

# Preliminary analysis of the Icelandic Gyrfalcon CMR dataset

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Here I attempt to explore the CMR dataset, before we go to inferential models to estimate survival and perhaps link this to an integrated pop. model.

## Basic statistics

How many birds have been ringed?

```
dringed<-read.csv("Gyrs_ringed.csv")
head(dringed) # What's in the data table
```

##	Program	RingNo	Species	ColourRing	RingerCode	Ringer
## 1	REYK	14499	Fálki		32	Finnur Guðmundsson
## 2	REYK	2451	Fálki		62	Helgi Þórarinnsson (eldri)
## 3	REYK	2452	Fálki		62	Helgi Þórarinnsson (eldri)
## 4	REYK	2453	Fálki		62	Helgi Þórarinnsson (eldri)
## 5	REYK	32671	Fálki		88	Hallgrímur Sæmundsson
## 6	REYK	21602	Fálki		97	Tryggvi Eyjólfsson
##	RingDate	SiteID	AgeCode		Age	SEX
## 1	7/31/1954	3376	202		Eldisungi	0
## 2	7/8/1940	703	101	Ófleygur ungi í hreiðri		0
## 3	7/8/1940	703	101	Ófleygur ungi í hreiðri		0
## 4	7/8/1940	703	101	Ófleygur ungi í hreiðri		0
## 5	9/28/1943	3437	460	Fullvaxinn (1. árs+)		0
## 6	9/12/1958	1743	100	Ófleygur ungi		0
##						Notes

```

24 ## 1 Tekinn úr hr. alinn til útflutnings á Ystafelli, S-Þing.
25 ## 2
26 ## 3
27 ## 4
28 ## 5
29 ## 6

```

```
length(unique(dringed$RingNo)) #How many unique bird IDs
```

```
30 ## [1] 1738
```

31 OK, so we have a little more than 1700 unique IDs. Isn't this much compared to the total population?

32 Let's compare to how many gyrs have been recovered.

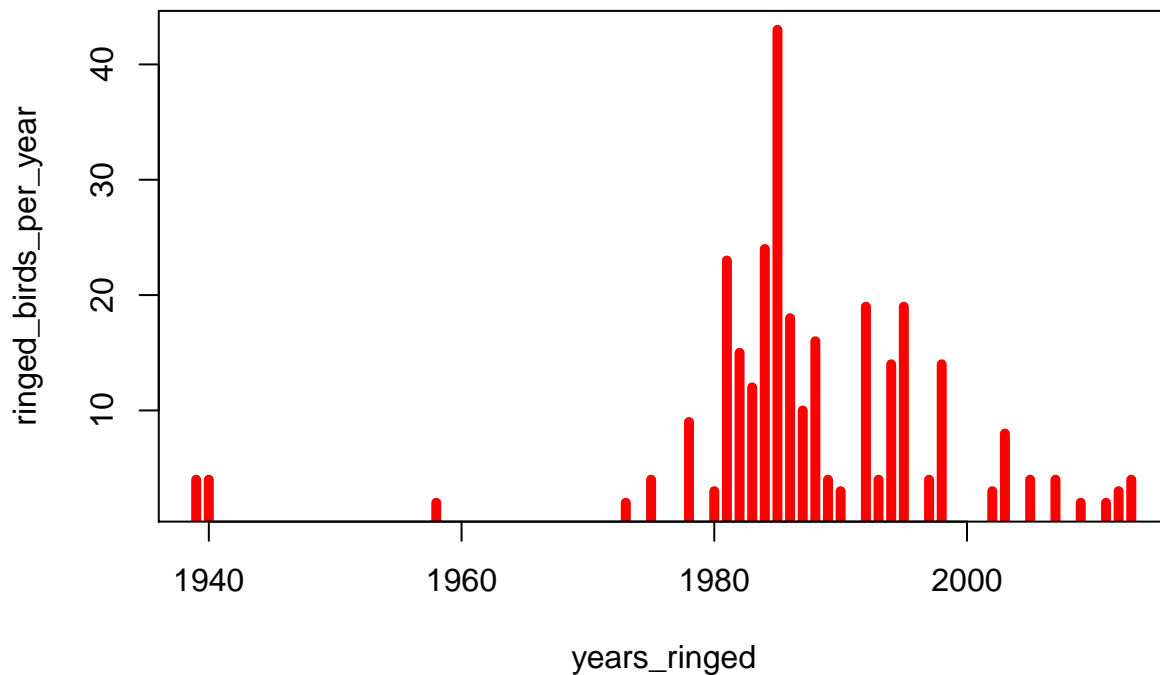
```

drecov<-read.csv("Gyrs_recovered.csv")
length(unique(drecov$RingNo)) #How many unique bird IDs in Gyrs_recovered.csv

