

EURASIAN
OTTER
WORKSHOP
26-28 February 2021

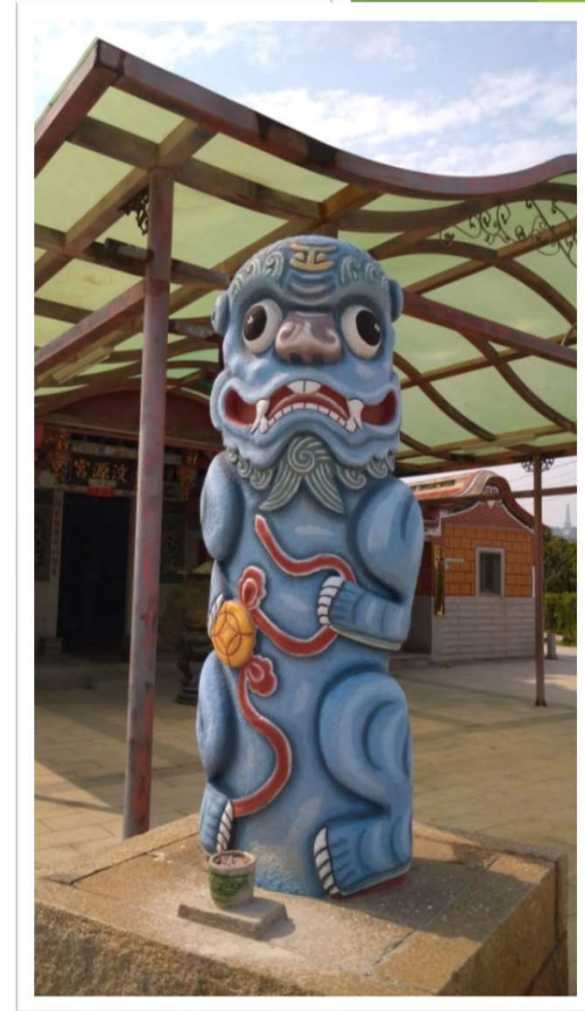


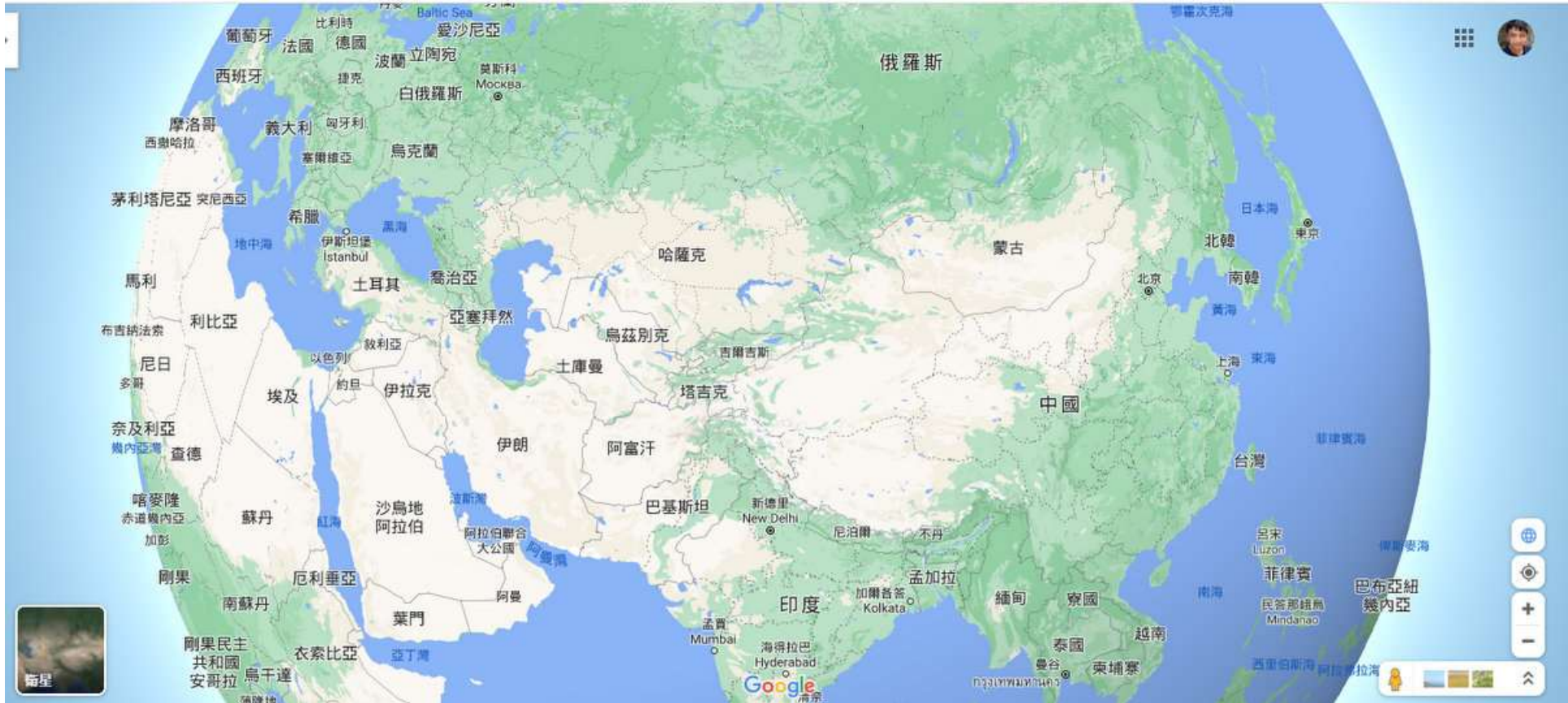
Population Dynamics of Eurasian otter in Kinmen Island, Taiwan

