

# Wild ecology in domesticated Canterbury

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*Habitat use & phenology of birds, butterflies, & mammals  
in urban & rural Christchurch*

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Presented to the New Zealand Ecological Society annual conference in Dunedin on 23 November 2010.



*"the crushingly boring Canterbury Plains"* Shayne Carter

Shayne Carter, ([Straitjacket Fits](#)/[Dimmer](#))

Living in Christchurch and working in Lincoln is like being stuck in the transit lounge at the air port. It's not quite New Zealand but there are amazing things not far away. Still, there's interesting wild ecology to be understood.



Standard species, standard routes

17 km ride Hoon Hay-Lincoln via Ladbrooks, most work days since March 2003

19 km run route through suburban Christchurch, half run each week since July 2008

All pre-human forest birds, all butterflies, all road-kill, all birds bigger than starlings.

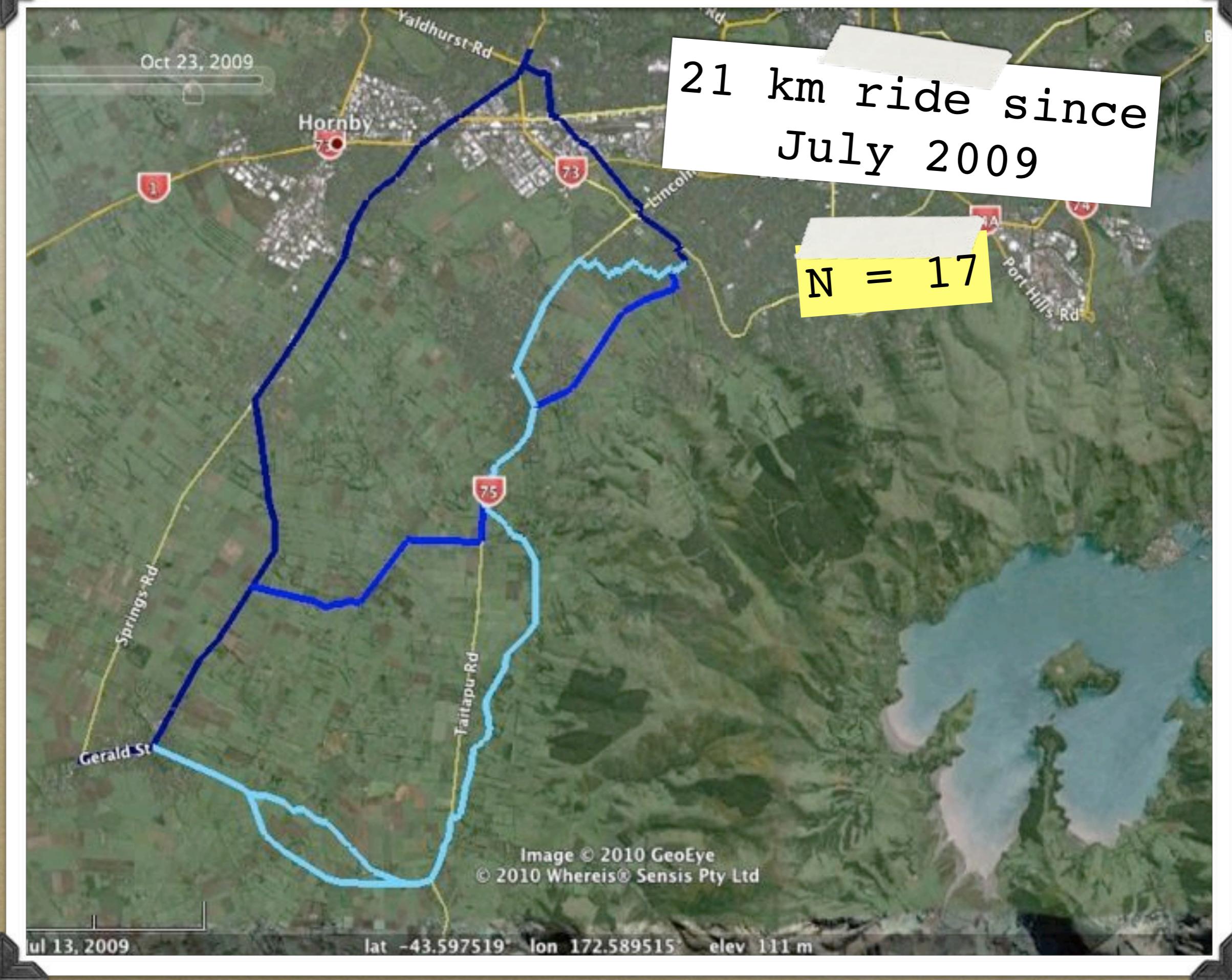


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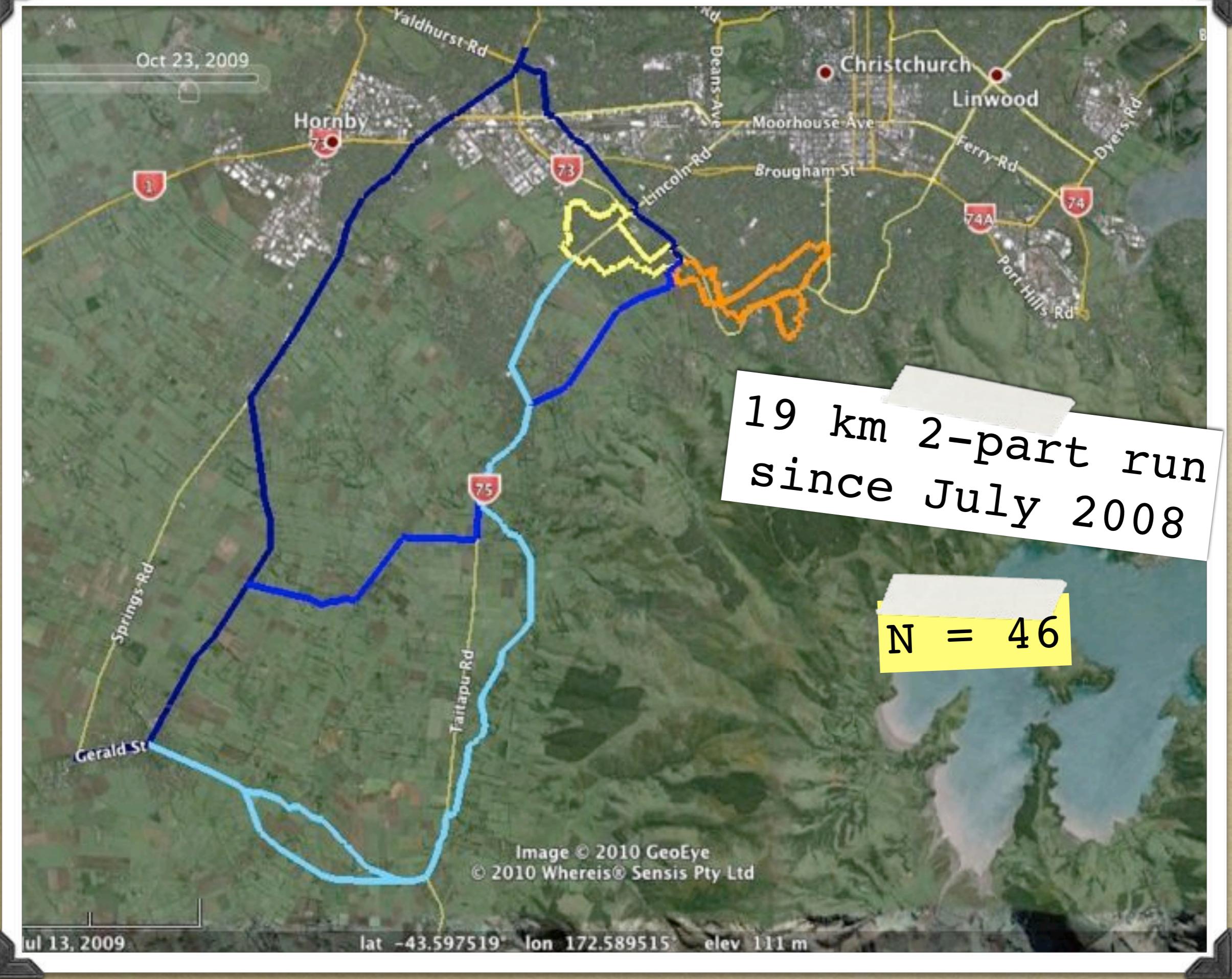


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all pre-human  
forest birds

all wild birds  
bigger than  
starlings

all wild mammals

all car-kills

all butterflies

Specie	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	850	851	852	853	854	855	856	857