```

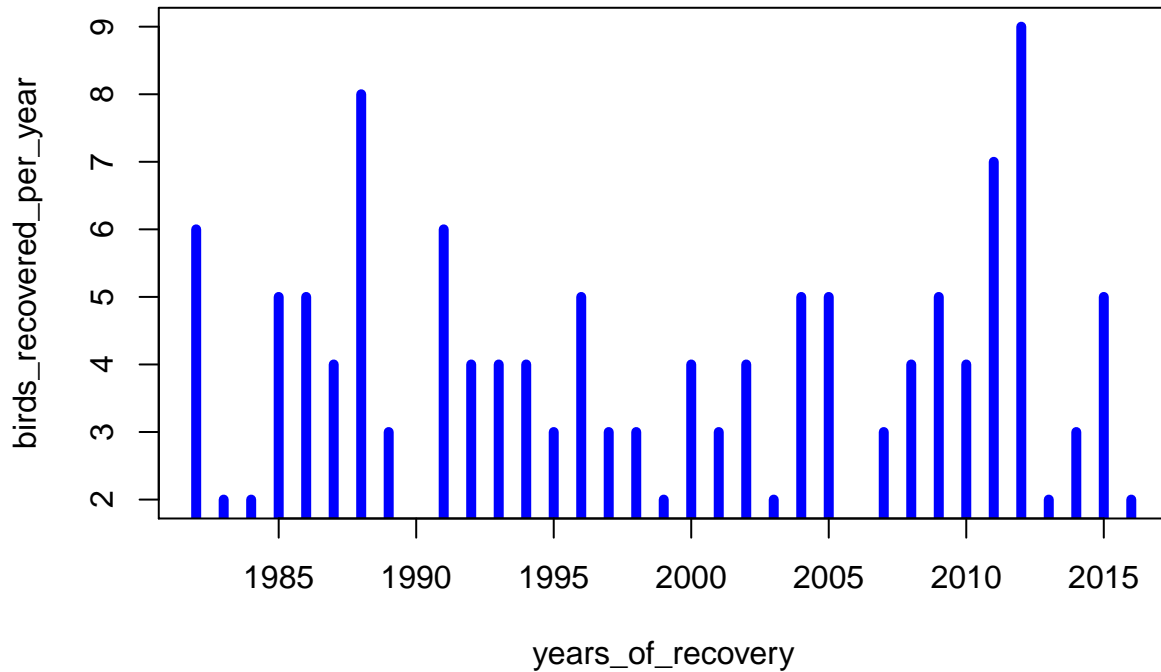
```
33 ## [1] 274
```

34 Let's now analyse the number of birds that have been ringed as a function of the year



```
35
```

36 We now analyse the patterns of recovery (and resighting)



37

38 Now how many birds have been seen several times? We see below that very few birds have been recovered  
 39 more than once (also this tends to be recent?).

