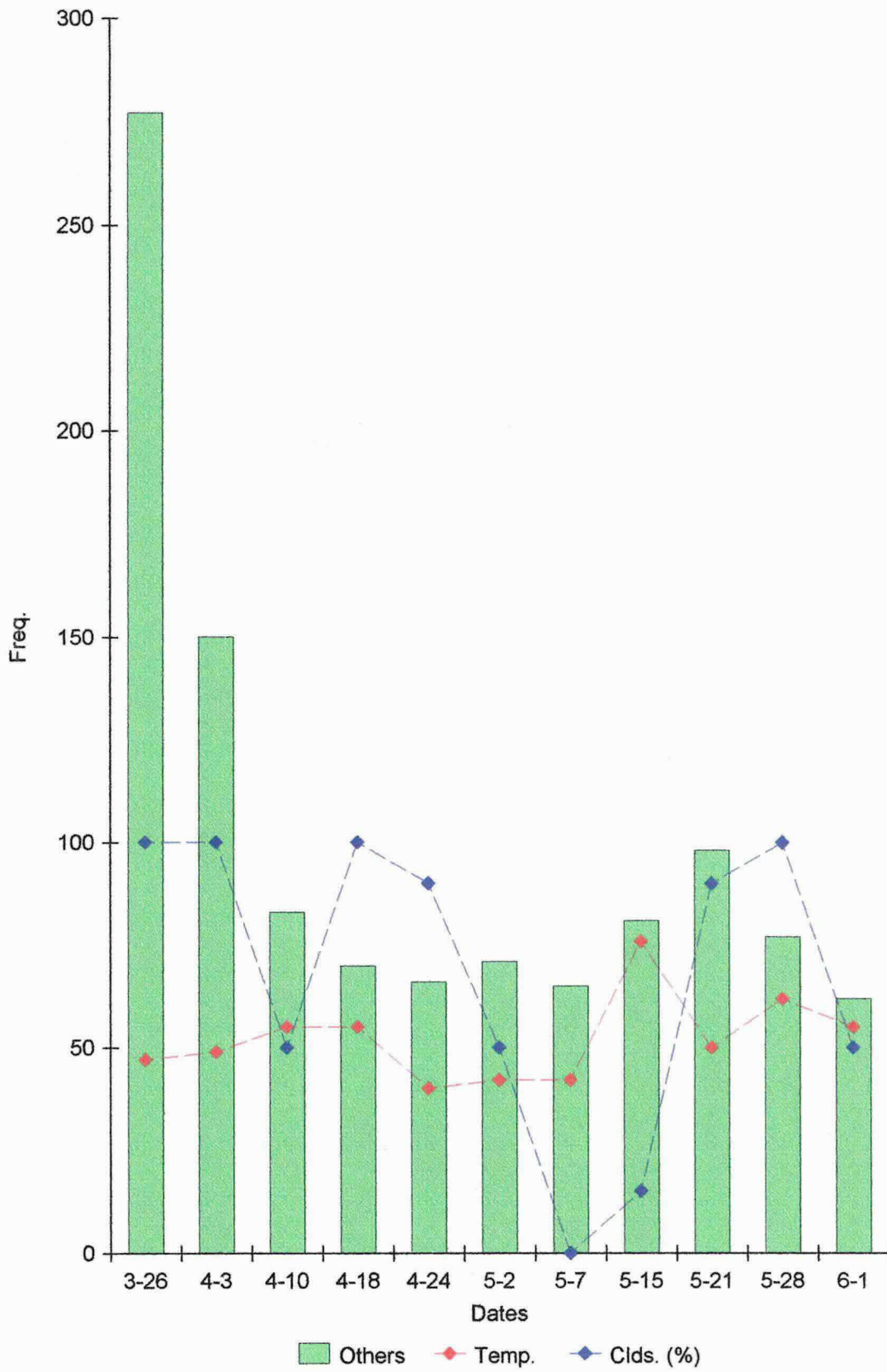
Warblers In Spring (graph 4)



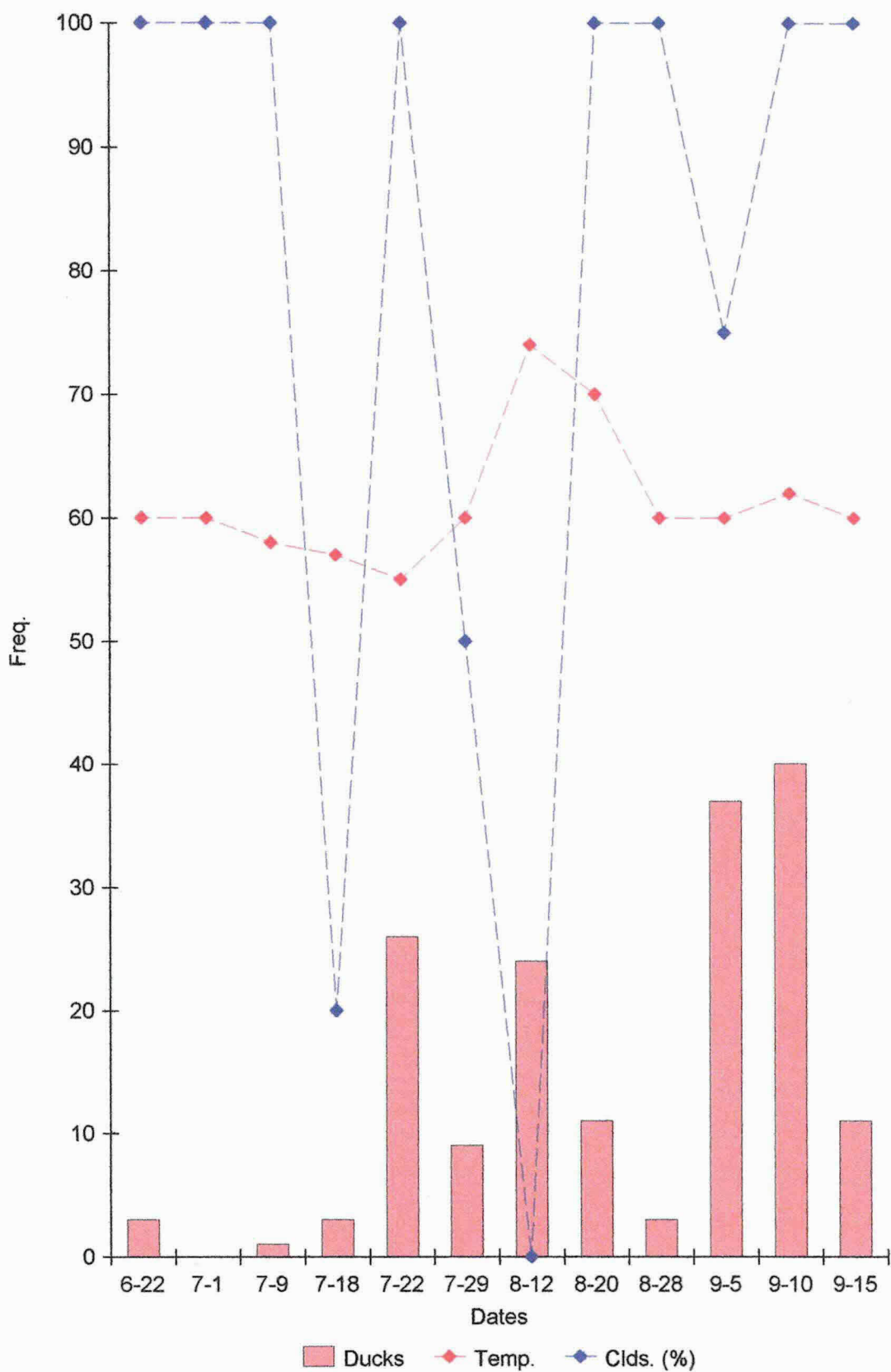
Wrens In Spring (graph 5)



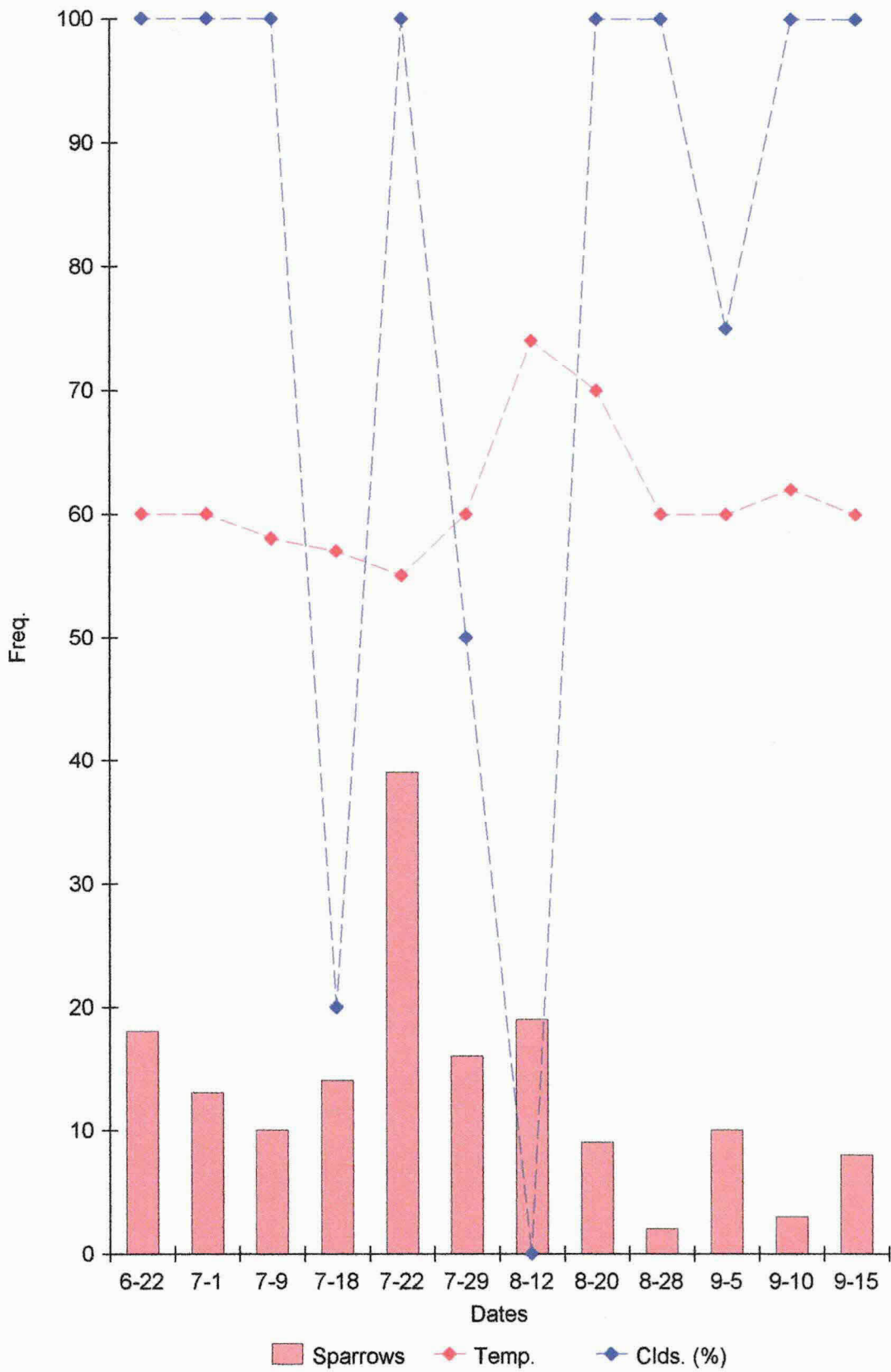
Others In Spring (graph 6)