\*Individually geotagged since November 2008



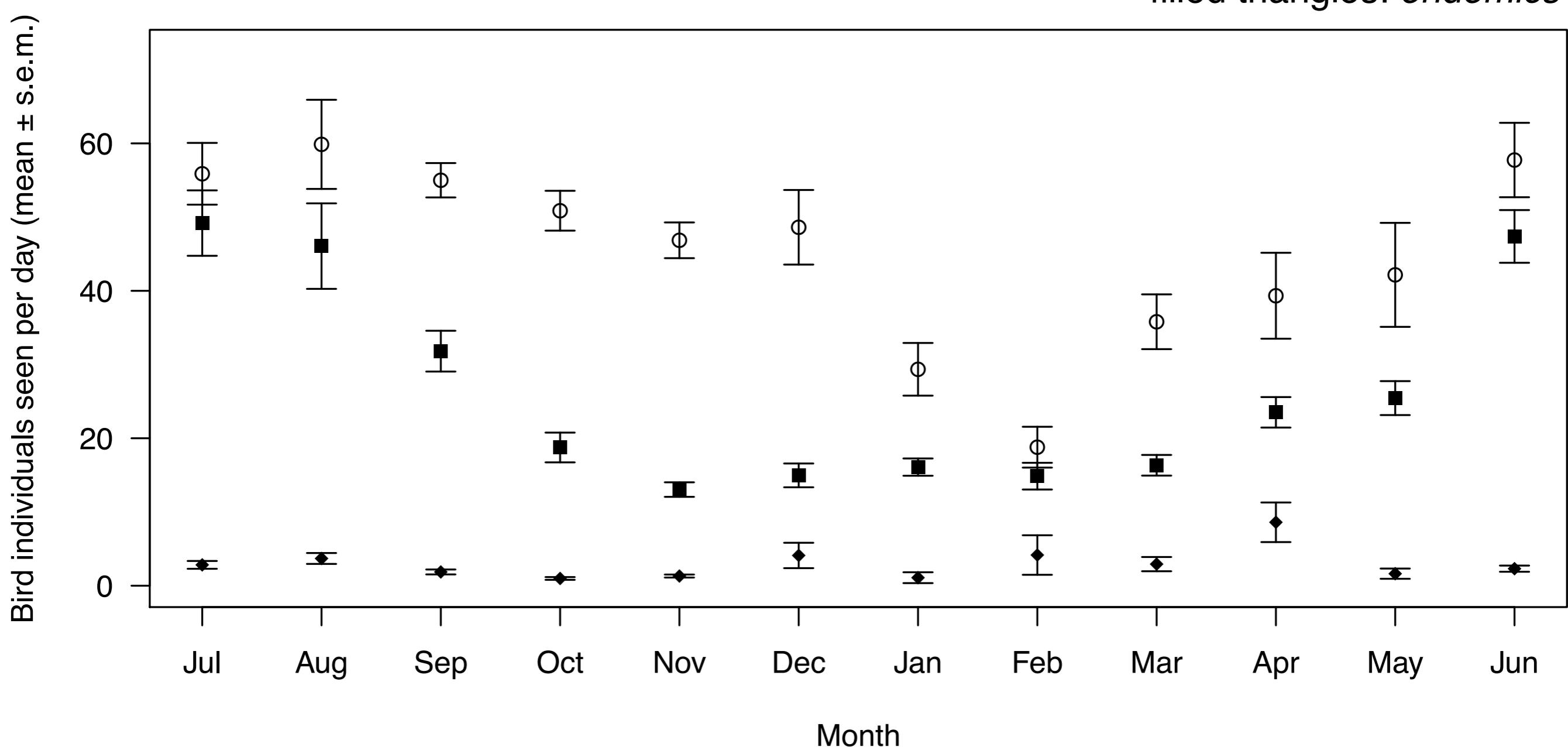
## Live birds

This is a photo of a white-faced heron and a spur-winged plover (rear) feeding in the spray zone of an effluent irrigator on a dairy farm. Wetland birds like irrigated dairy fields.

Which season is best for birds on  
the Plains?

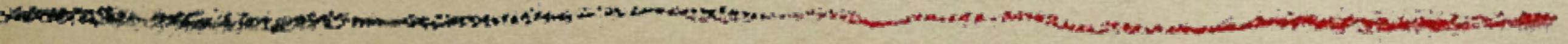


open circles: *naturalised*  
filled squares: non-endemic *natives*  
filled triangles: *endemics*

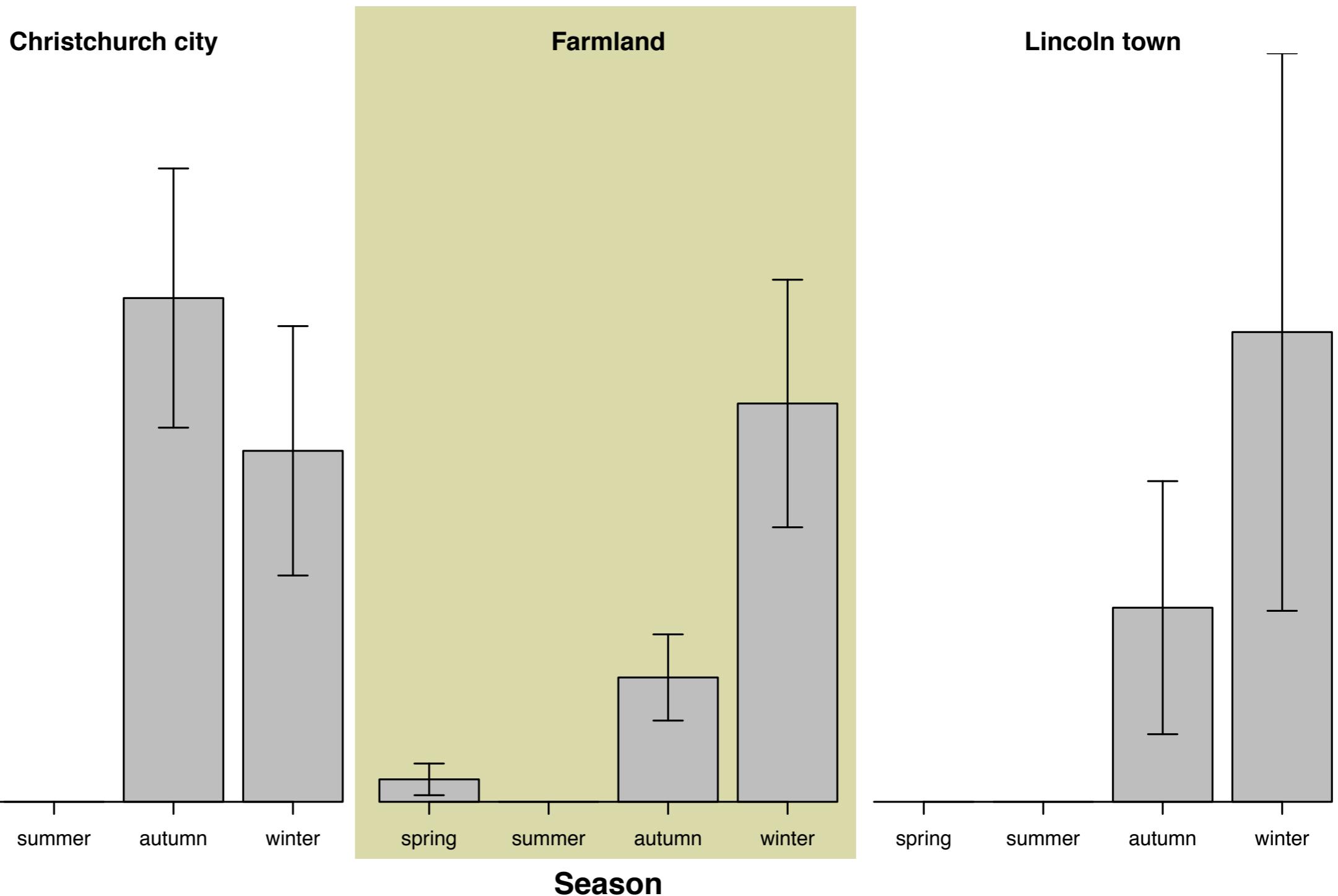


Native birds, especially, peak in winter months when the plains is wet. These include many wetland birds. When the plains dries out in the summer, most birds leave.

What's better for native birds: city  
or farmland?