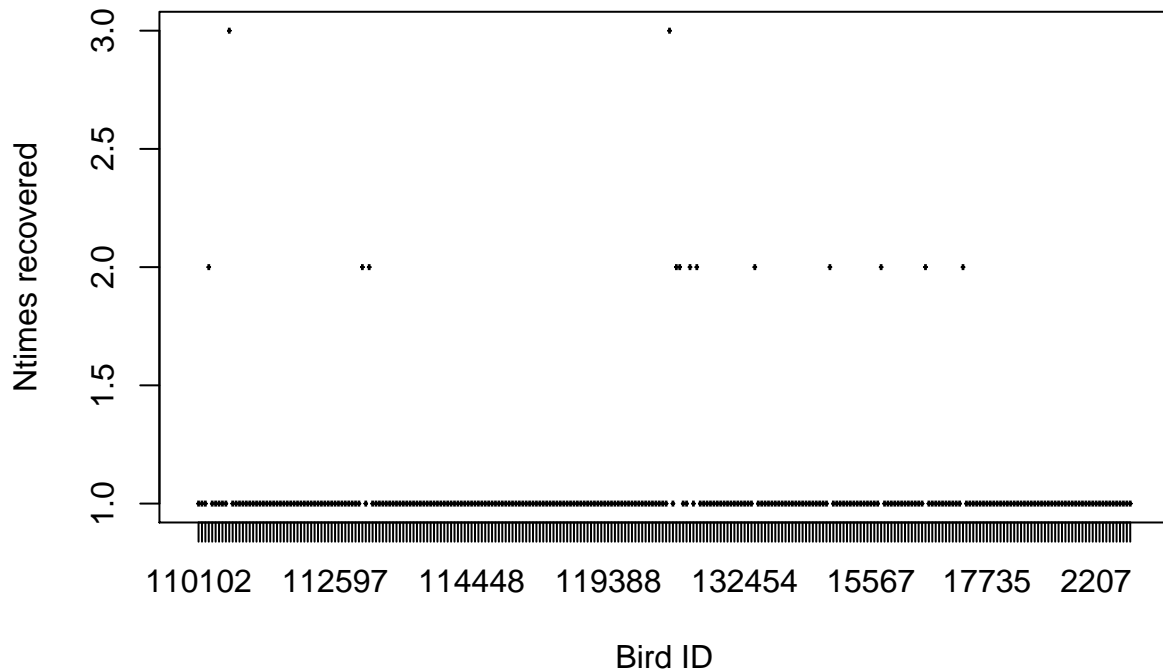
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**Question: when did the change from recovery of dead birds to resighting of live birds occur?**

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40 I can infer the earliest date at which a bird has been resighted a second time, but given few birds have been  
 41 resighted, but it might be preferable to allow later for a change in protocol (in the CMR models) using a  
 42 predefined time (we can use several if unsure). I have noted 2006 earlier but I am unsure.

43



44

```
45 ## ntimes_recovered
46 ##      1      2      3
47 ## 260    12      2
```

48 Thus for all practical purposes, we can consider that such data consists mainly of individual that are either  
 49 recovered or not recovered/resighted. We'll now turn to whether the individuals have been found live or dead,  
 50 and how this varies in time.

51 Also whether the recoveries of dead birds are of young vs. adult birds (which may provide quick and dirty  
 52 estimates of survival rates, at least for the youngs...)

```
table(drecov$RecoveryCode) ## these are all the recovery codes that we have (top row), and how many of
```

```
53 ##
54 ##      0  100  110  115  116  117  118  119  120  121  122  123  124  125  130
55 ##      3   23    7    8    3    5    4   17   26    4    1    7    2    2    4
56 ## 131  146  190  210  216  226  291  292  296  352  605  620  621  622  625
57 ##      2   21    6    1    1    2    5    1    1    1    1    4   10    3    2
58 ## 626  630  631  632  633  635  641  643  644  650  651  680  761  805  810
59 ##      2    4    3    2    1    1    1    1    1    1    1    1    1    1    1
```

<sup>60</sup> ## 820 852 870 981 982 995 996 1030 1031 1035 1080 1085 1086 4500 4800  
<sup>61</sup> ## 1 5 1 2 6 4 6 3 2 2 1 2 1 2 1  
<sup>62</sup> ## 4820 5600 5601 5621 5700 6000 6220 6280 6281 6400 6500 6510 6800 6810 6815  
<sup>63</sup> ## 1 3 1 2 15 3 5 1 6 1 2 1 1 2 2  
<sup>64</sup> ## 6860 6871 6872 6873  
<sup>65</sup> ## 2 1 1 2

<sup>66</sup> *Now we need some more info on the codes, I'm attempting below to fill this gap but may need some help*

AGE Code	Meaning
100	unfledged young
101	unfledged young at the nest
501	adult at the nest

RECOVERY Code	Meaning
100	found dead
120	found dead for a long time
121	found dead with one tag only?
146	found dead just outside the nest
5700	read colourmark
981,996	found injured and had to kill it