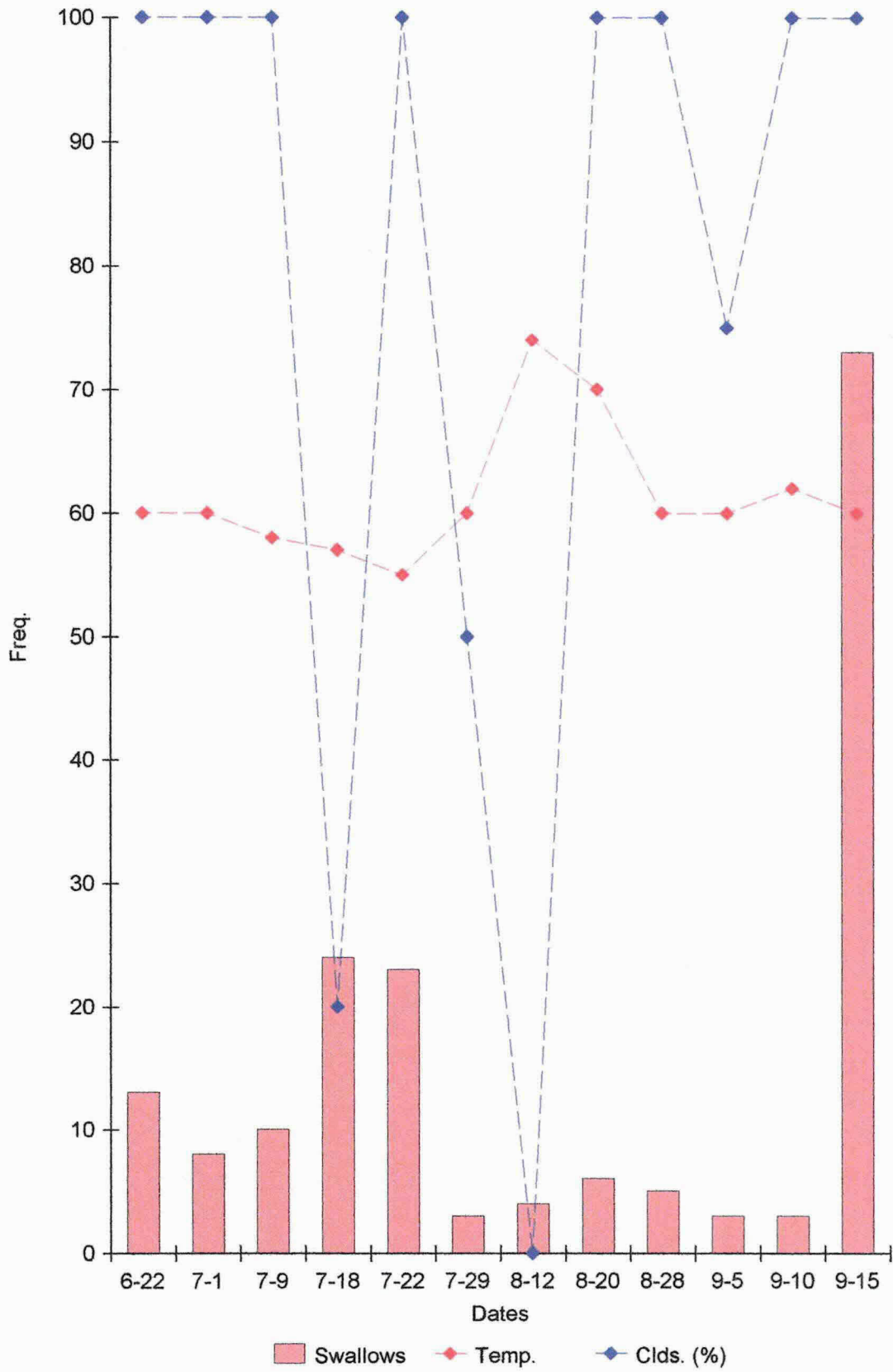
Ducks In Summer (graph 7)



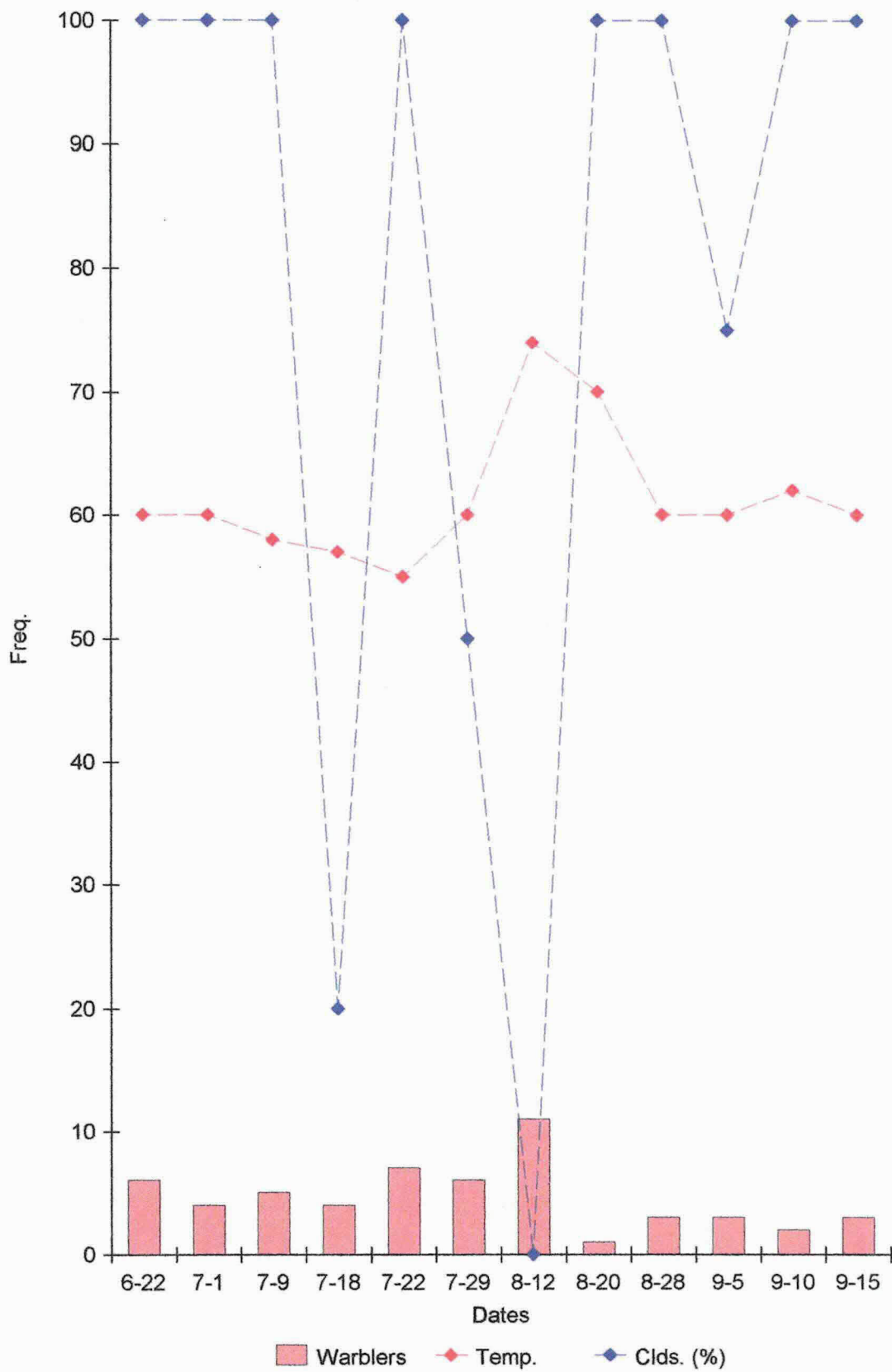
Sparrows In Summer (graph 8)



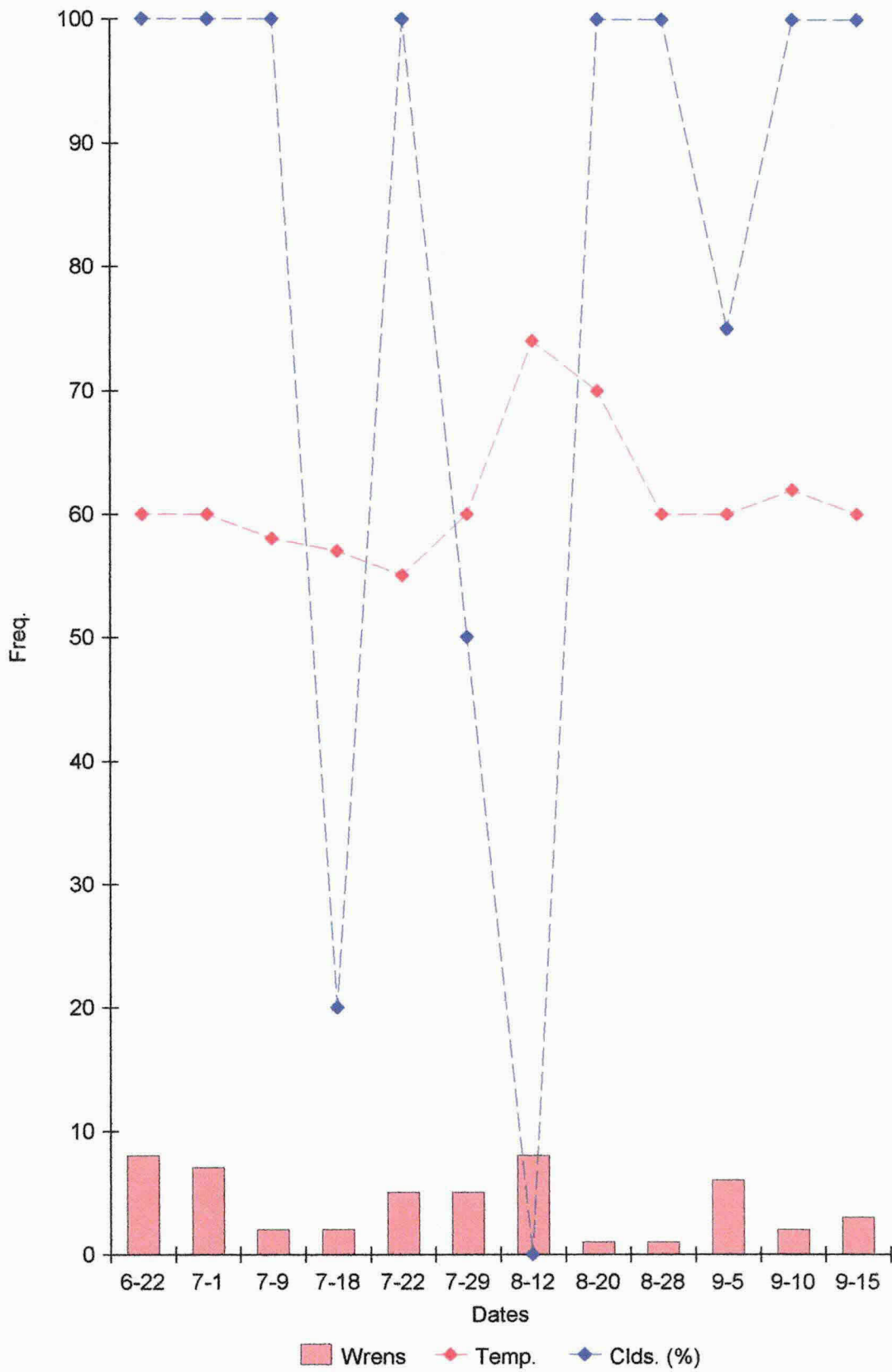
Swallows In Summer (graph 9)