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Taipei Zoo

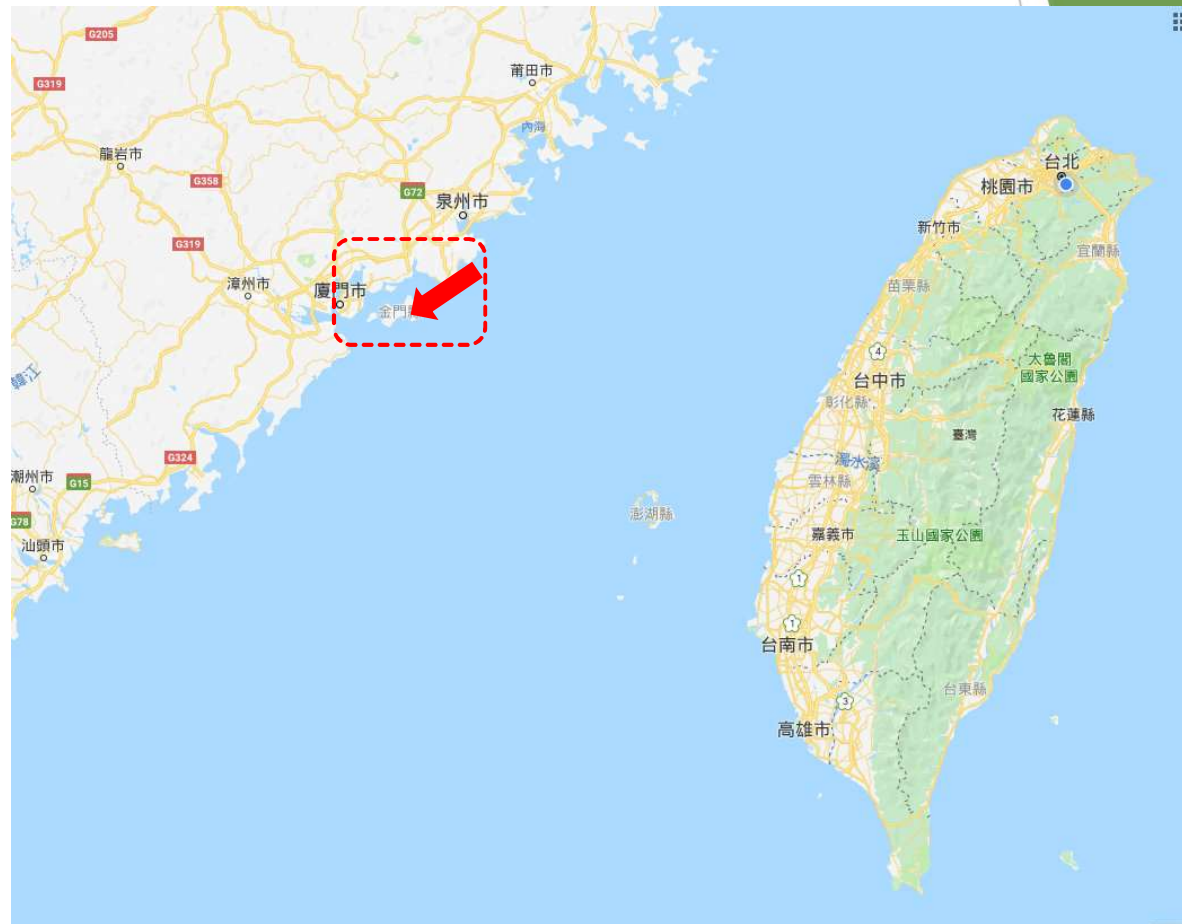
Outlines

- ▶ Introduction to Kinmen Island
- ▶ Kinmen otters in trouble
- ▶ Action for *in situ* conservation in Taipei Zoo (TPZ)--Survey project on Kinmen's population
- ▶ Populations of nearby area
- ▶ Our vision on Kinmen otter conservation.

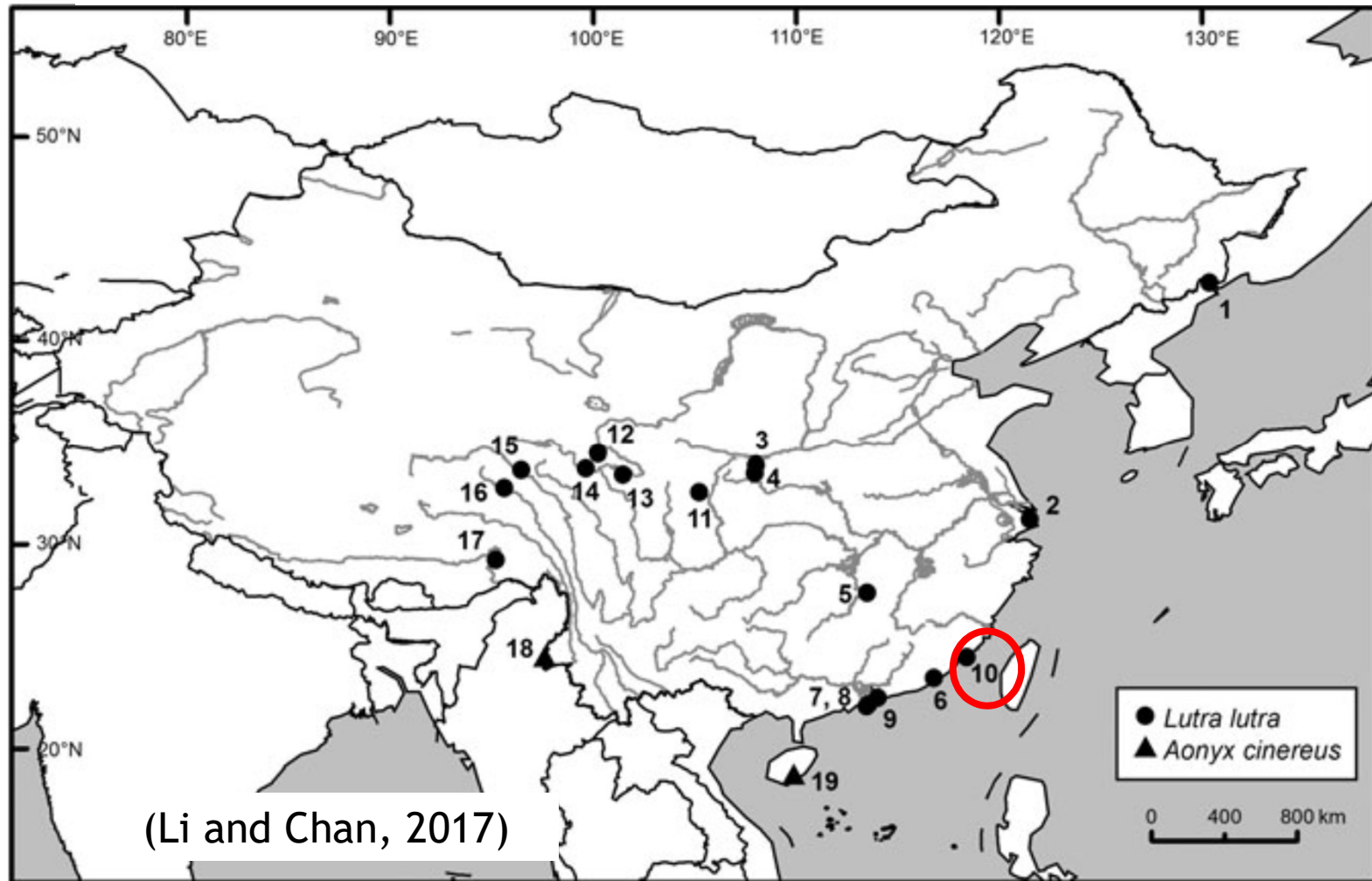




Where is Kinmen?

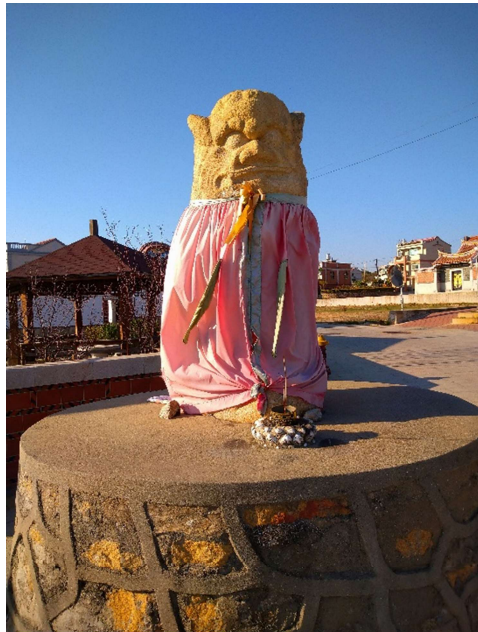


2006~2016 records in China and Taiwan



What is Kinmen?