# *Bellbirds*

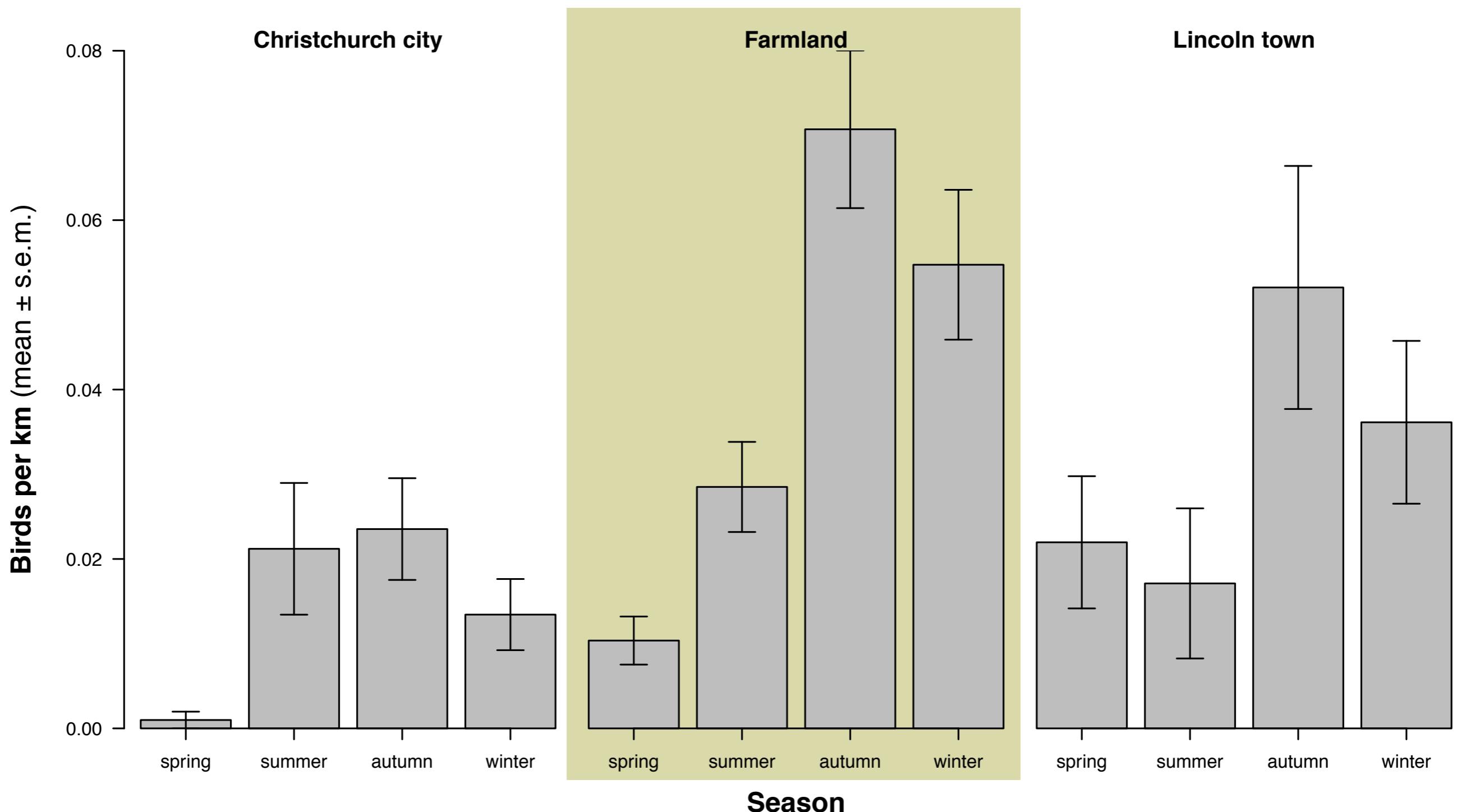


Bellbirds show up where the eucalypt trees are when they flower.

155 bellbird observations on bike route

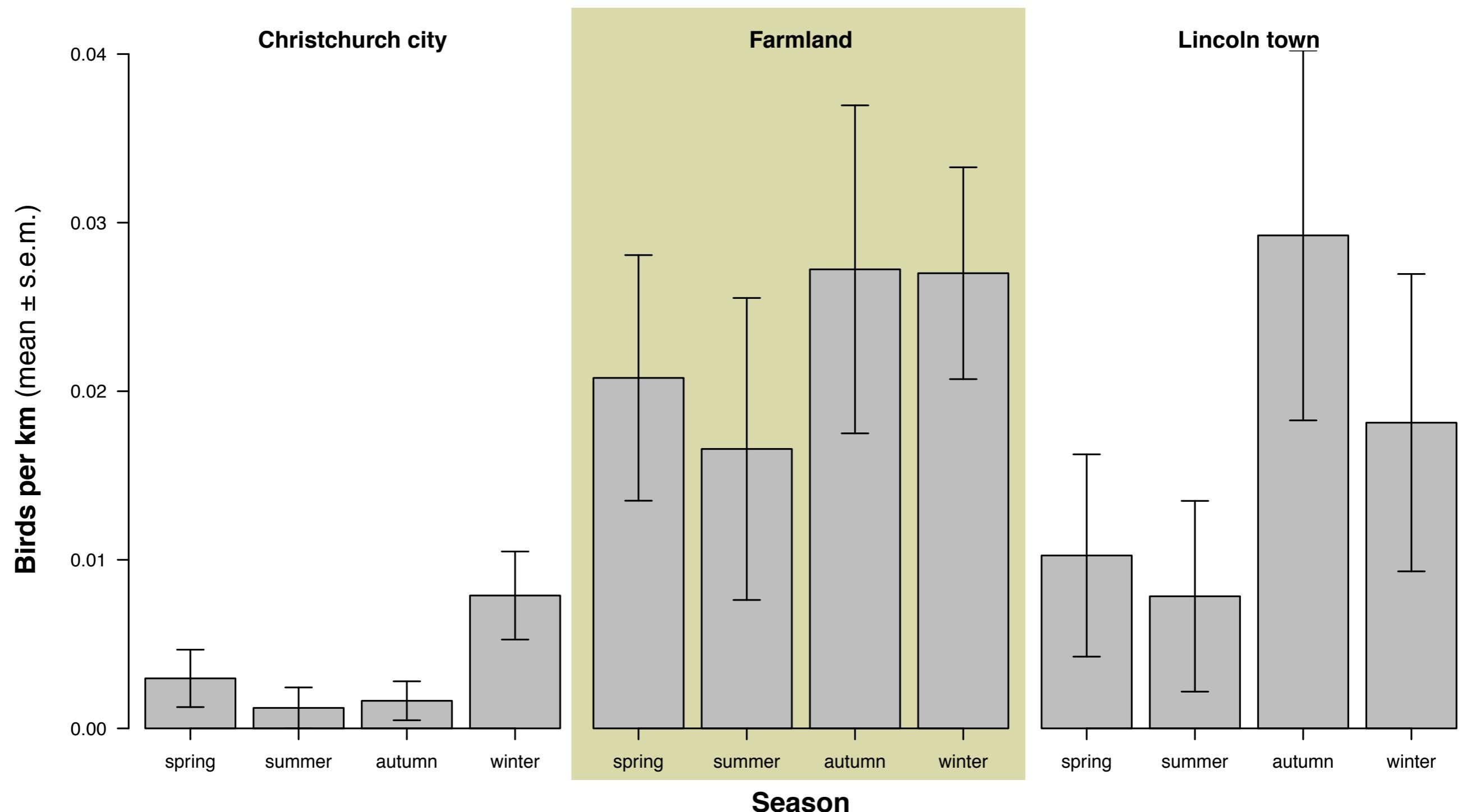
92 (60%) include “euc” in comments.

# *Fantails*

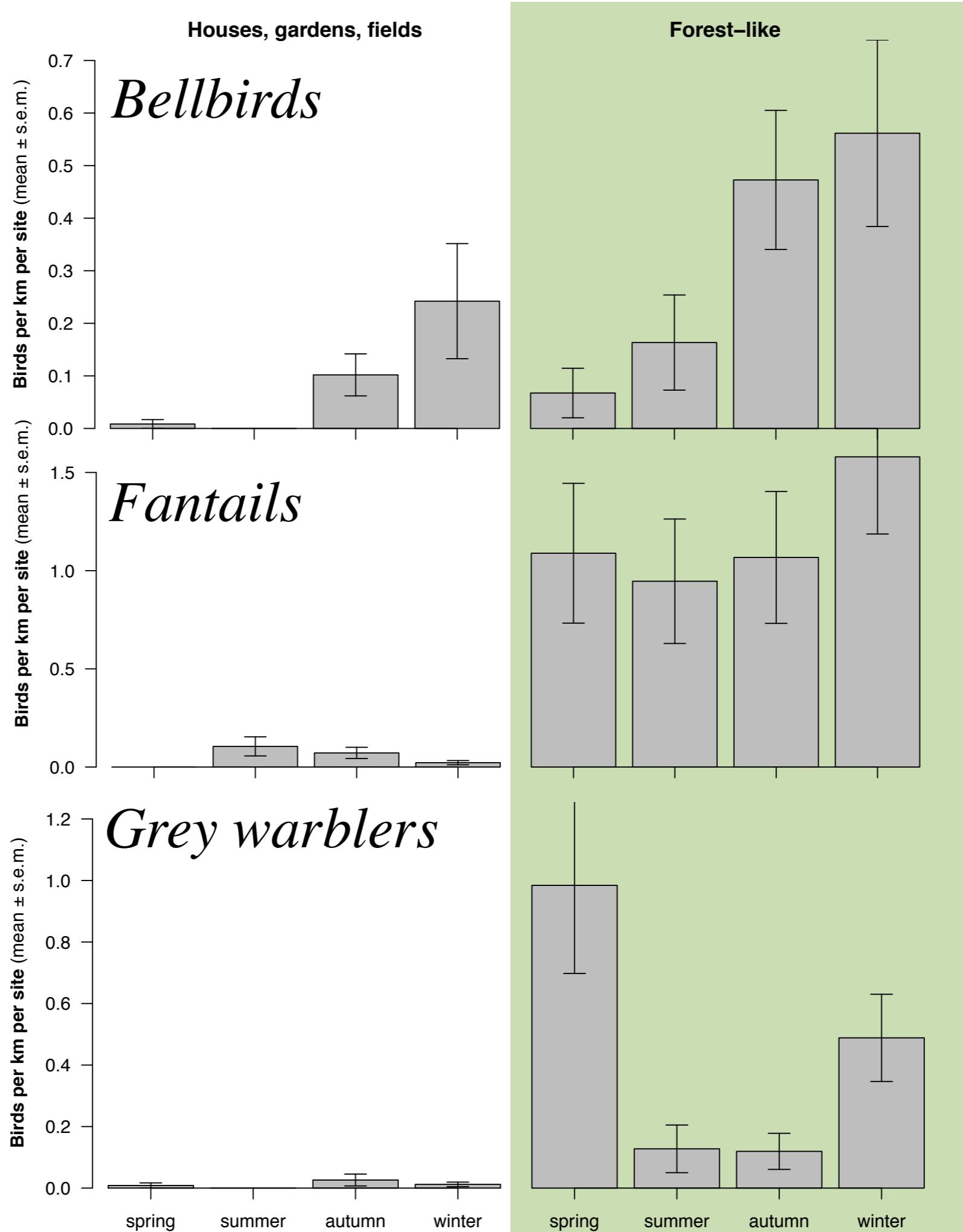


Fantails also prefer farmland over suburban houses and gardens.  
The same pattern applies to my other two less frequently biked routes.