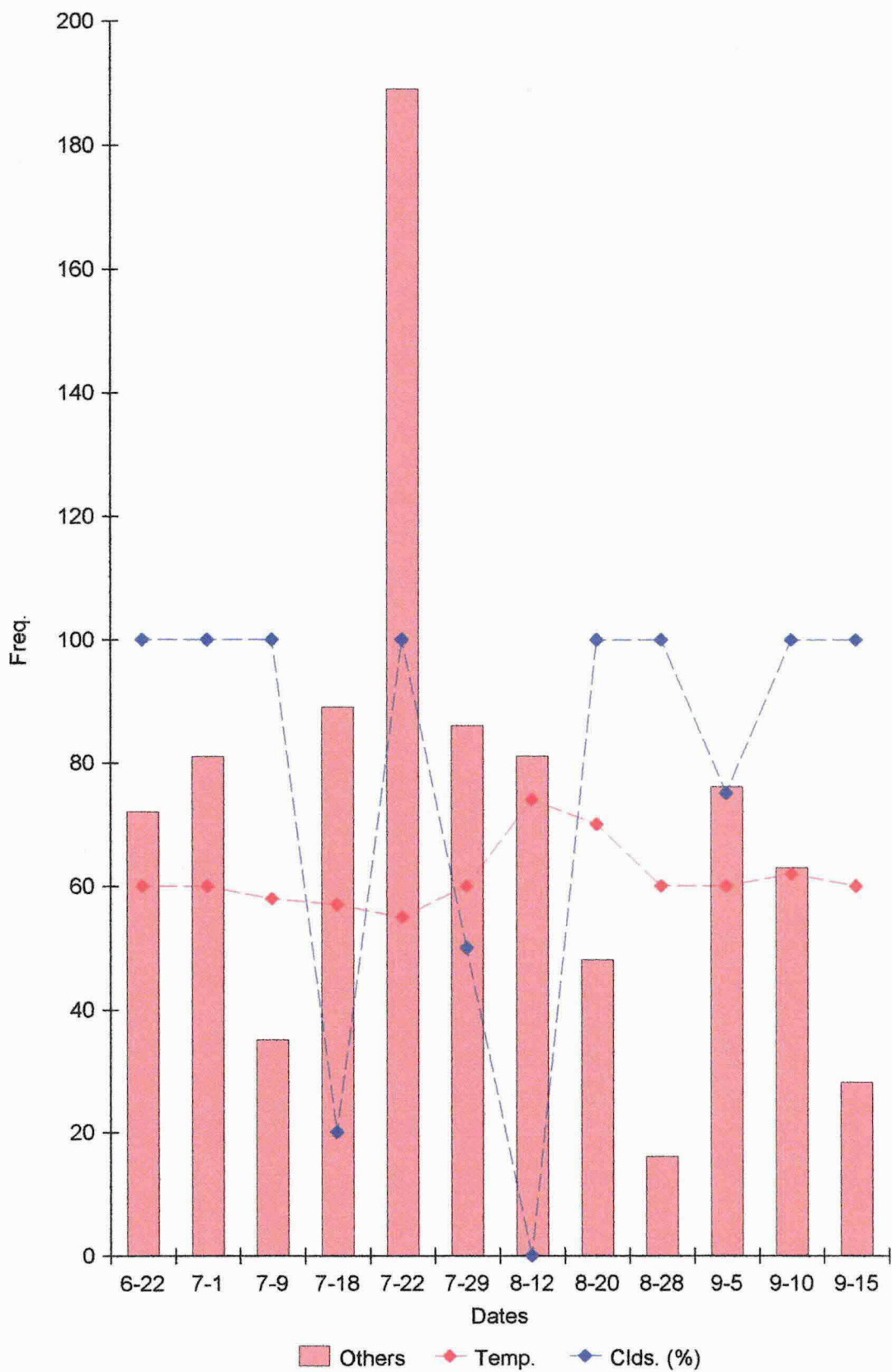
Warblers In Summer (graph 10)



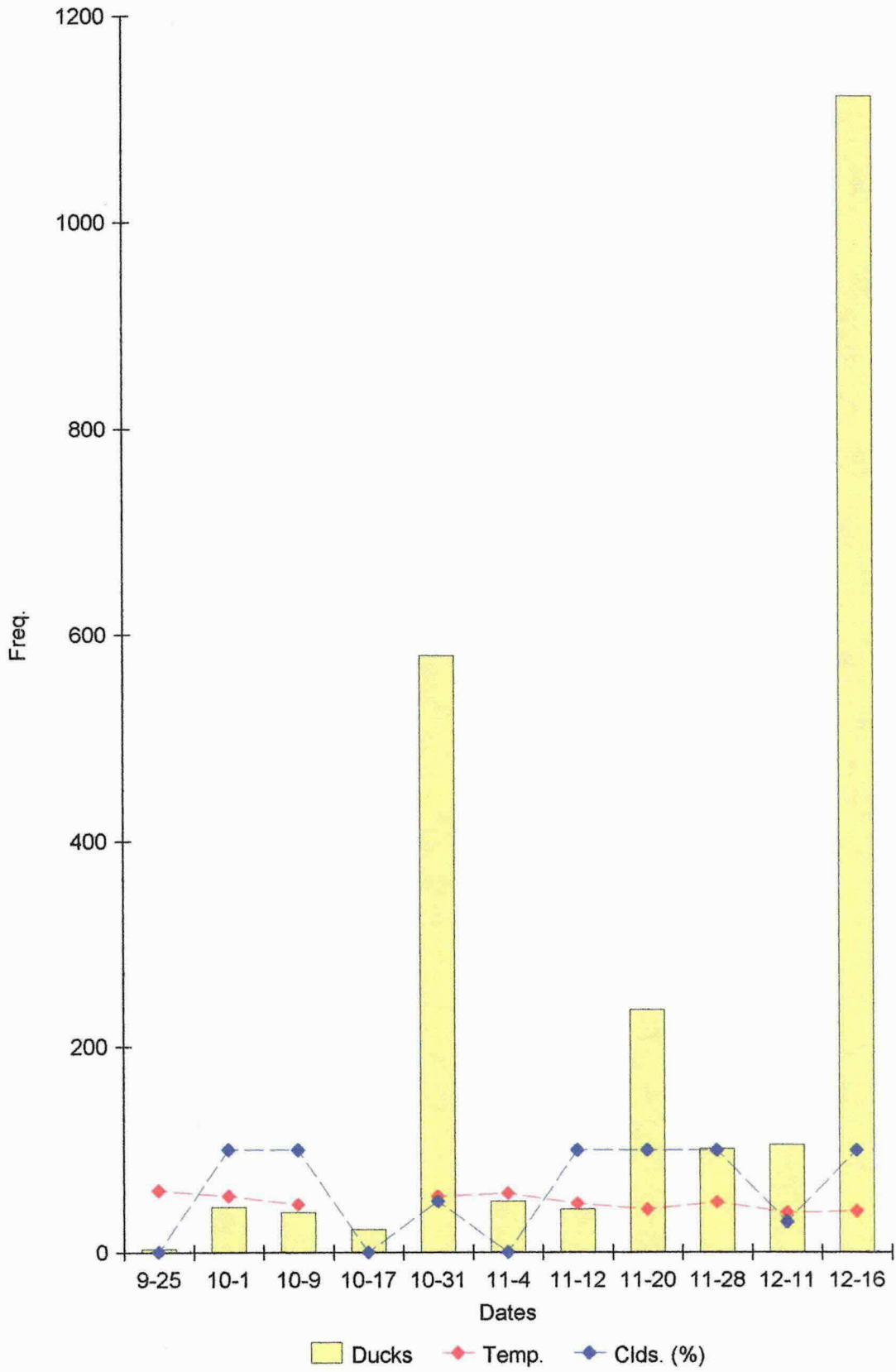
Wrens In Summer (graph 11)