Why Kinmen?

- ▶ Battle front (1958-79)
- ▶ Military control zone for decades
- ▶ Extremely guns control
- ▶ No professional hunter
- ▶ Artificial ponds for military needs
- ▶ and....Tilapia





Kinmen otters in trouble

- ▶ *Habitat destroyed*
 - ▶ Overuse of lands
 - ▶ Artificially environments
 - ▶ High density of roads
 - ▶ Isolation of habitats





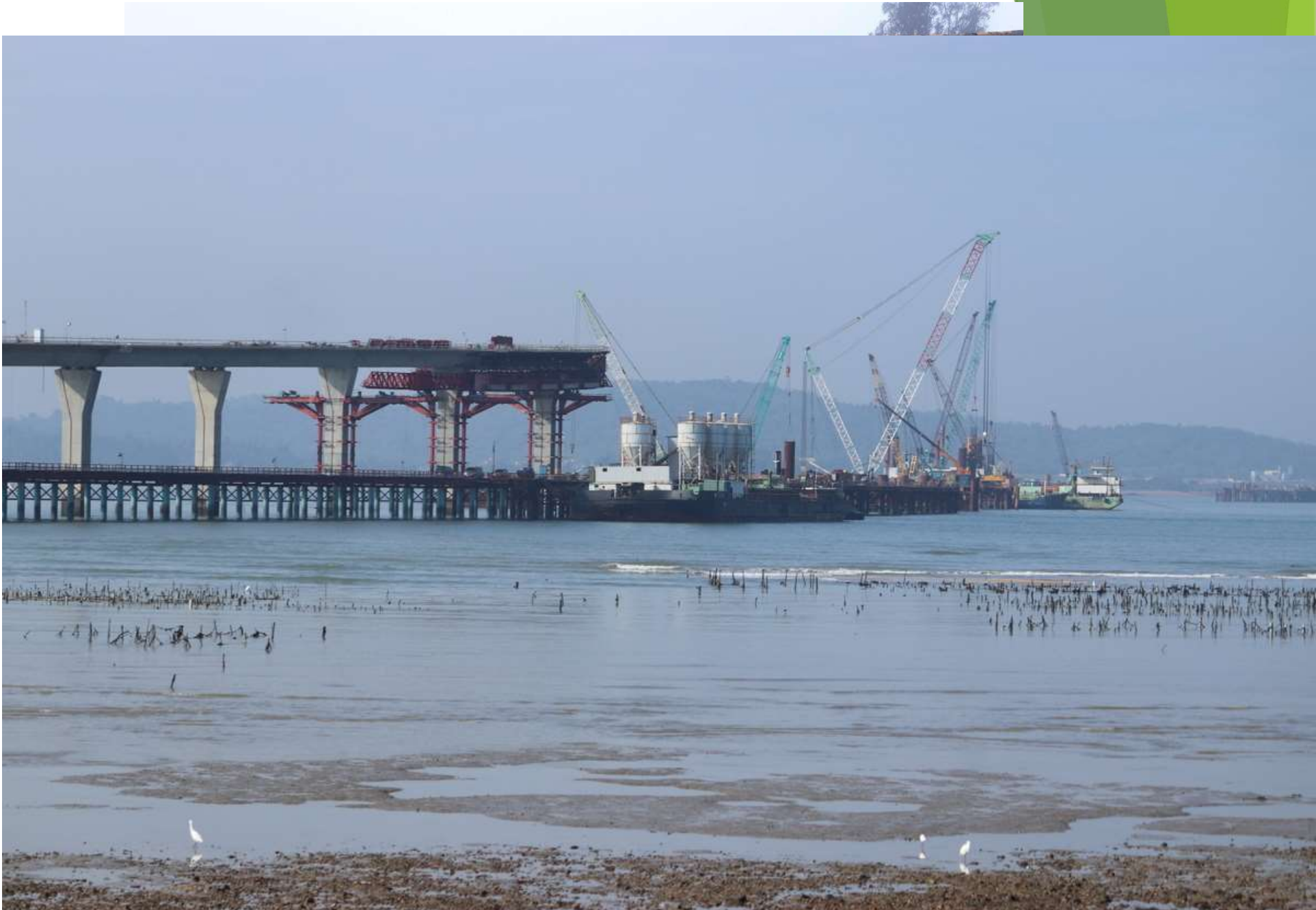
Artificially environments









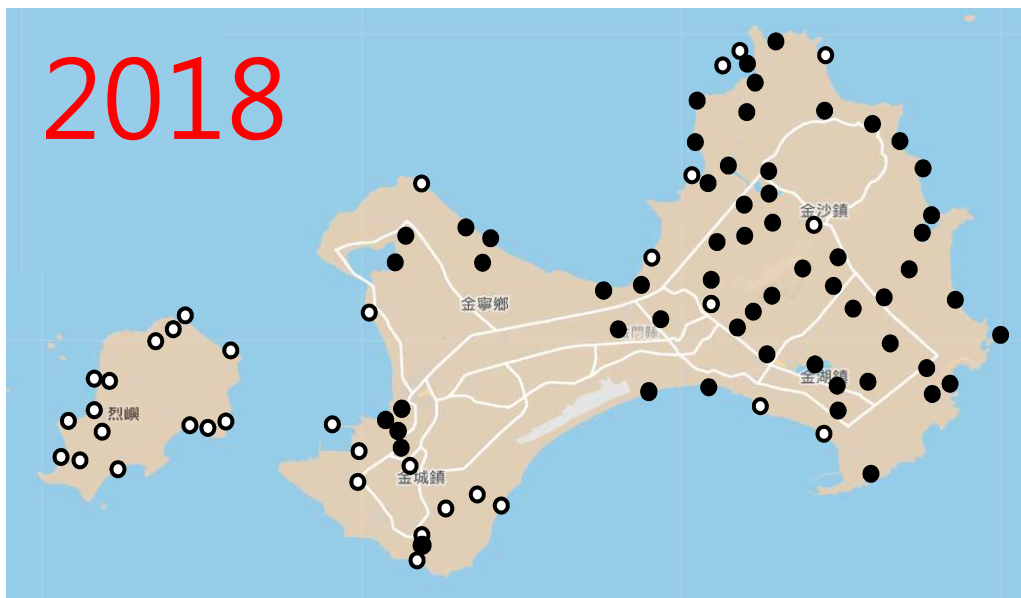


2003



- ▶ 3 surveys : Apr., July, Aug.
- ▶ Black=present ;
- ▶ White=absent
- ▶ 84%(37/44) sampling sites were recorded with otter fecals

2018



- 4 surveys : Feb., May, Sep. Dec.
- Black=present ;
- White=absent
- 63%(58/92) sampling sites were recorded with otter faecals

Eurasian and Taipei Zoo



Feb. 2014-2 male cubs

June 2014-1 female cub rescued

Eurasian and Taipei Zoo



Feb. 2018-2 new cub

born in TPZ

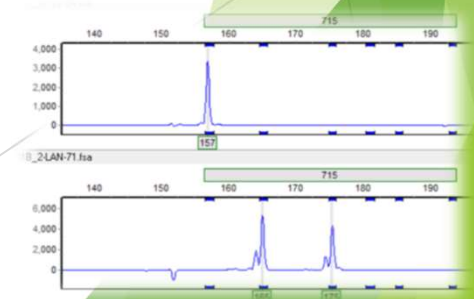
Goals for Kinmen otter *in situ* conservation project of TPZ

- Survey project on Kinmen population
- Environmental improvement suggestion
- Rescue mission/roadkilled cases
- Education projects on otter conservation to public of Taiwan/ Kinmen
- Nearby population?