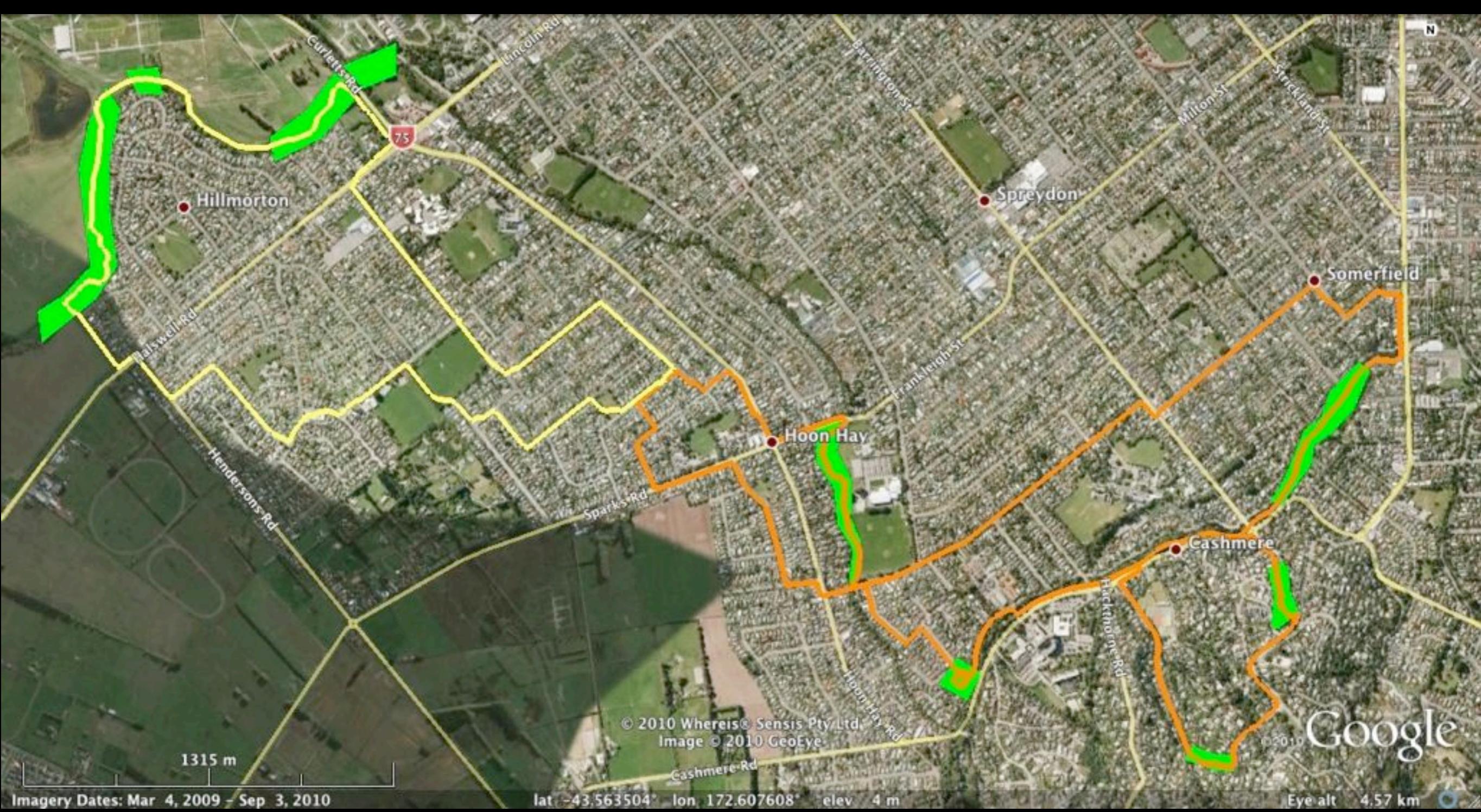
# *Grey warblers*

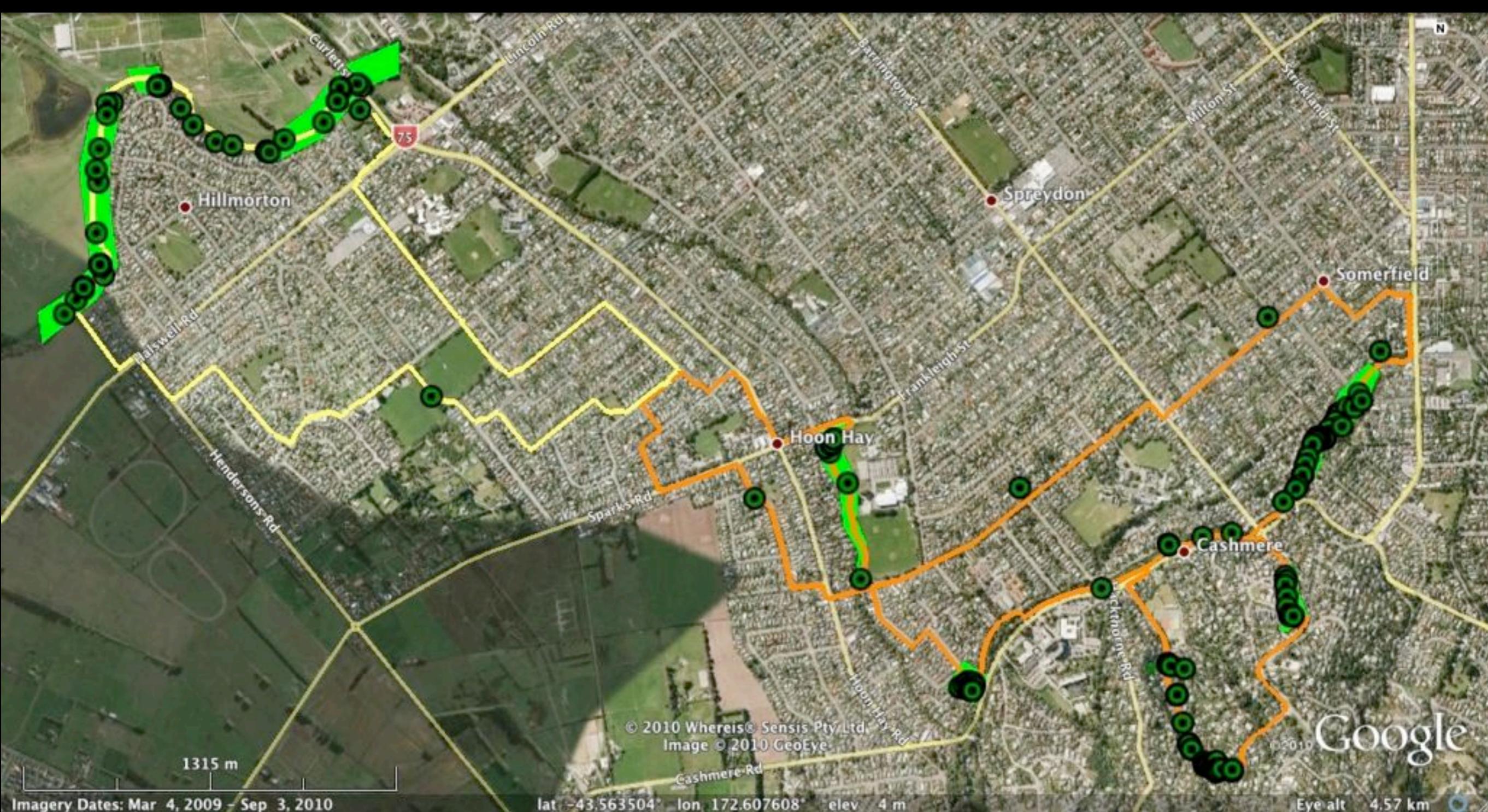


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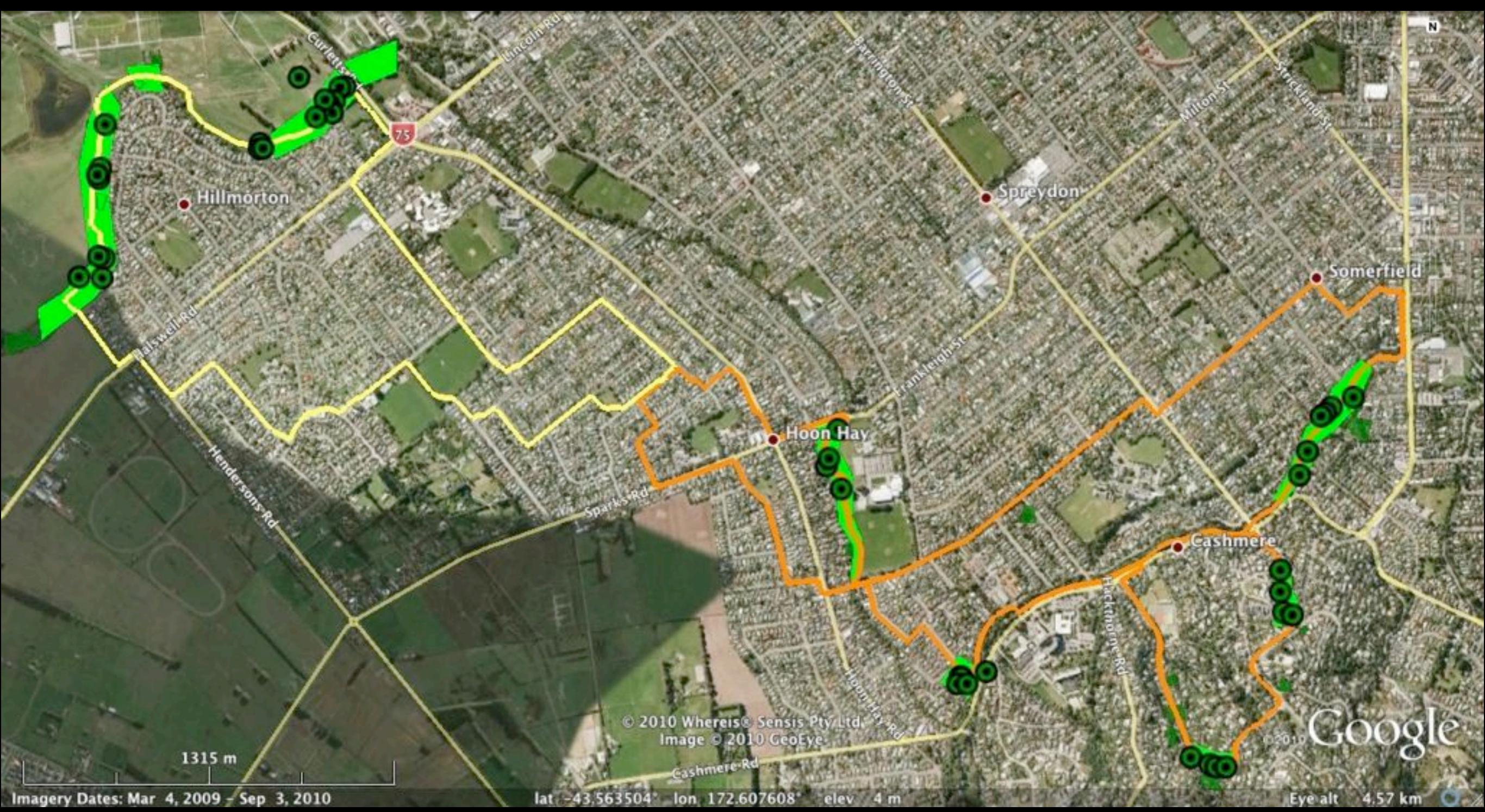