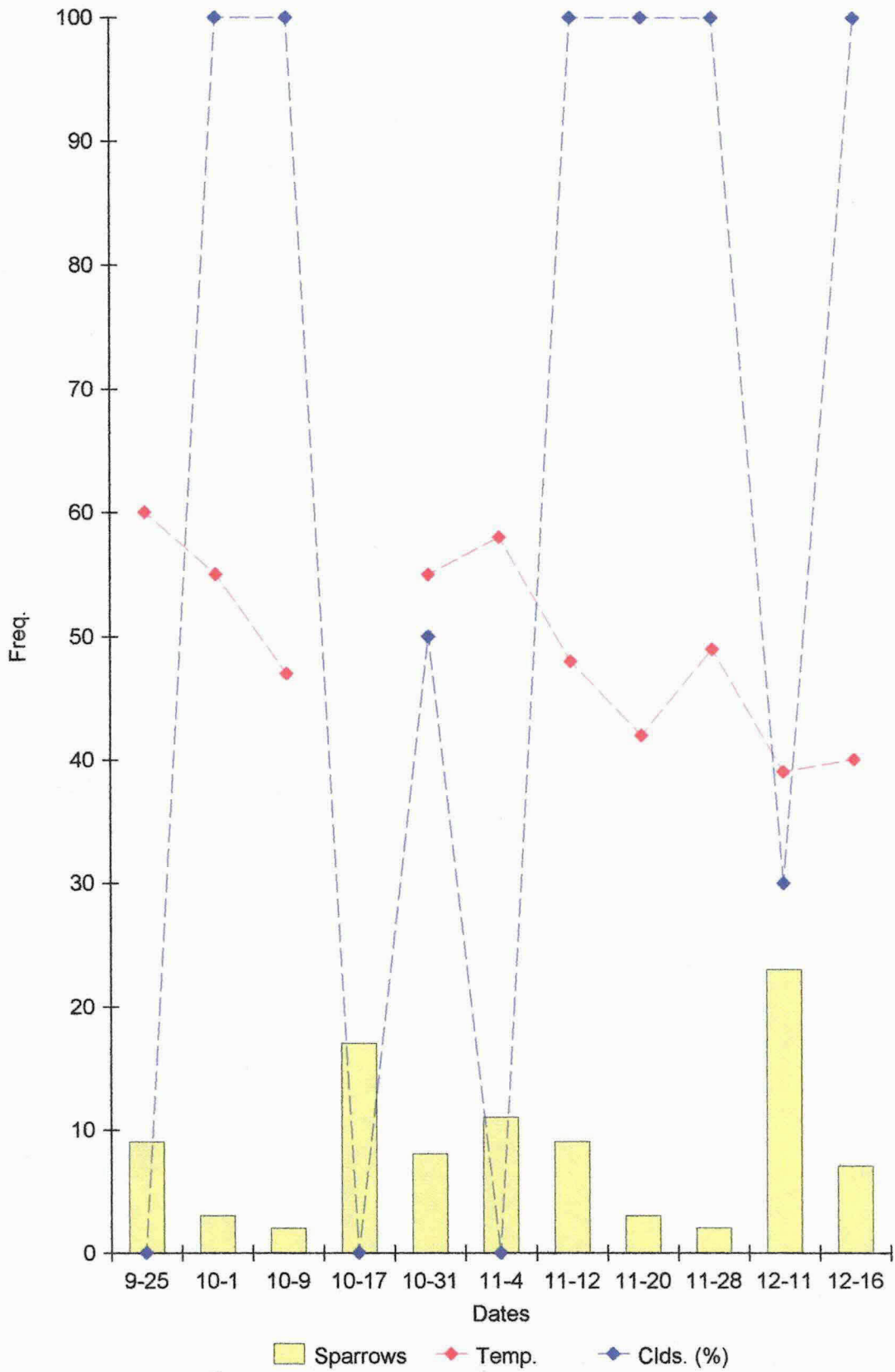
Others In Summer (graph 12)



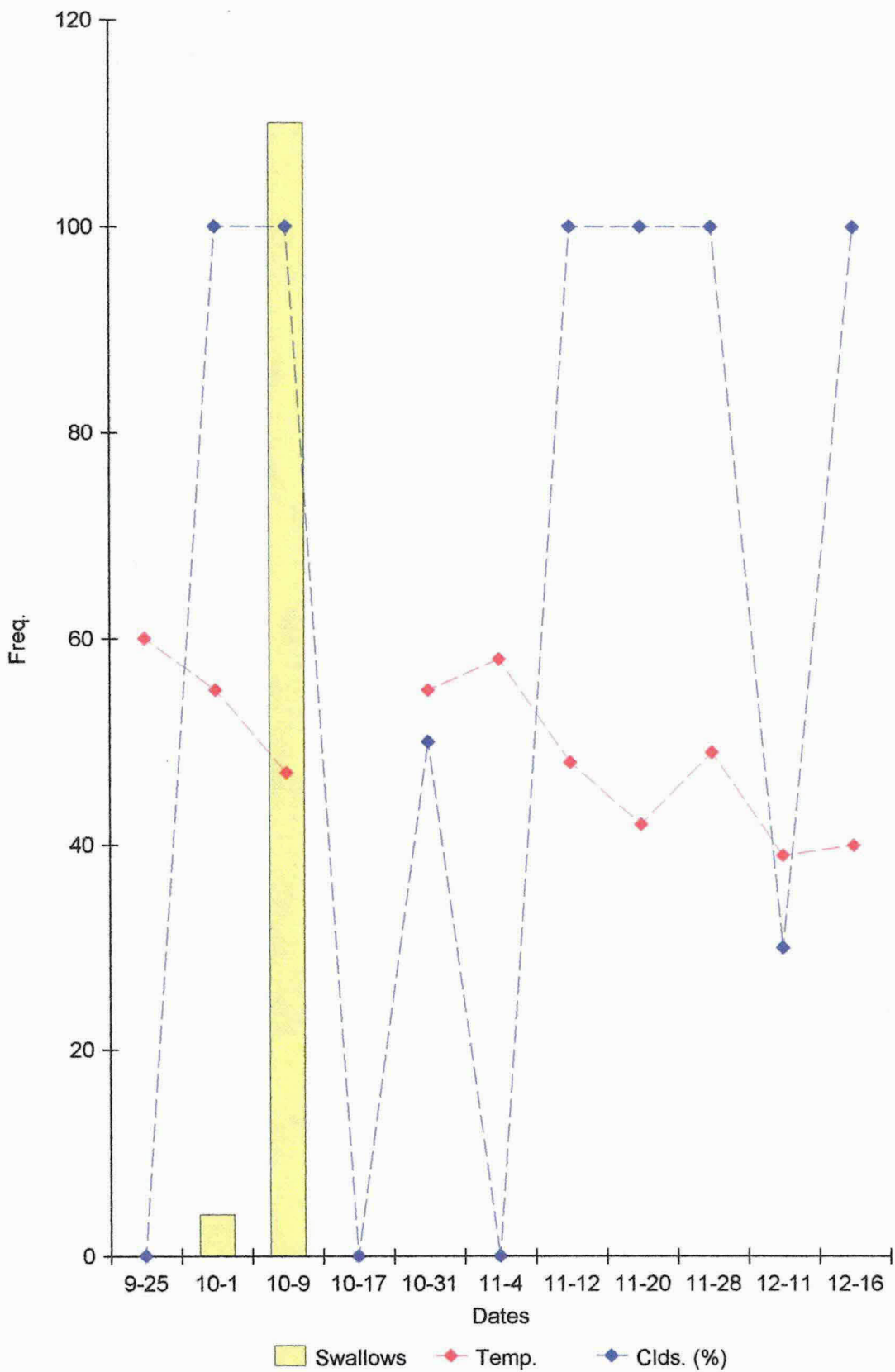
Ducks In Fall (graph 13)



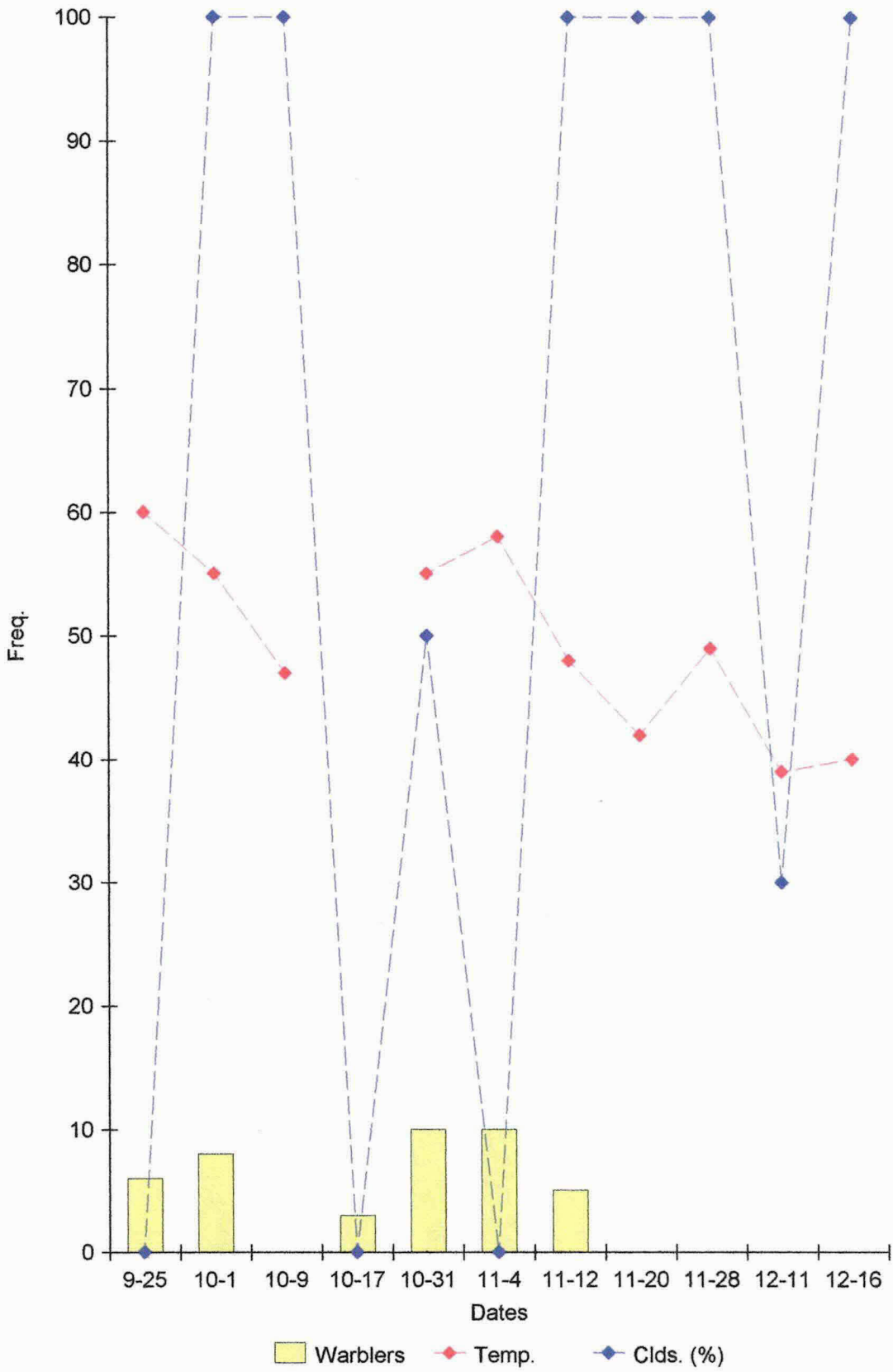
Sparrows In Fall (graph 14)