Methods

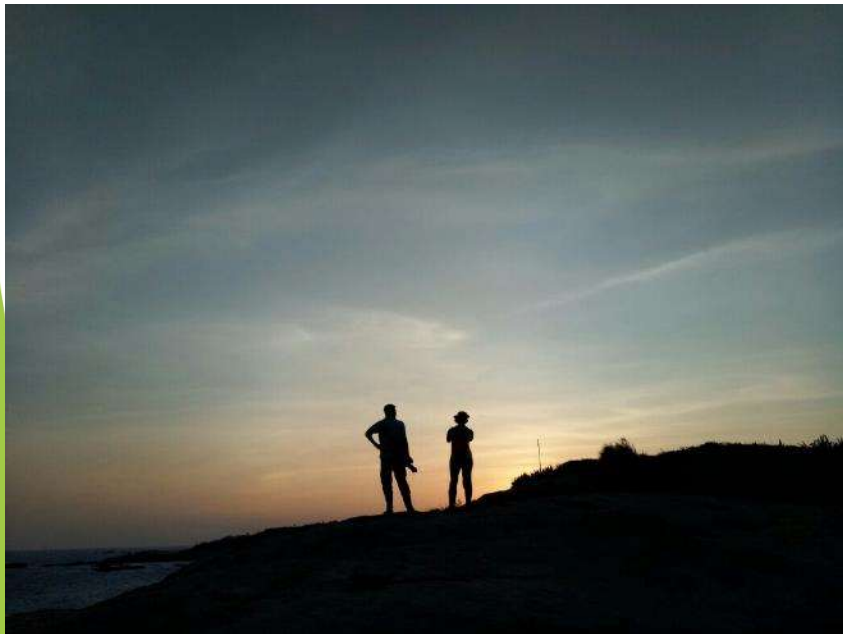
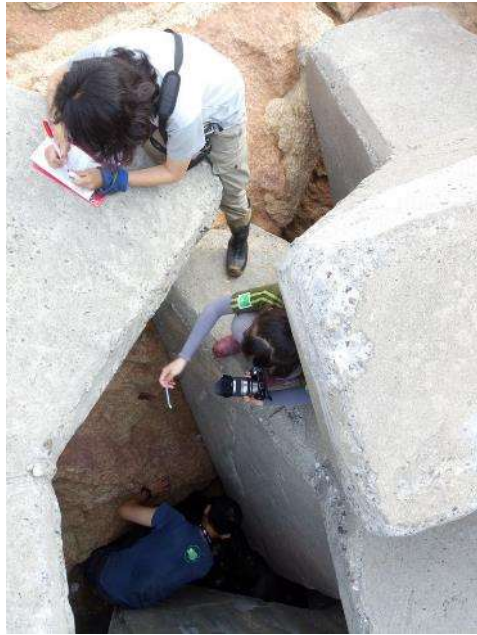


- ▶ 2016-2021~
- ▶ Faecal (spraint) samples were collected since 2013
- ▶ Using mtDNA **ND5**, **cyt b** genes and **control-region** for phylogeny comparison among other Eurasian otters' population
- ▶ Using **15** autosomal **microsatellites** to analyze faecals samples of otters collected from Kinmen Is
 1. Low disturbance to wild population
 2. Expensive and time consuming
 3. Few information from single sample

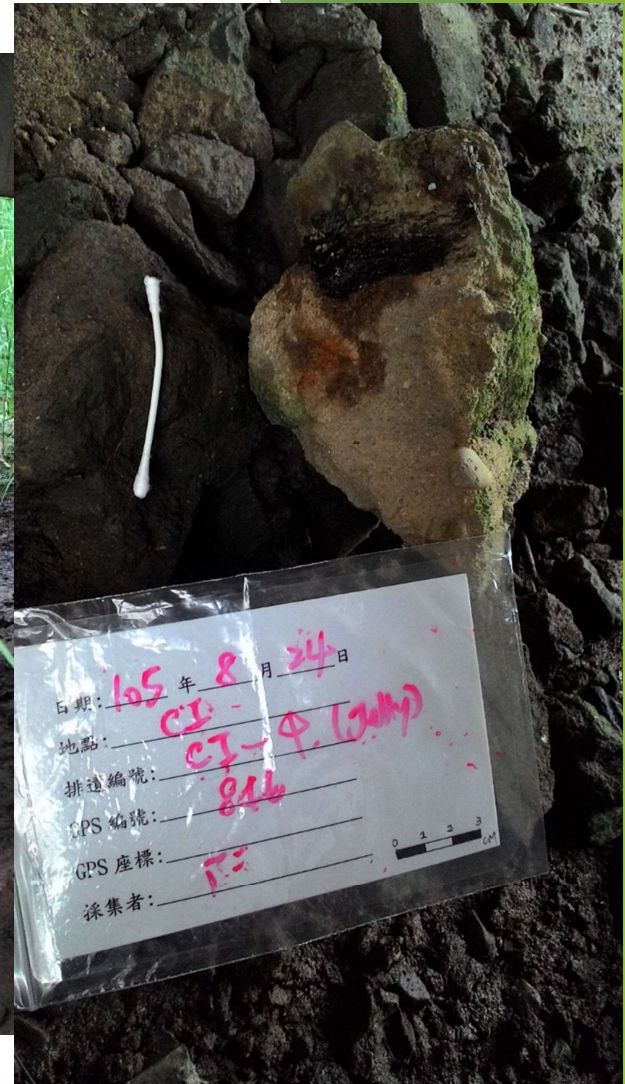


wild collection trip every season











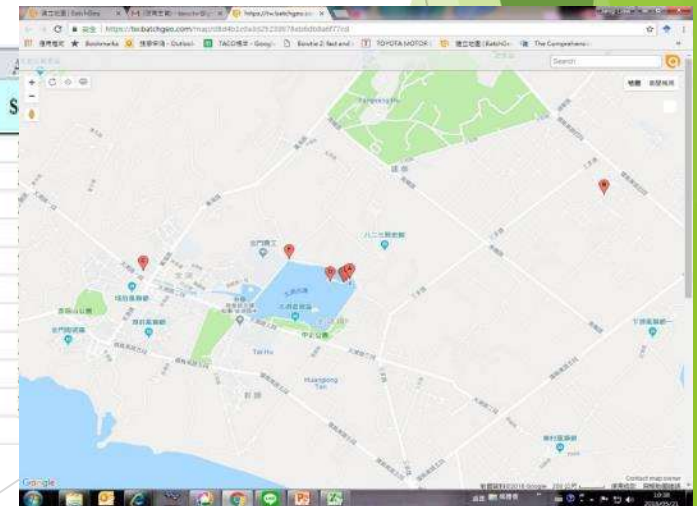




All for a database!