Note that the farmland numbers on the previous slide were similar to the numbers on the left of this graph. Farmland is far worse as a habitat than these forest areas in Christchurch,





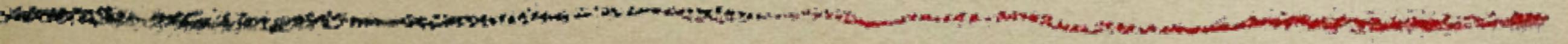
*Fantail*

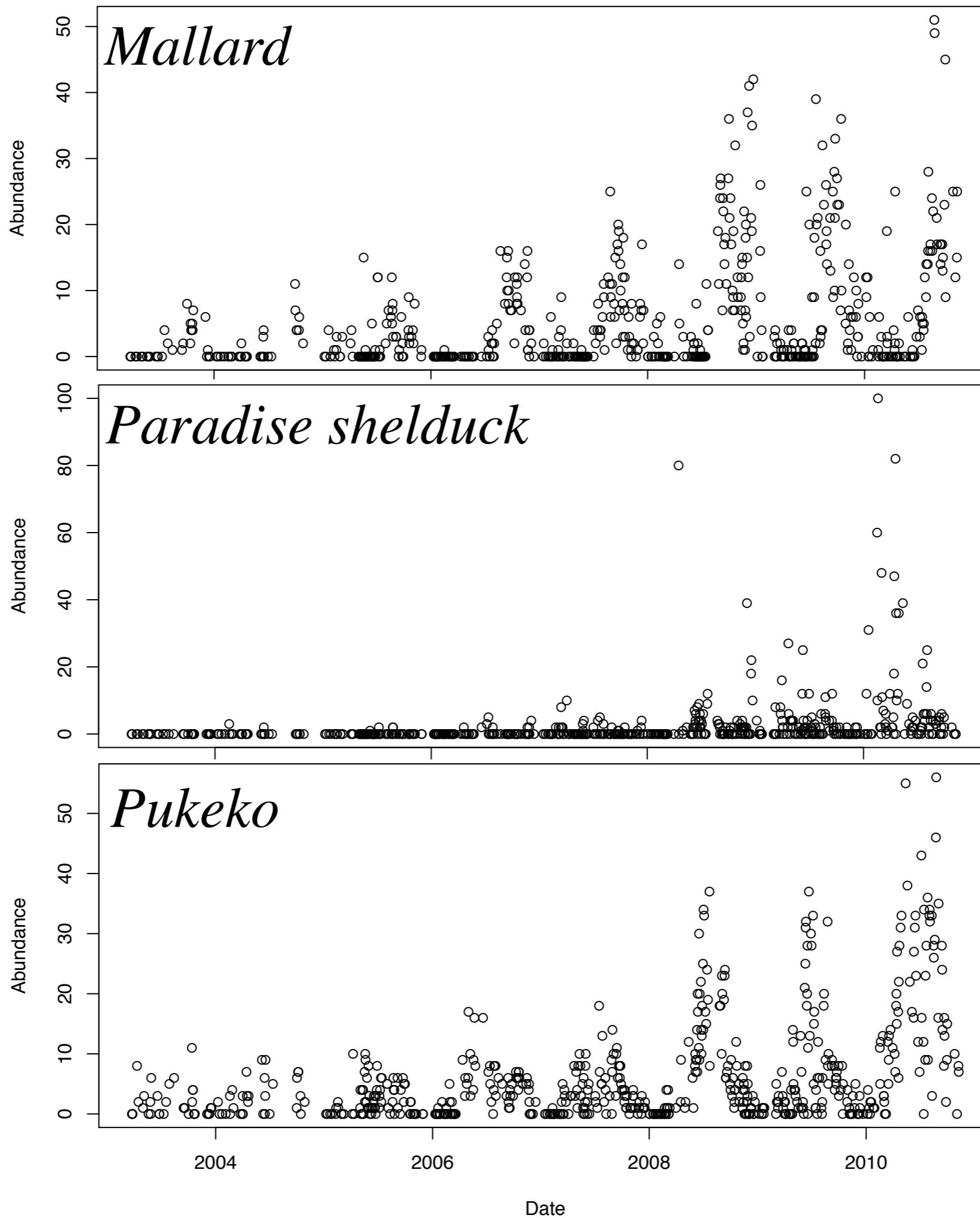


## *Grey warblers*

Mention Yolanda and colleagues from Otago  
van Heezik, Y., Smyth, A., and Mathieu, R. 2008. Diversity of native and exotic birds across an urban gradient in a New Zealand city. *Landscape and Urban Planning*, 87:223–232.

How stable are populations across  
years?



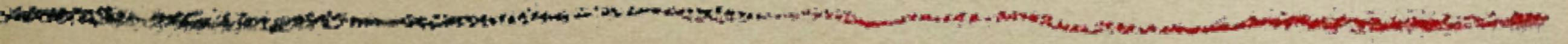


Wetland birds are on the increase. The ratio of thrushes:blackbirds has also increased from ~12% to ~20% (except for 2003 which was similar to the past three years for some reason). Resident birds like harriers and magpies are largely unchanged.  
Point out the seasonal pulses.

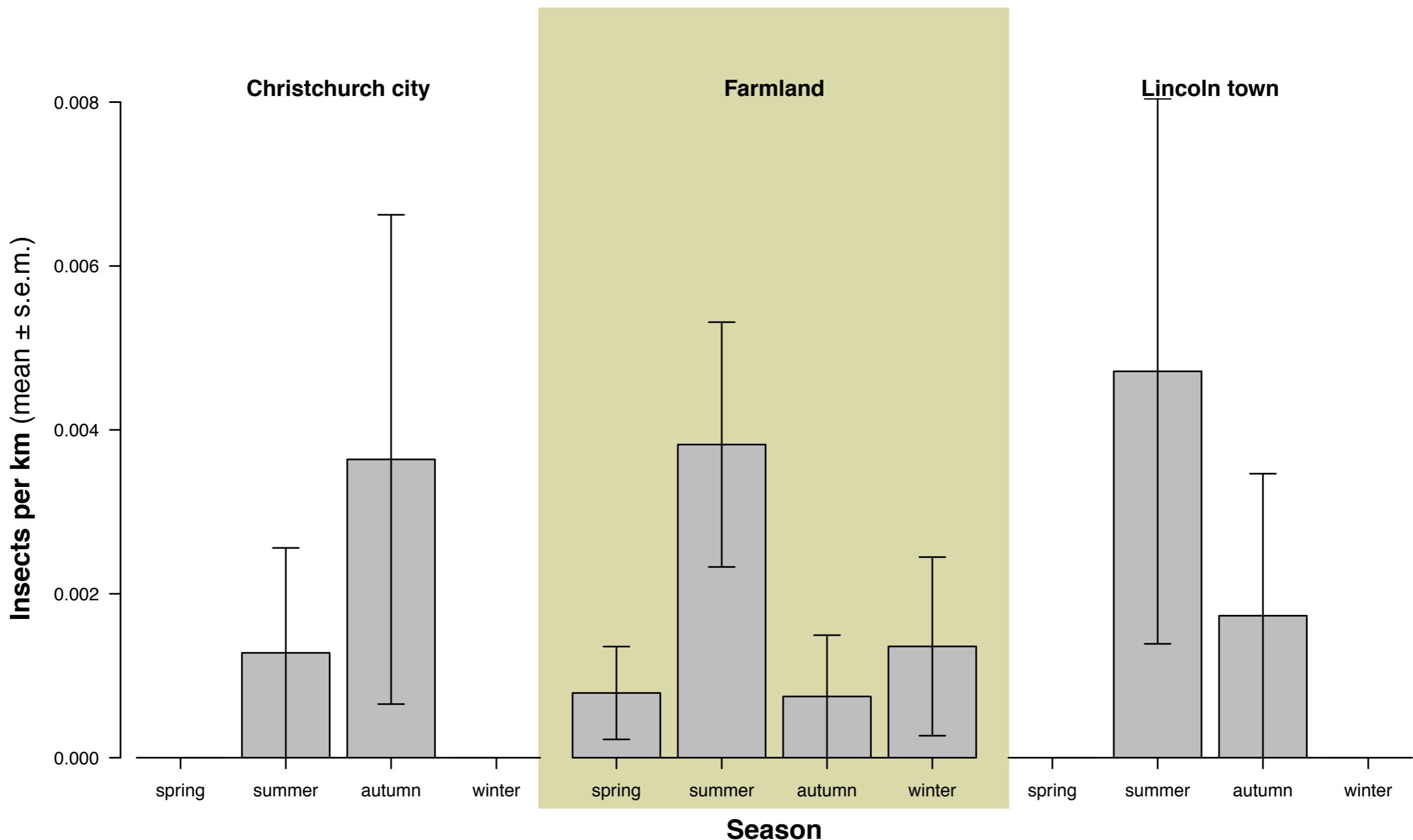


Butterflies (& magpie moth)