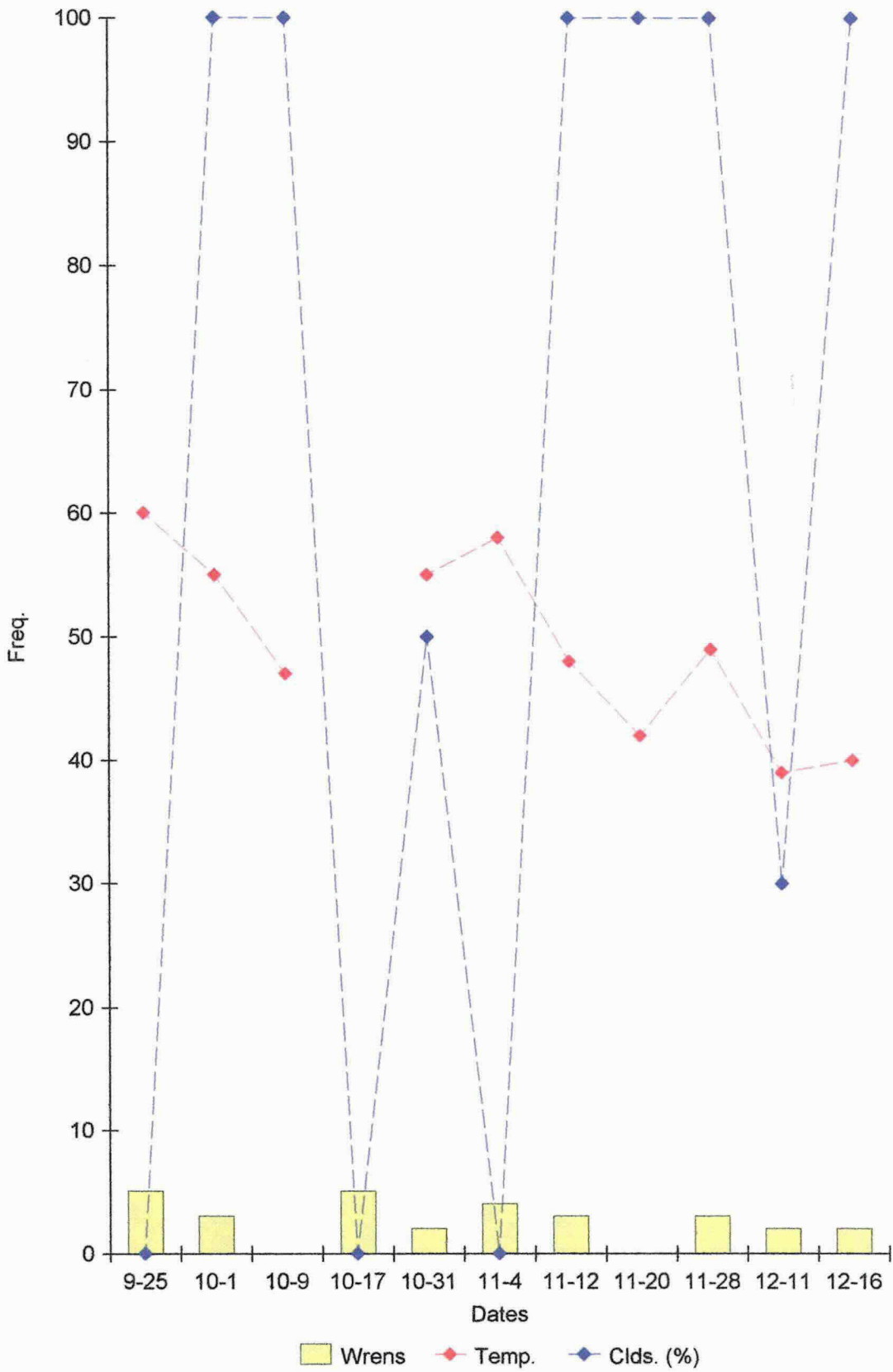
Swallows In Fall (graph 15)



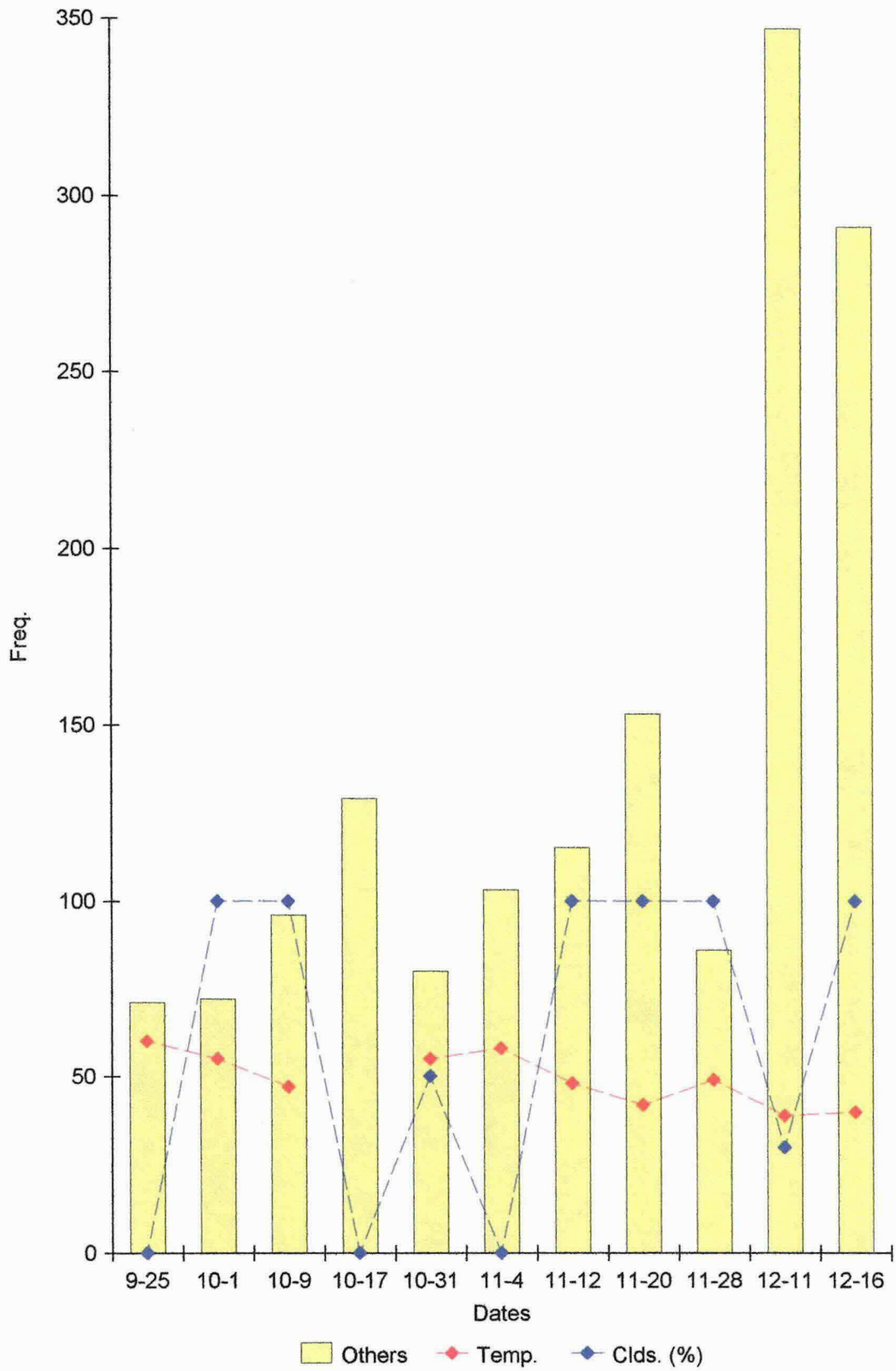
Warblers In Fall (graph 16)



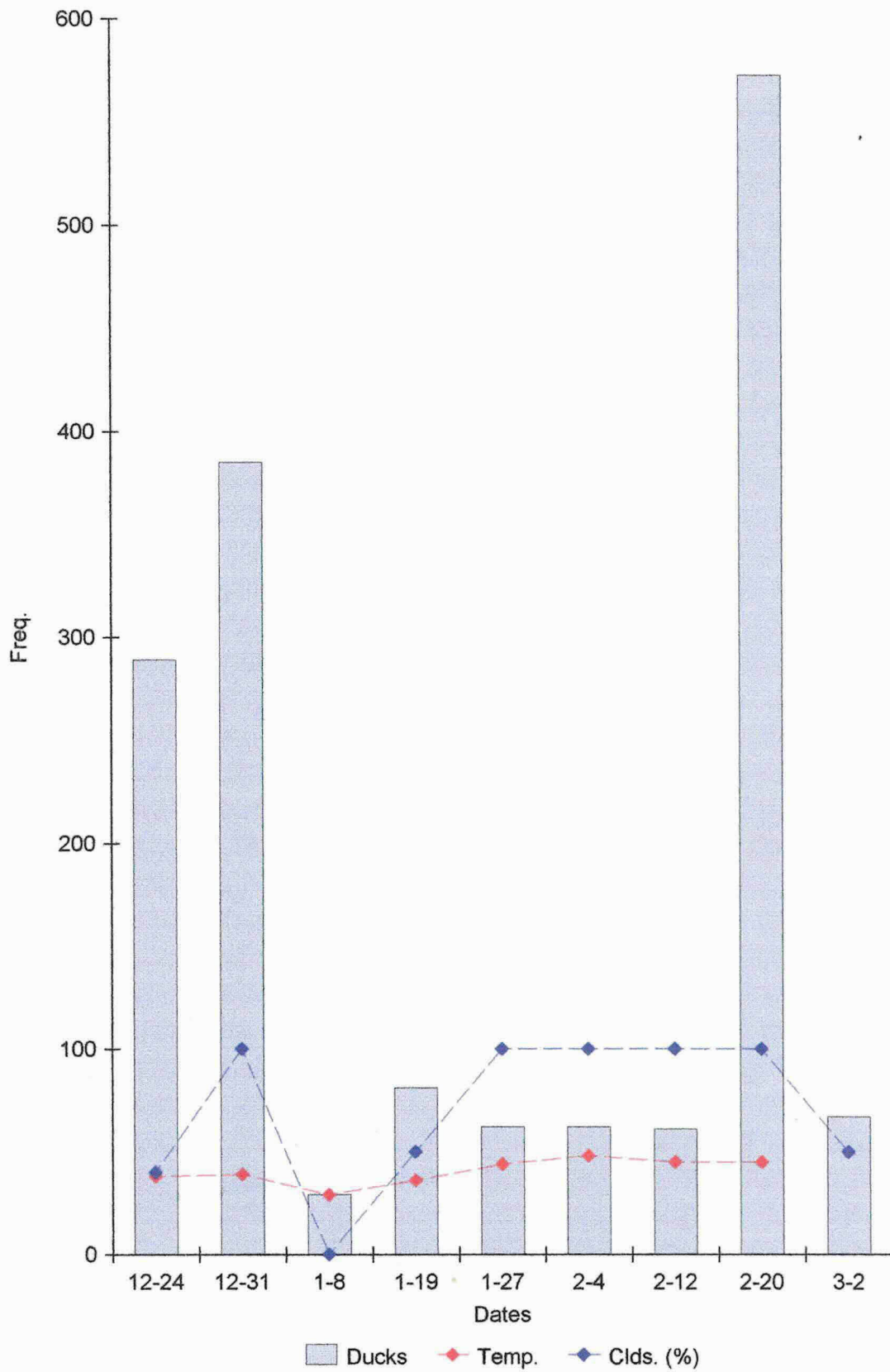
Wrens In Fall (graph 17)