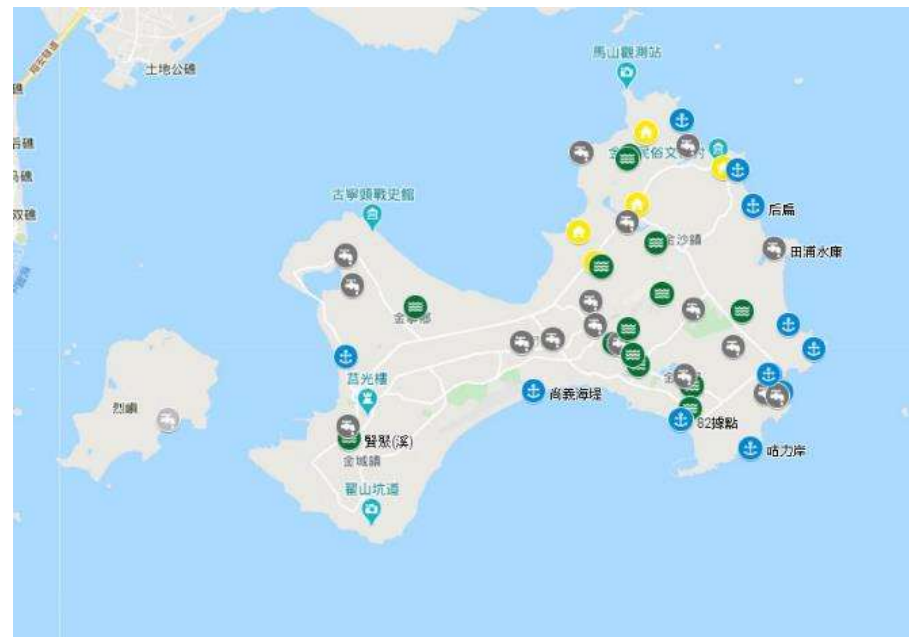
- ▶ To establish a population database over 5 years
- ▶ Recording GPS, individual activity, behavior, habitat use...
- ▶ Discuss the ages, territory, genealogy, population dynamics...
- ▶ Background data for conservation plan in the future, providing suggestions for re-introduction plan and population management

	E	F	G	H	I	J	K	L	M	AA	AB	AC
1	樣區	紀錄日	紀錄時	GPS	GPS時間	緯度	經度	狀態	狀態	篩選	DNA版本	個體編號
378	太湖	2015/1/21	0	869	8:31:36	24.4409	118.42995	1	0	y	0	210
379	太湖	2015/7/7	0	67	07:28:54	24.441	118.43	J	0	y	0	210
380	映碧潭-山外溪	2017/11/18	0	C-118	2017-11-18 8:07:42	24.4477	118.45	1	0	y	0	210
381	映碧潭-山外溪	2017/4/23	05:21	969	2017-04-23 5:25:34	24.441609	118.41273	0	0	y	0	210
382	0	2014/2/15	0	945	07:54:44	24.4408	118.42797	1	0	y	0	210
383	0	2014/2/15	0	939	07:34:22	24.441	118.42959	1	0	y	0	210
384	太湖	2017/4/21	05:40	241	2017-04-21 5:34:14	24.442529	118.42464	0	0	y	0	210
385	0	2014/2/15	00:00	942	07:40:38	24.4408	118.42931	1	0	y	0	210
386	0	2014/2/15	00:00	943	07:43:03	24.4408	118.42913	1	0	y	0	210
387	0	2014/2/15	0	944	07:45:22	24.4407	118.42904	1	0	y	0	210
491												



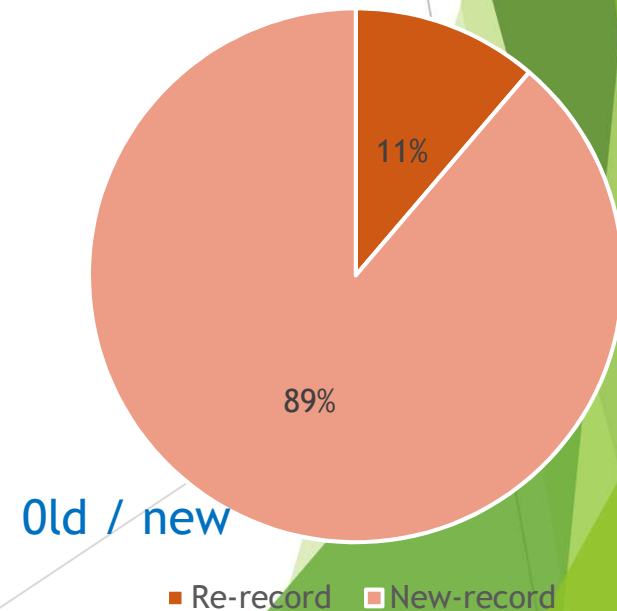
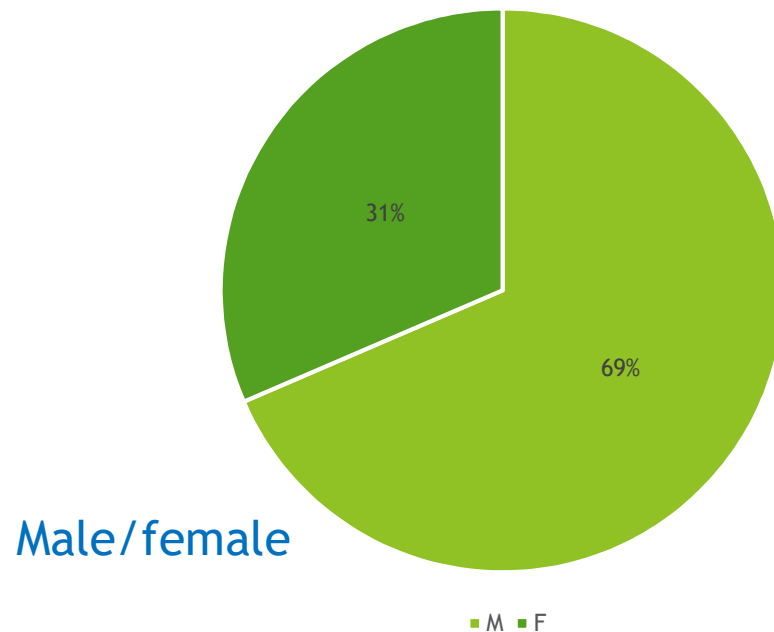
► In 2019, we analyzed 358 spraints and identified 89 individuals (61,28)

Month	samples	DNA extraction	通過篩選數	鑑定成功數	Indiv. no.	New	Successful rates
2	132	132	85	49	27	21	37%
5	101	101	66	30	26	22	30%
9	79	79	54	39	19	15	49%
11	46	46	39	27	24	18	59%



► 2019 identification Info.