# What's better for native butterflies: city or farmland?



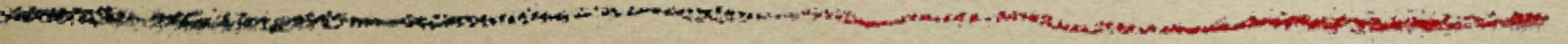
Very little discernible habitat structure in where native butterflies show up.

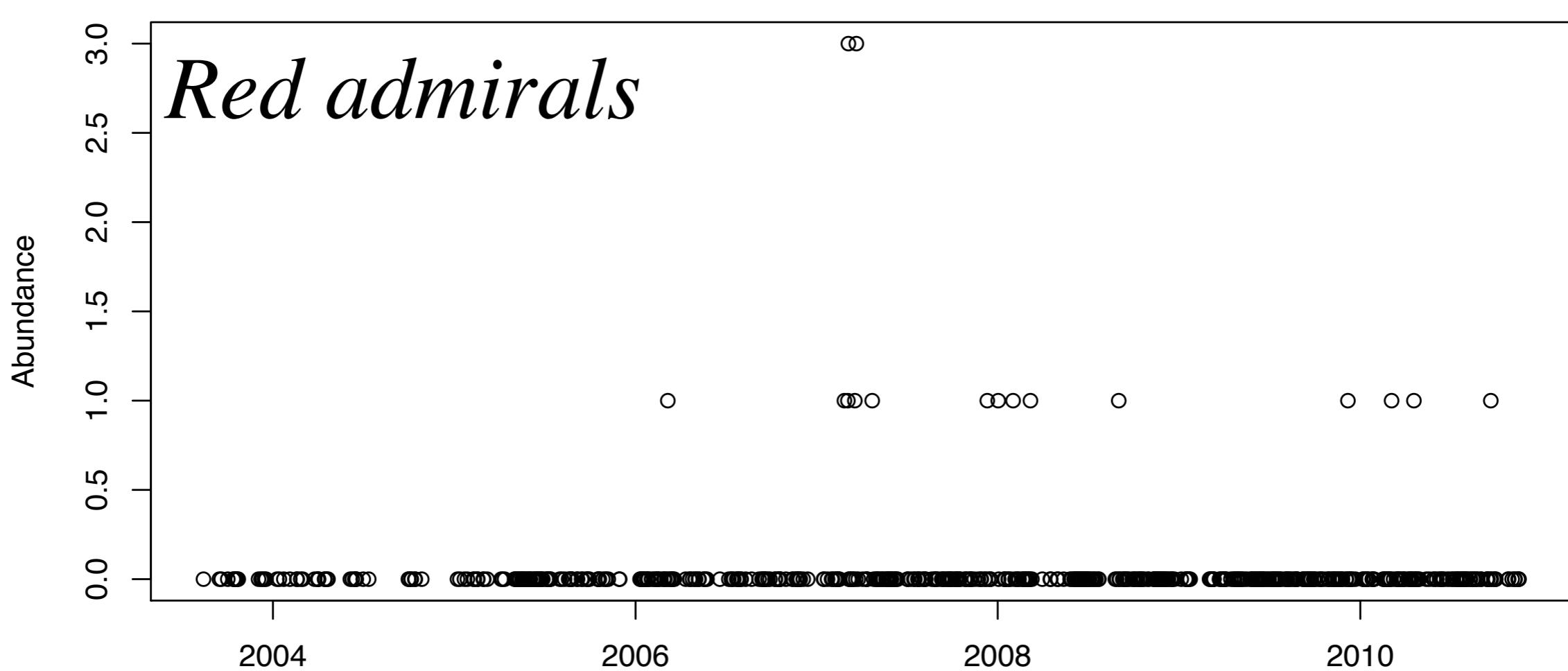
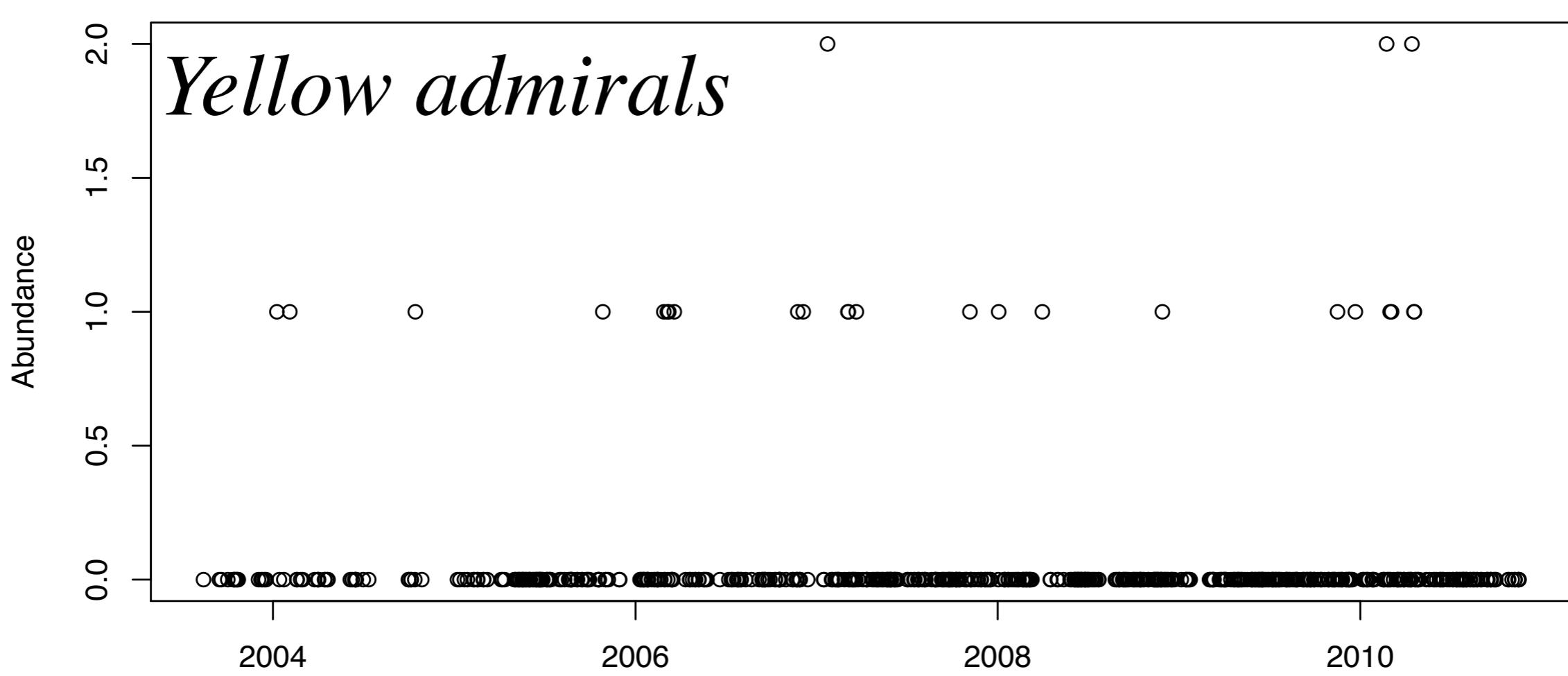


## *Red admirals*

Very little discernible habitat structure in where native butterflies show up.  
 Yellow admirals show the same pattern as shown here for reds.  
 Nyctemera and cabbage whites more common in the farmland.  
 Monarchs more common in the towns.