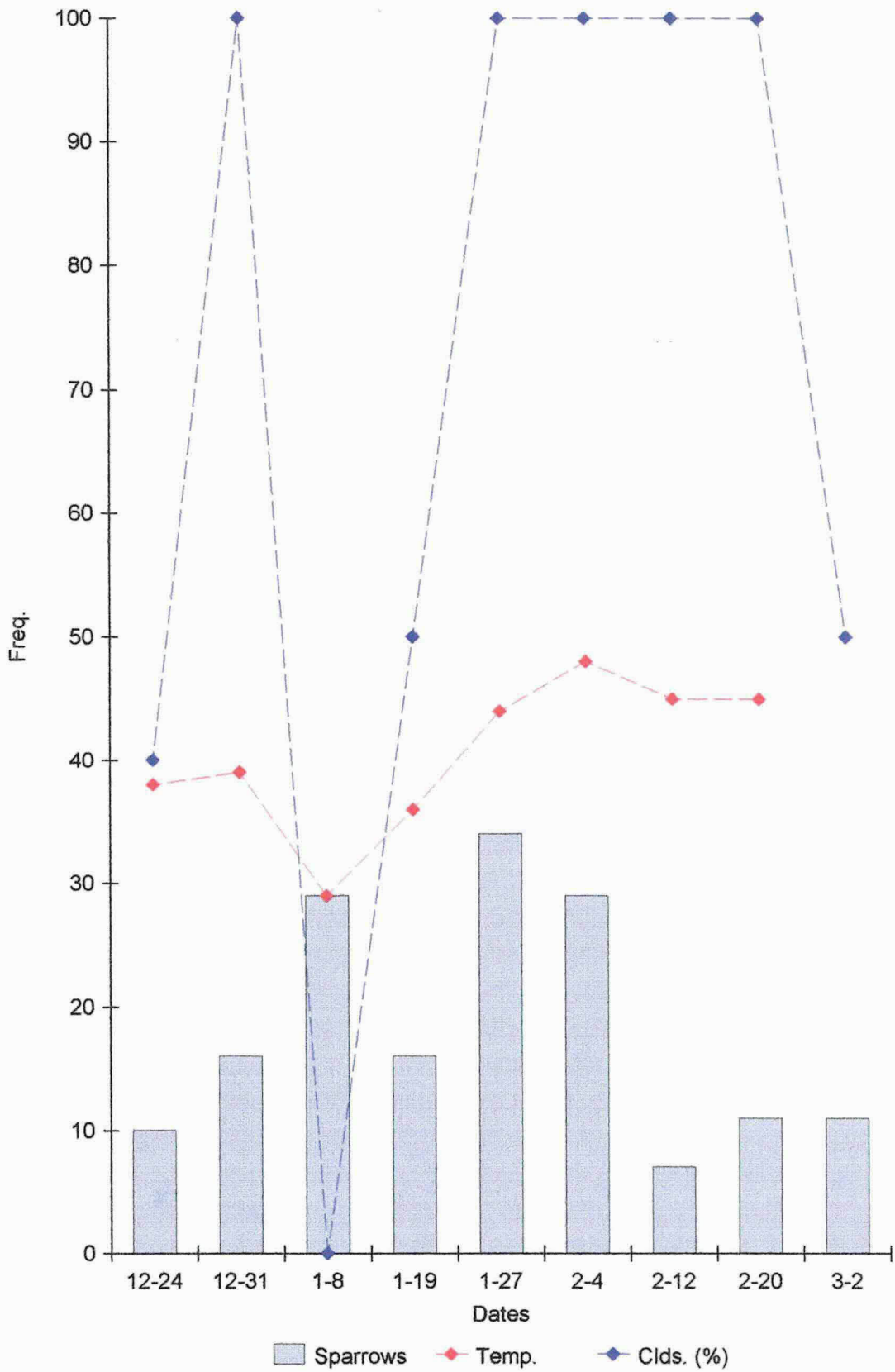
Others In Fall (graph 18)



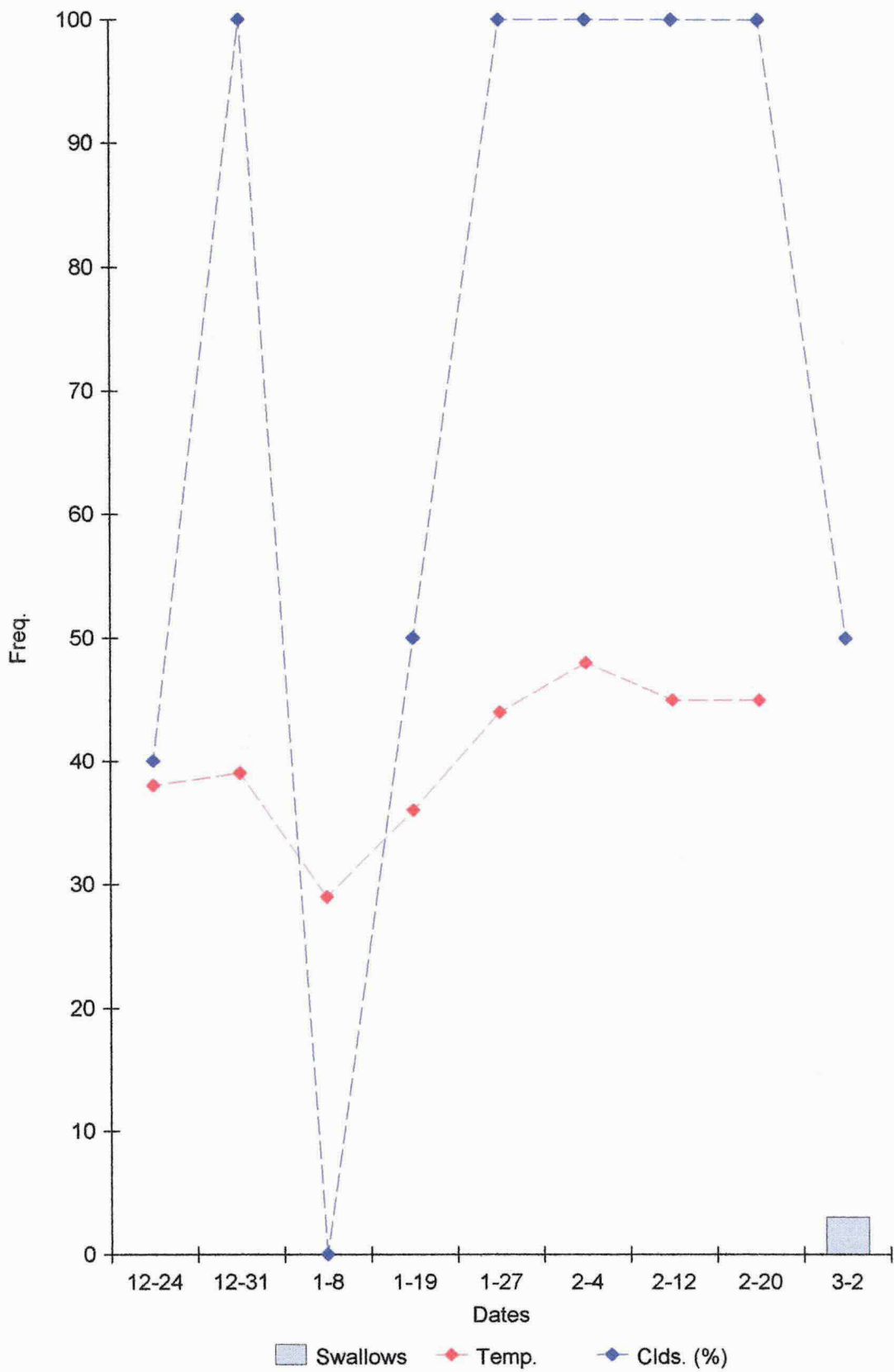
Ducks In Winter (graph 19)



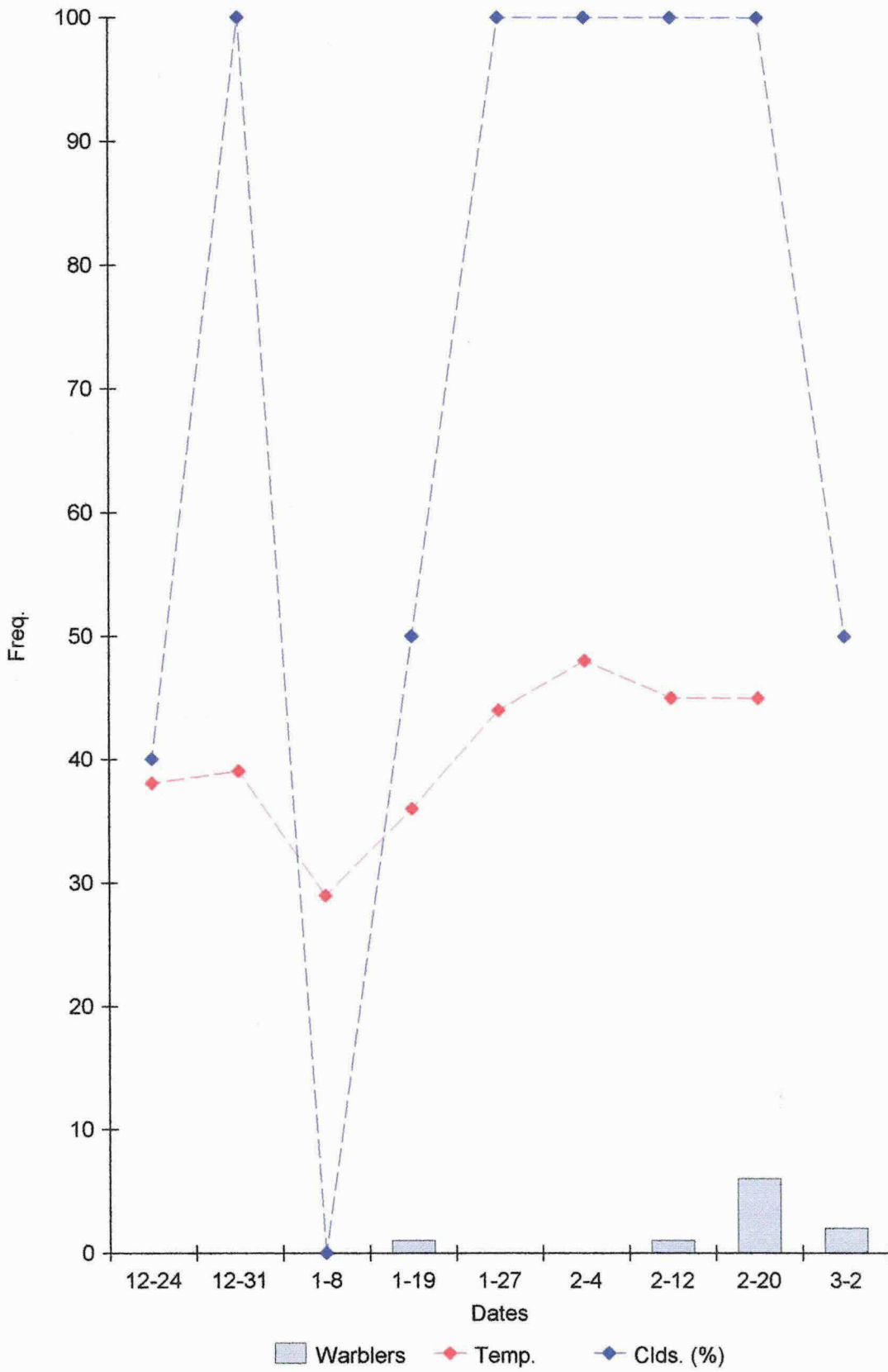
Sparrows In Winter (graph 20)