- 61 male vs. 28 female
- New faces (79) are eight times more than old faces (10)
- 47 otters (37, 10) disappeared after half a year → runaway otters?

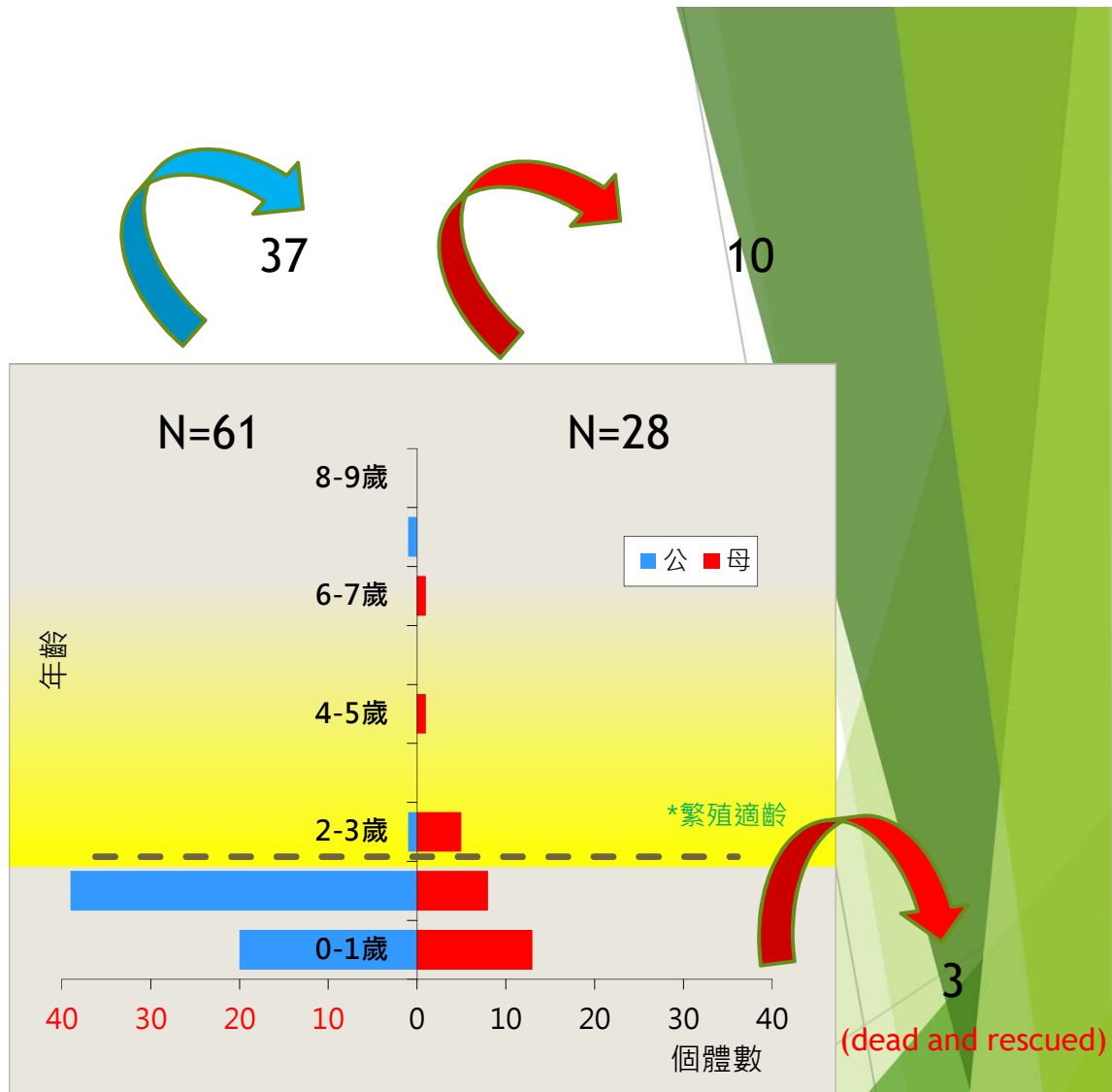


glossary

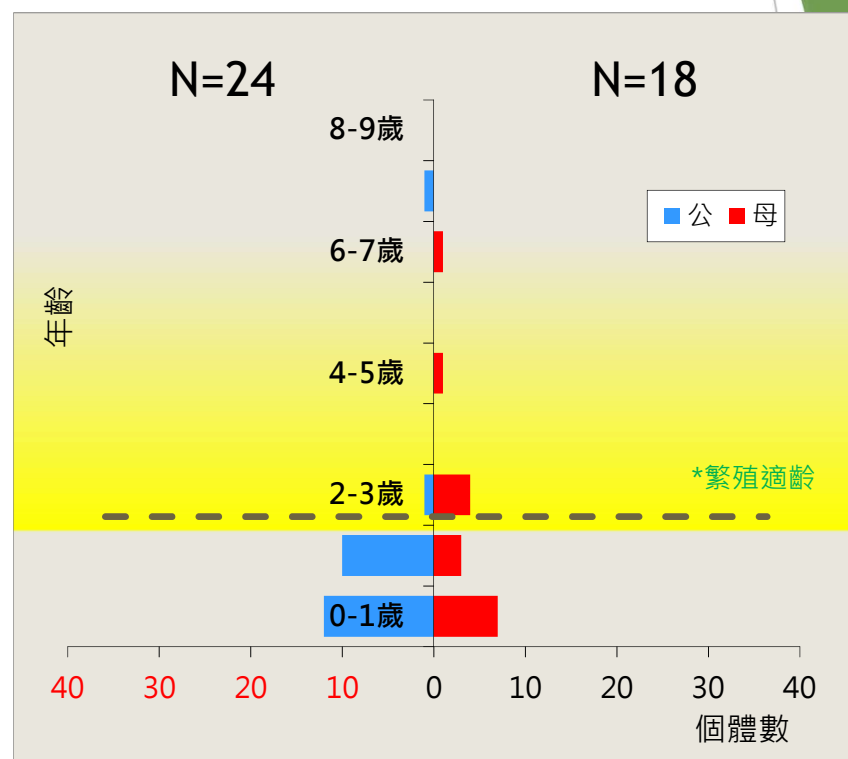
- ▶ **Age estimated:** $(D2-D1)/365+0.5$
- ▶ **Runaway youngs:** indiv. disappeared from the first record after half a year
- ▶ **Settler:** indiv. found after half a year
- ▶ **EPAI:** Estimated population of all recorded individuals of the year
- ▶ **EPSI:** Estimated population of stayed individuals in the end of the year