# Are native butterflies in decline?





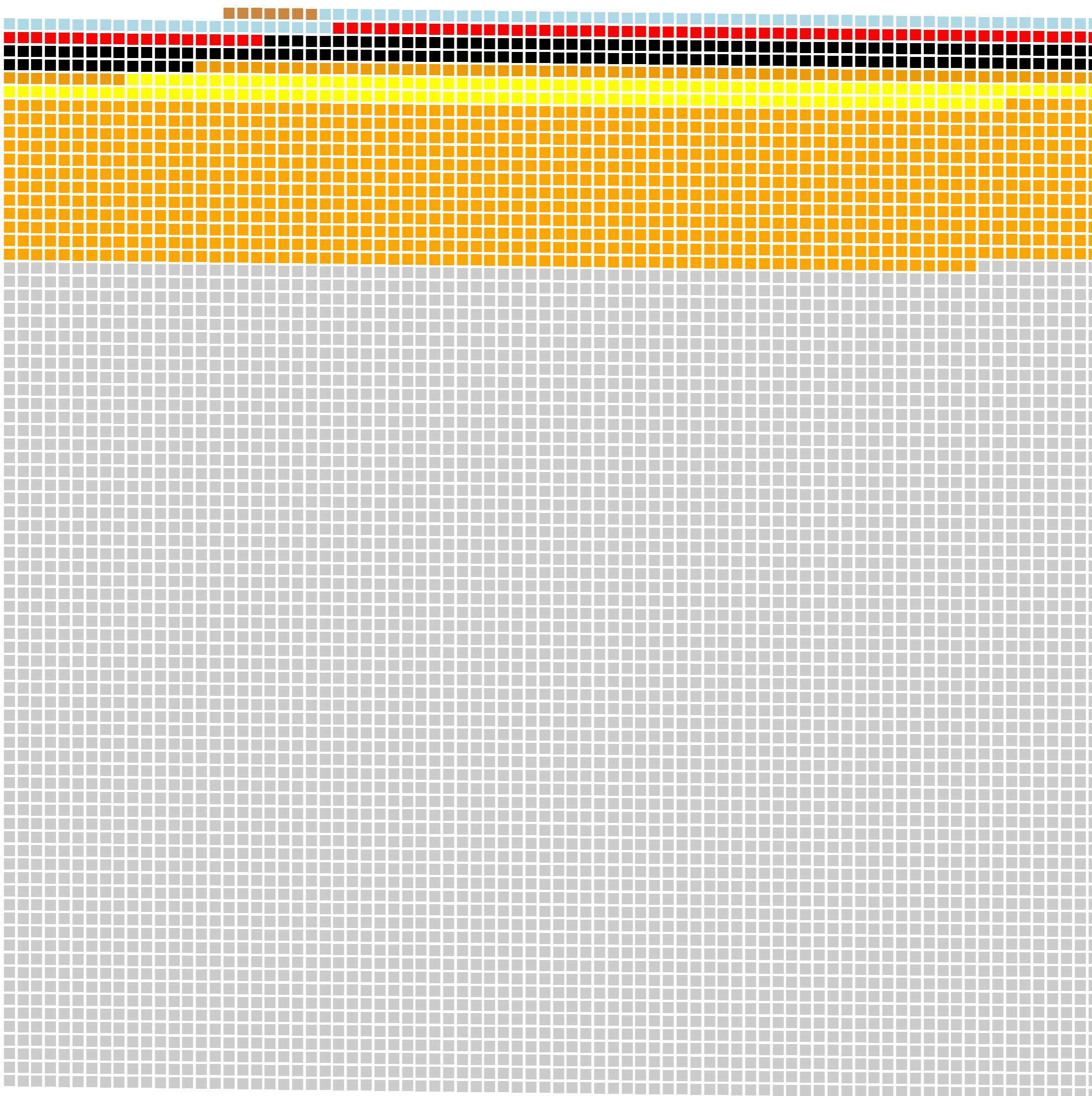
No, but there could hardly be fewer of them to start with. I've seen fewer admirals in total over 650 rides since 2003 than I see cabbage white butterflies in one summer ride.

Red admirals and yellow admirals show a strongly significant seasonal effect but not a year effect.

Same for monarchs (although also significant season:year interaction which I haven't explored).

Same for cabbage whites, which, if anything, show a slight decrease.

Same for cabbage white, monarch, and orange, Nyctemera shows slight significant increase.



Each square represents one butterfly. This is all the butterflies I've seen in and between Christchurch and Lincoln. The light grey are cabbage whites, the orange monarchs, the yellow are yellow admirals, the dark orange are admirals (species unknown), the black are magpie moths, the red are red admirals, the blue are Southern Blues, and the browns are coppers.

Naturalised cabbage white and monarch, the latter solely dependent in Christchurch on planted garden plants, vastly outnumber wild native butterflies. This would be easy to turn around.

## TUNDRA By Chad Carpenter

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AH, MY FAVORITE.  
FRESH ROADKILL  
SERVED ON A  
BED OF ASPHALT.

2-4

Chad Carpenter

What we know from Bob Brockie:  
>90% carcasses are mammals.  
Bridges are blackspots.  
Hedgehogs in North Island have declined steeply.

Brockie, R. E., Sadleir, R. M. F. S., and Linklater, W. L. 2009. Long-term wildlife road-kill counts in New Zealand. *New Zealand Journal of Zoology*, 36:123–134.  
Results of the 1984, 1994 and 2005 road-kill counts are summarised in Table 2. The three most frequent road casualties were possums, hedgehogs and rabbits, plus lesser numbers of cats, hares, rats, ferrets, stoats and a dog. Far fewer birds were counted, of which only mynas, pukekos, harriers and magpies were found frequently. corpses of other bird species were seen only once.

Hedgehogs 1660 km route in February: 1984 (112), 1994 (115), 2005 (21)

HOW old?



Point out that static counts can be misleading because half-lives vary dramatically across taxa.

This carcass is in the middle of a busy Halswell Road, between Sparks Road and Halswell School. It was killed in September 2009, over 11 months old at the time of the photo. It's still there at 15 months old. And that's after one of the wettest winters in Christchurch in the past 30 years.

# Lots of little birds.

	<i>Brockie, Feb. 1984, 1994, 2005 <math>3 \times 1660 \text{ km}</math></i>	<i>Sullivan 2003–2010 <math>665 \times 17 \text{ km}</math></i>
<i>Mammals</i> <i>Carcass per km per trip</i>	<b>0.29</b> (94.3%)	<b>0.035</b> ( <i>Feb: 0.041</i> ) (26%)
<i>Birds</i> <i>Carcass per km per trip</i>	<b>0.017</b> (5.7%)	<b>0.10</b> ( <i>Feb: 0.055</i> ) (74%)

I've now surveyed a twice the distance that Bob did.

Point out that lots of roadkill are in the grass on the roadside, hard to see from a car. Even from a bike, undoubtedly some carcasses stick to cars, get scraped away or scavenged immediately, or injured birds die nearby in shelter.

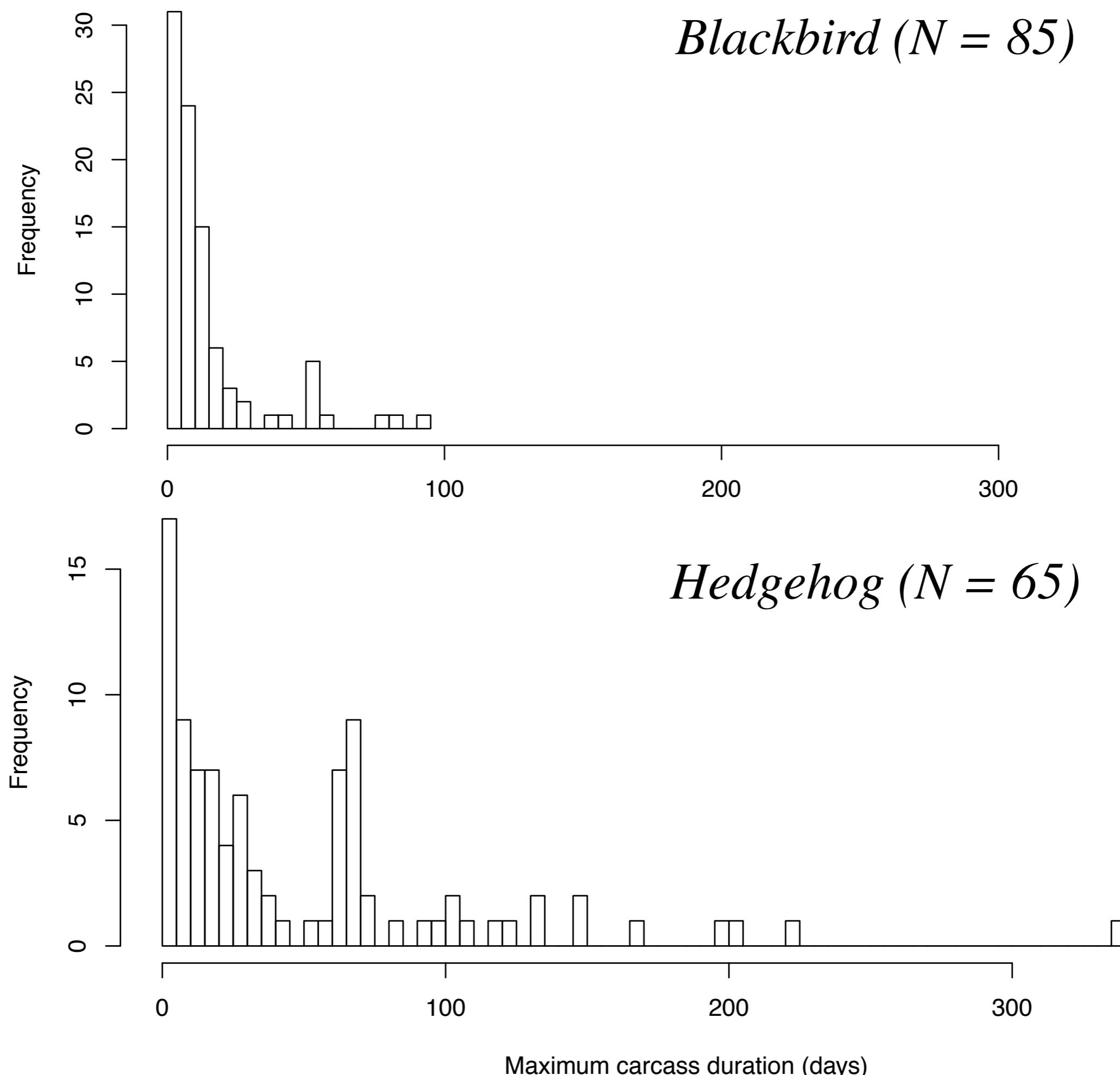
Bob also counted all roadkill, regardless of age. This strongly biases counts towards the longest persisting carcasses (mammals, especially hedgehogs).