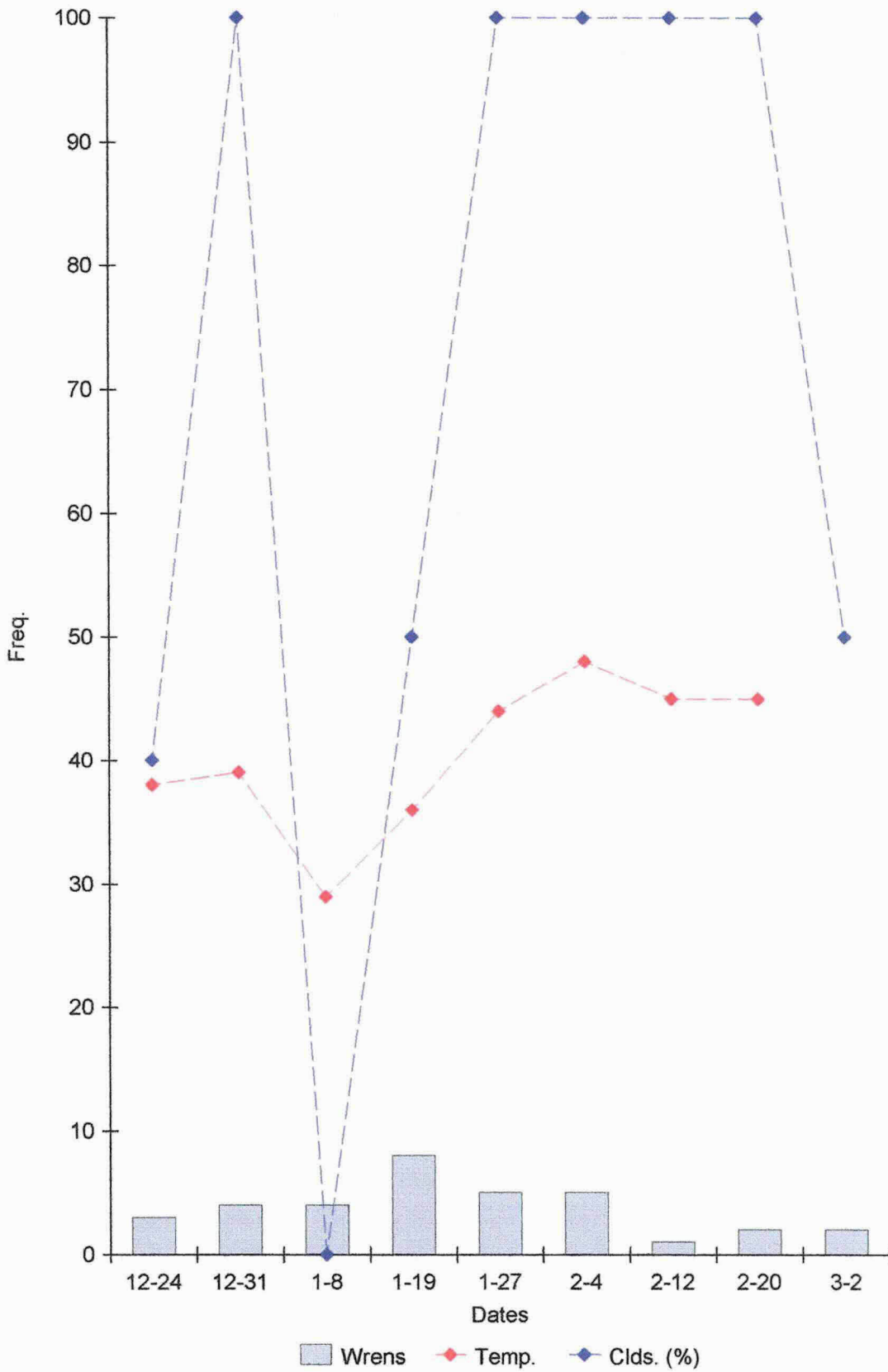
Swallows In Winter (graph 21)



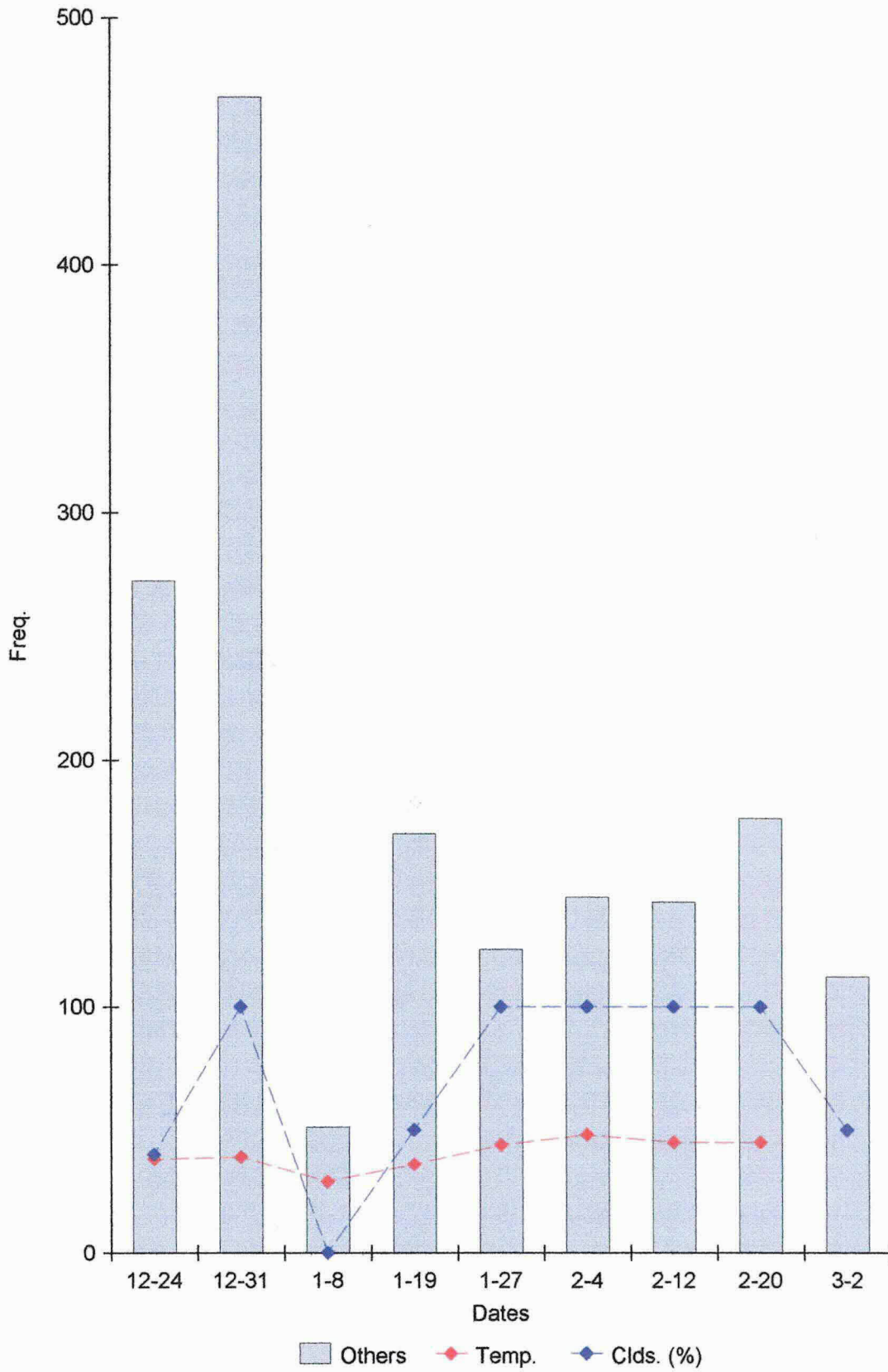
Warblers In Winter (graph 22)



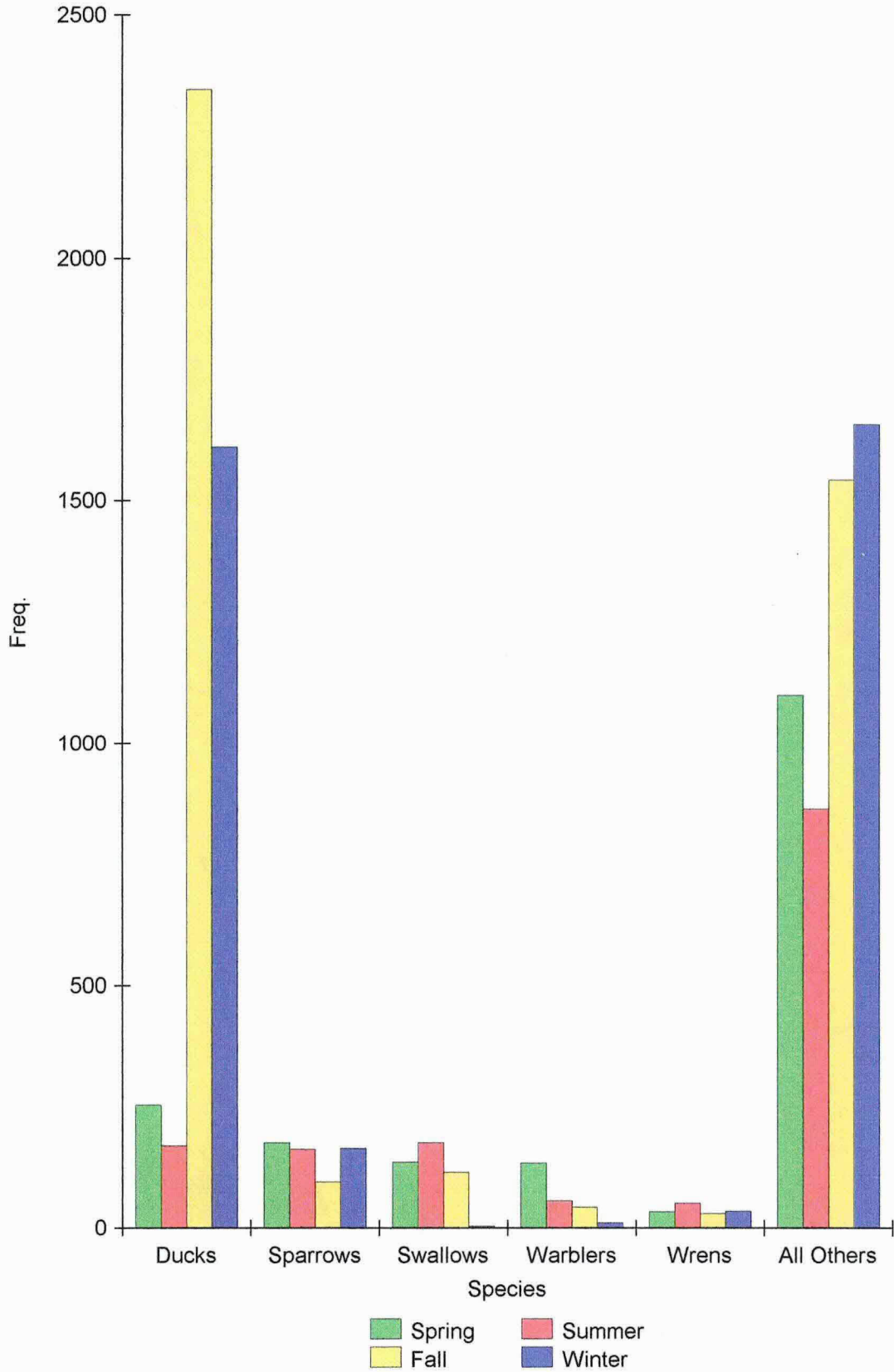
Wrens In Winter (graph 23)