2019 population structure of Kinmen otter

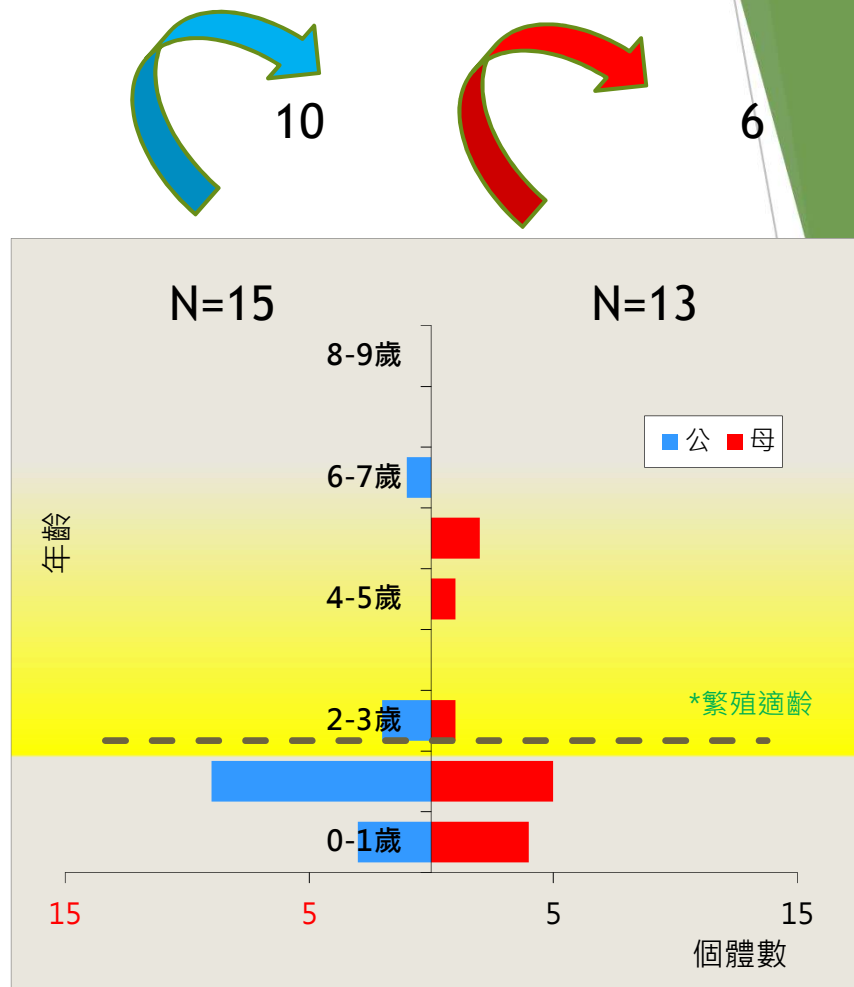


2019 population structure of Kinmen otter



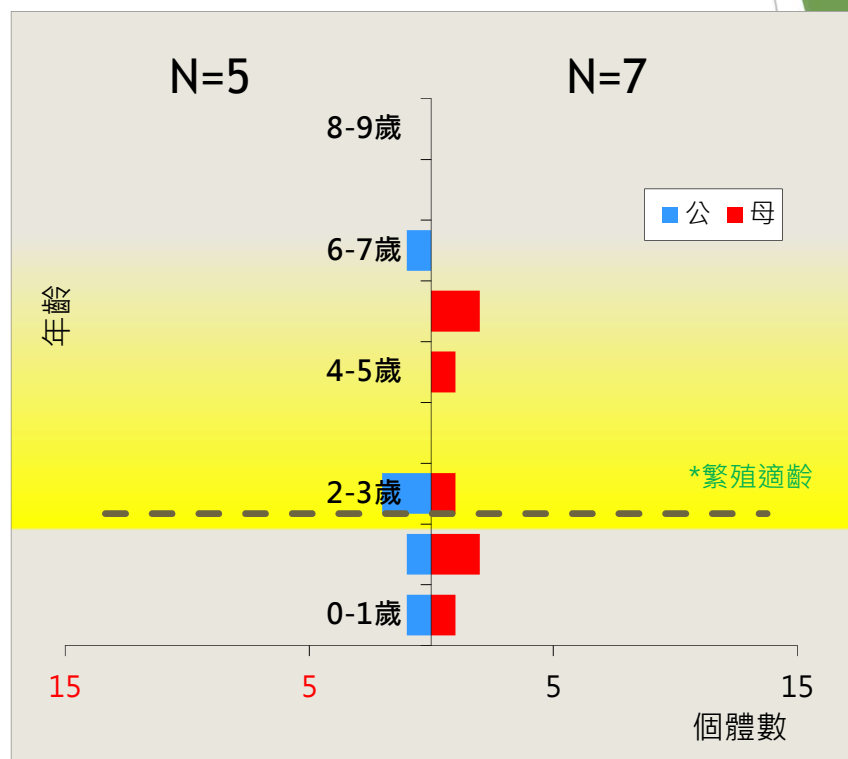
2019 EPSI

2018 population structure of Kinmen otter



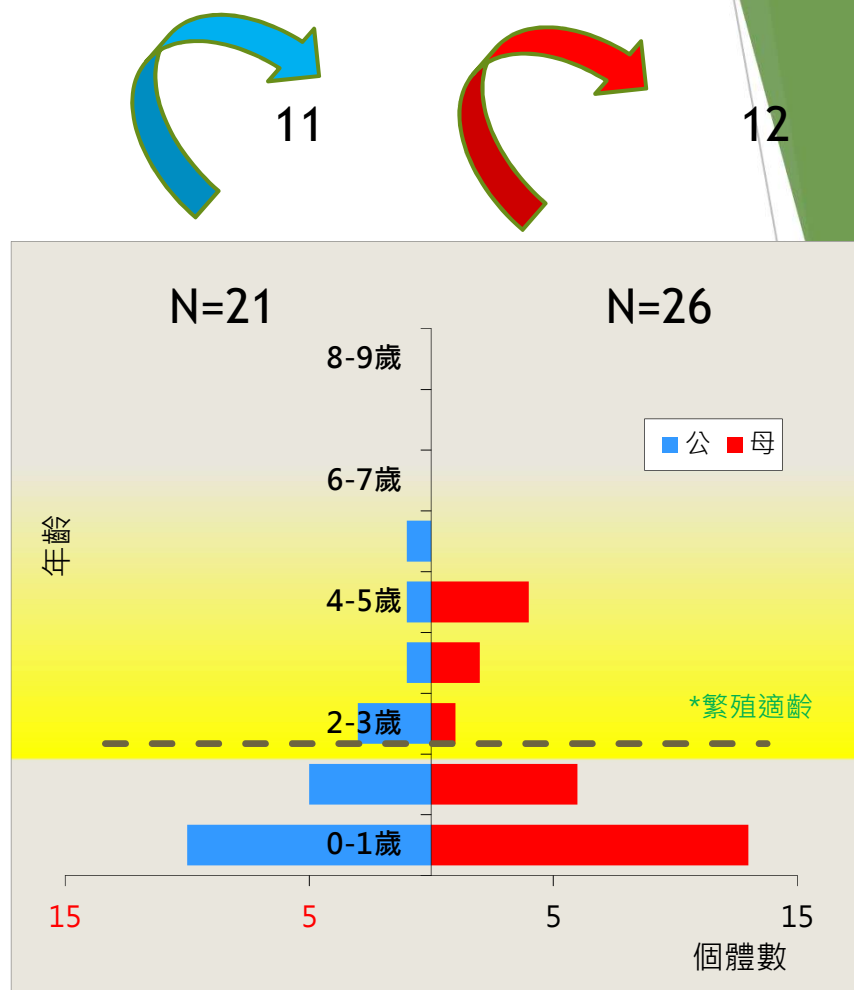
2018 EPAI

2018 population structure of Kinmen otter



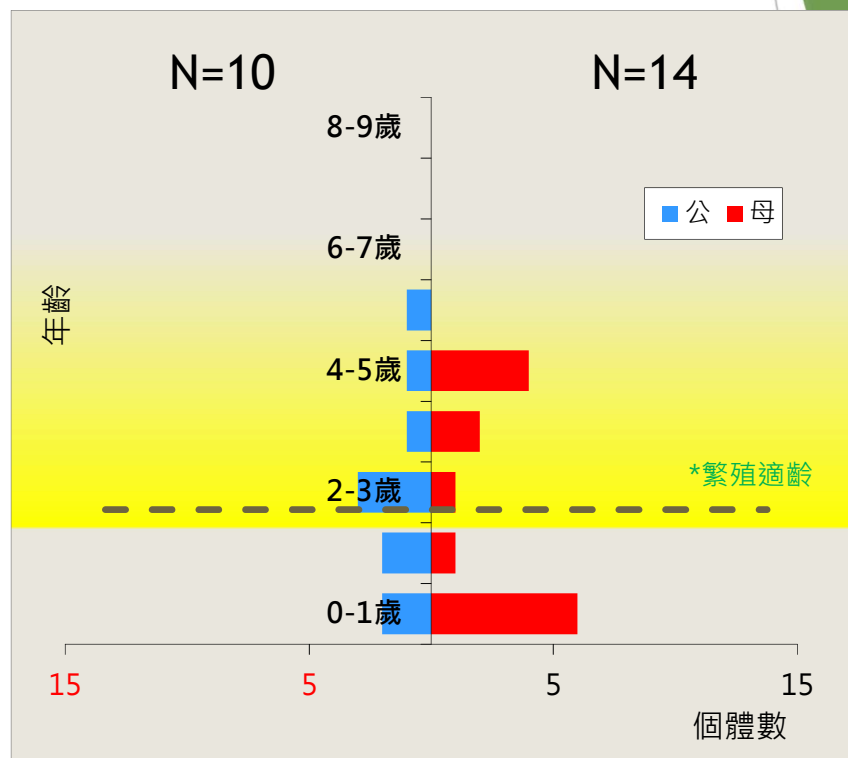
2018 EP51

2017 population structure of Kinmen otter