Also, by surveying in February, Bob missed the spring peak in bird kills.

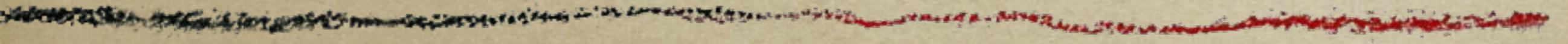
My data (bike rides, 626 (Ladbrooks) + 17 (Prebleton) + 23 (Tai Tapu) N = 665):  
 1129 birds  
 396 mammals

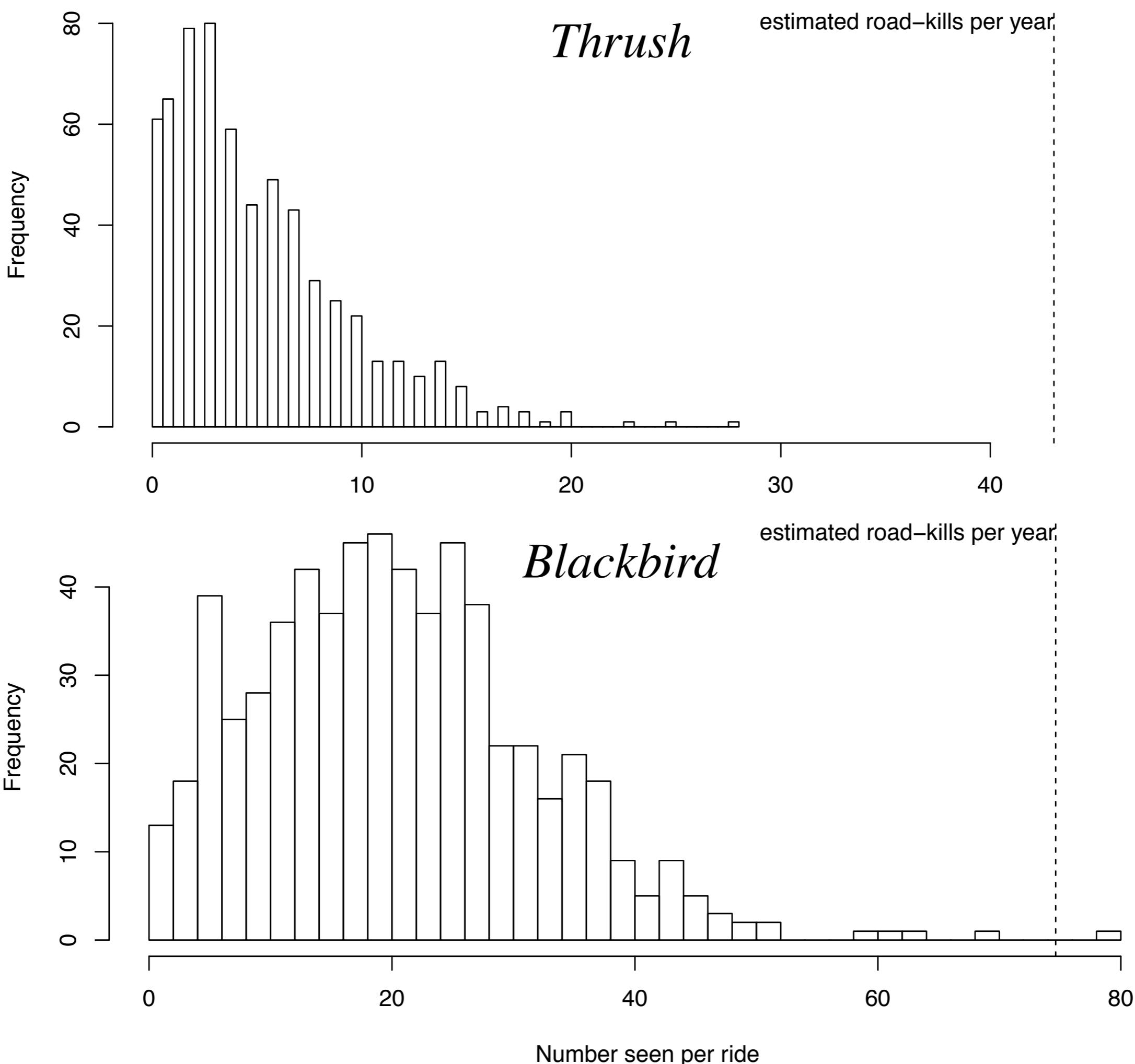
February only (45 rides):  
 42 birds  
 32 mammals

*Blackbird* ( $N = 85$ )



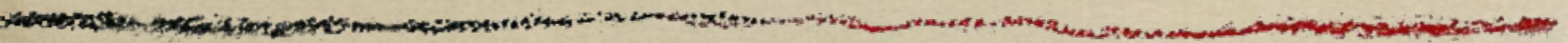
What proportion of birds seen in a  
year are killed by cars?





137 fresh blackbird roadkills  
79 fresh thrush roadkills  
in 670 rides

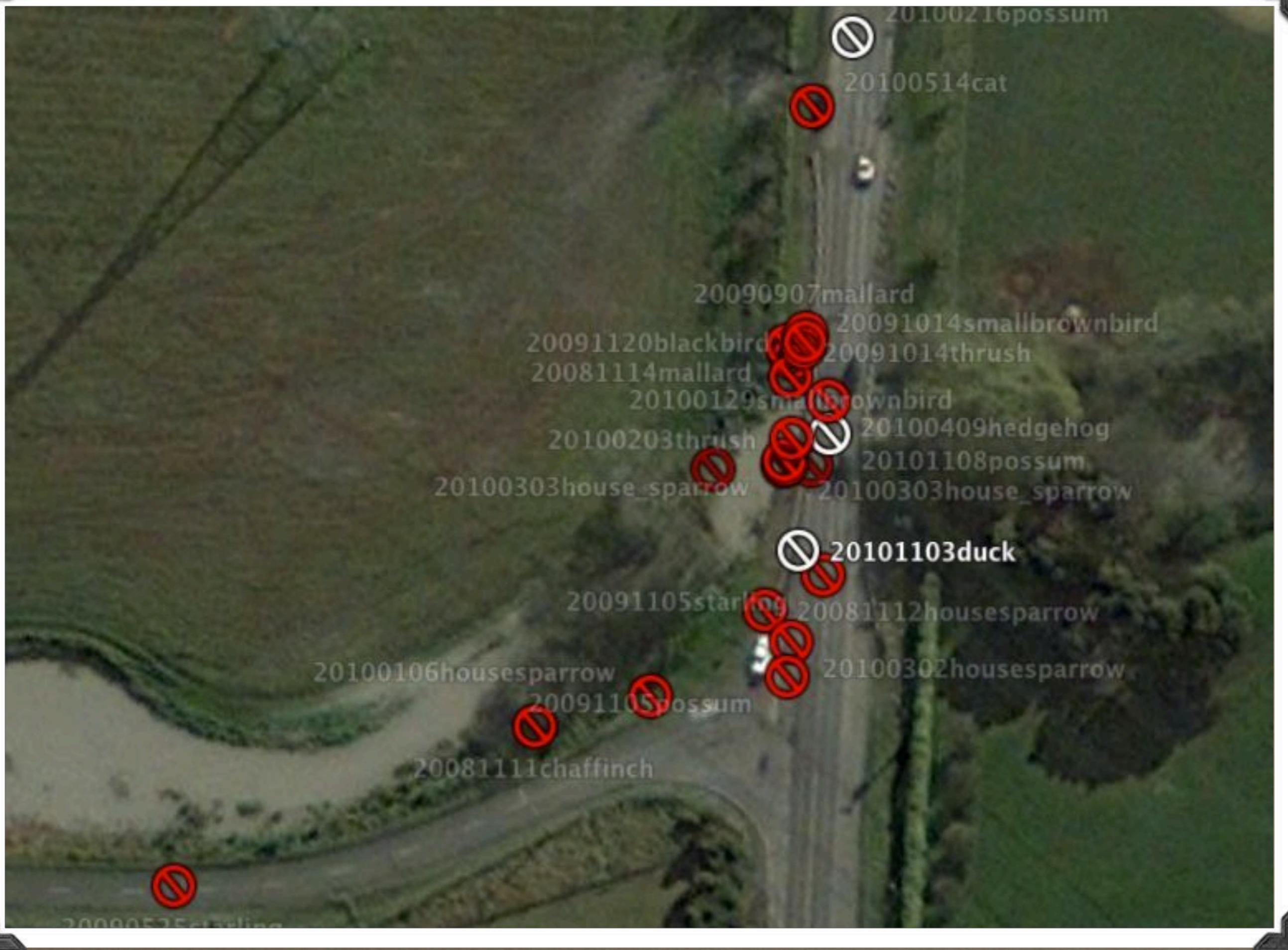
# Ask me and it's yours to play with.



- *Jon.Sullivan@lincoln.ac.nz*

Repeat that this is just a preliminary look at the data. If anyone wants to have a go at it, I'm happy to give it all away in exchange for authorship. Just email me.

> 58000 bird records from bike ride



Bob Brockie noted that bridges kill. So do perpendicular shelterbelts and hedgerows. You could argue that birds will cross the road somewhere regardless and so changing hedgerow orientation wouldn't change roadkills. I'd argue that most birds (especially adults) have their wits about them most of the time and would see a car coming if crossing in open space. See if disproportionately more kills are on the down-traffic side of these barriers.



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