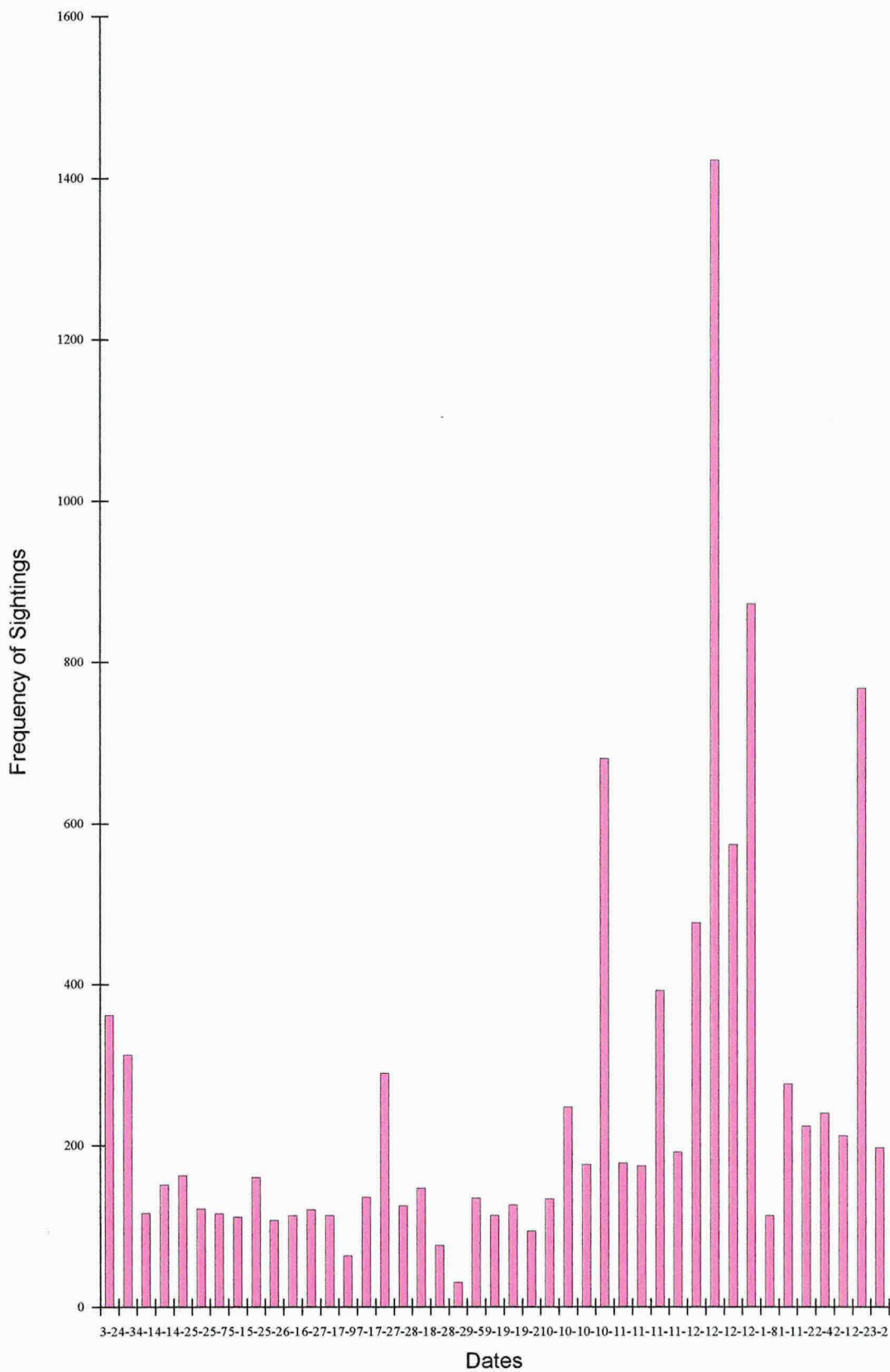
Others In Winter (graph 24)



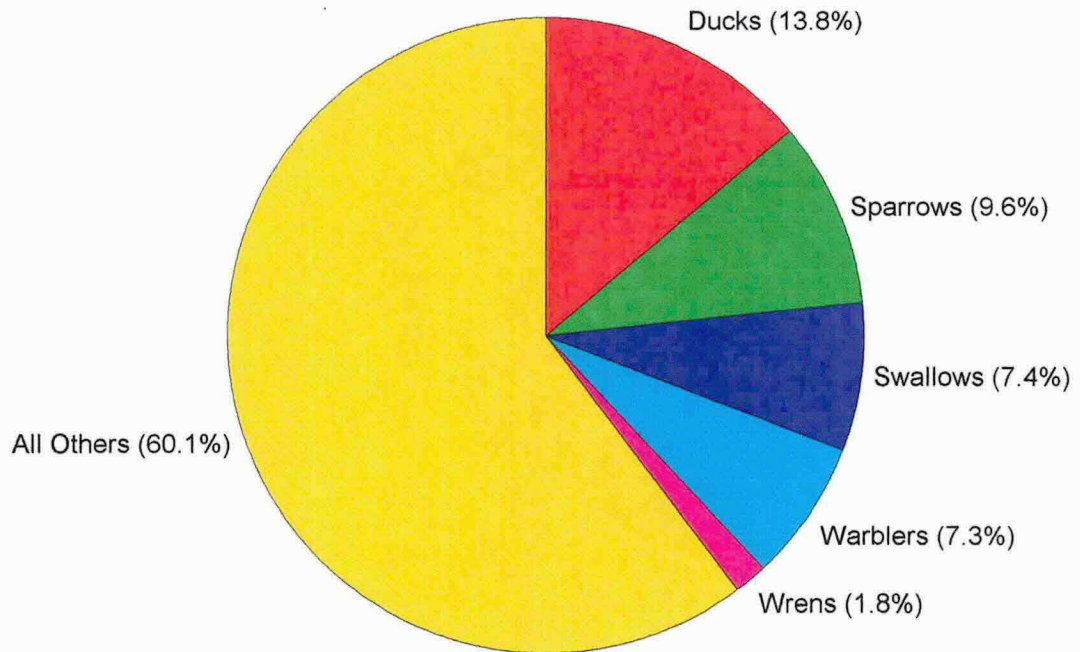
Year Totals (graph 25)



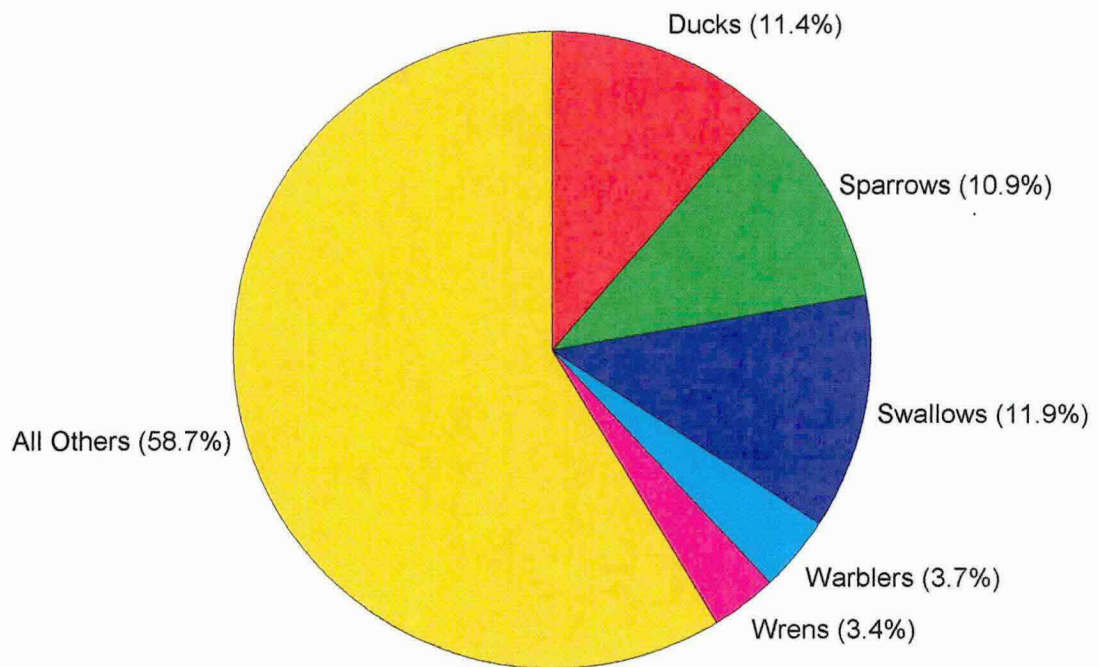
TOTAL for '97- '98 (graph 26)



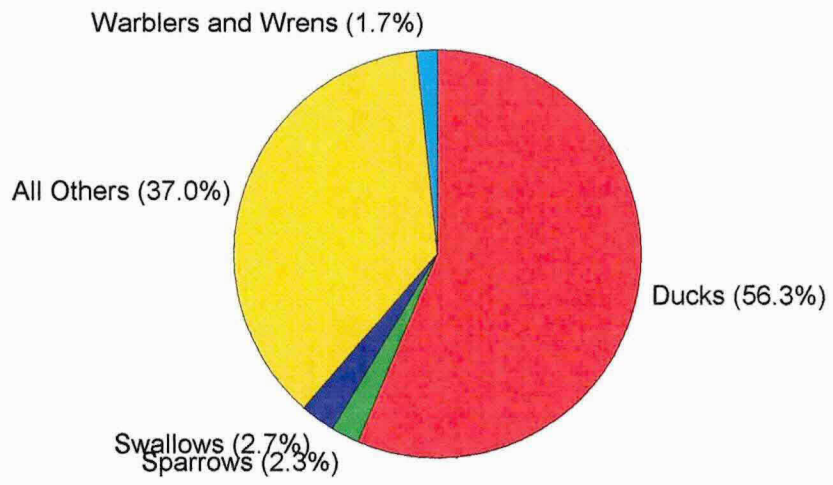
Spring (graph 27)



Summer (graph 28)



Fall (graph 29)



Winter (graph 30)