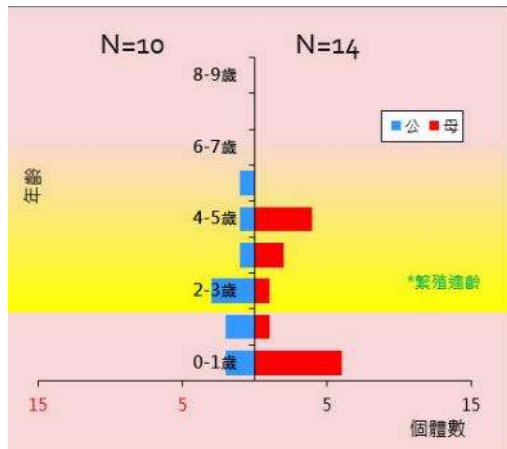
2017 EPAI

2017 population structure of Kinmen otter



2017 EPSI

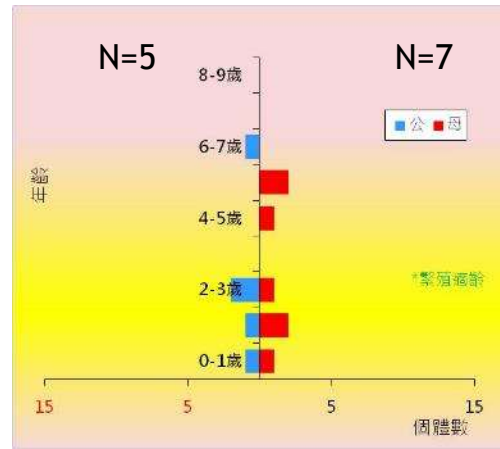
EPAI



11



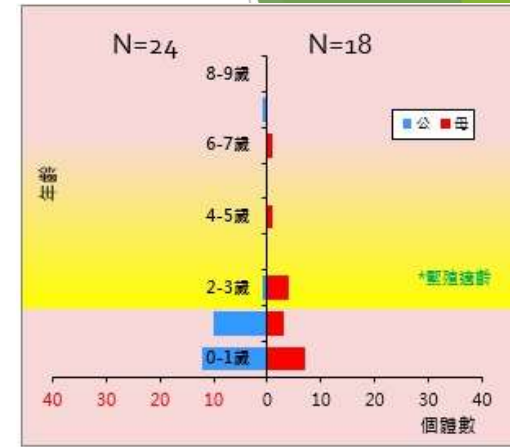
12



10



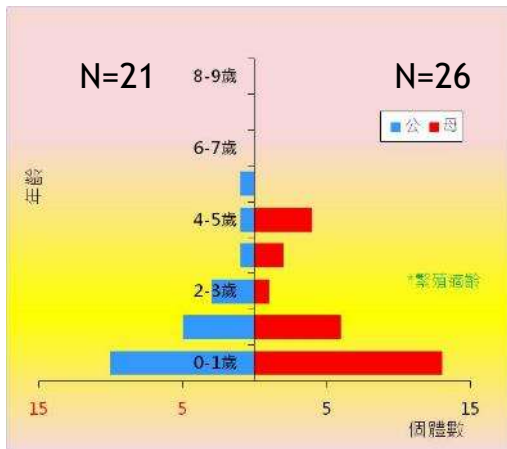
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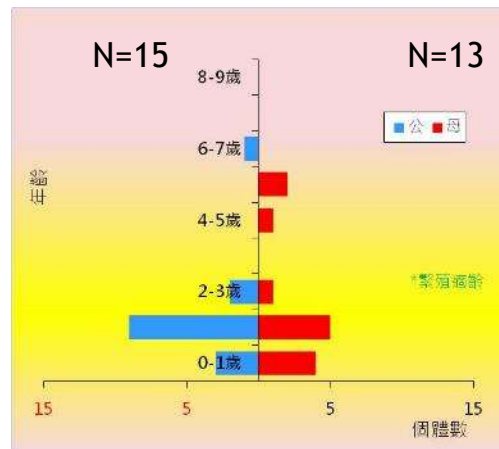
37



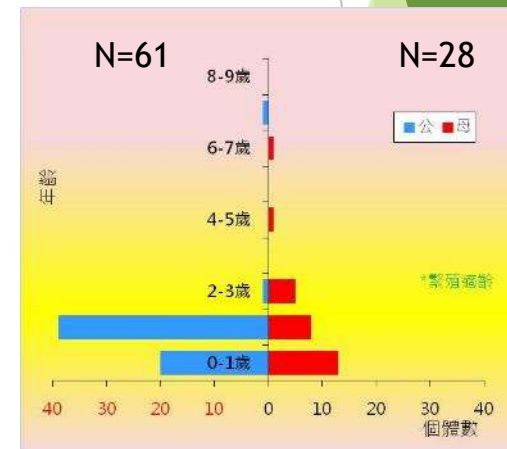
10



2017

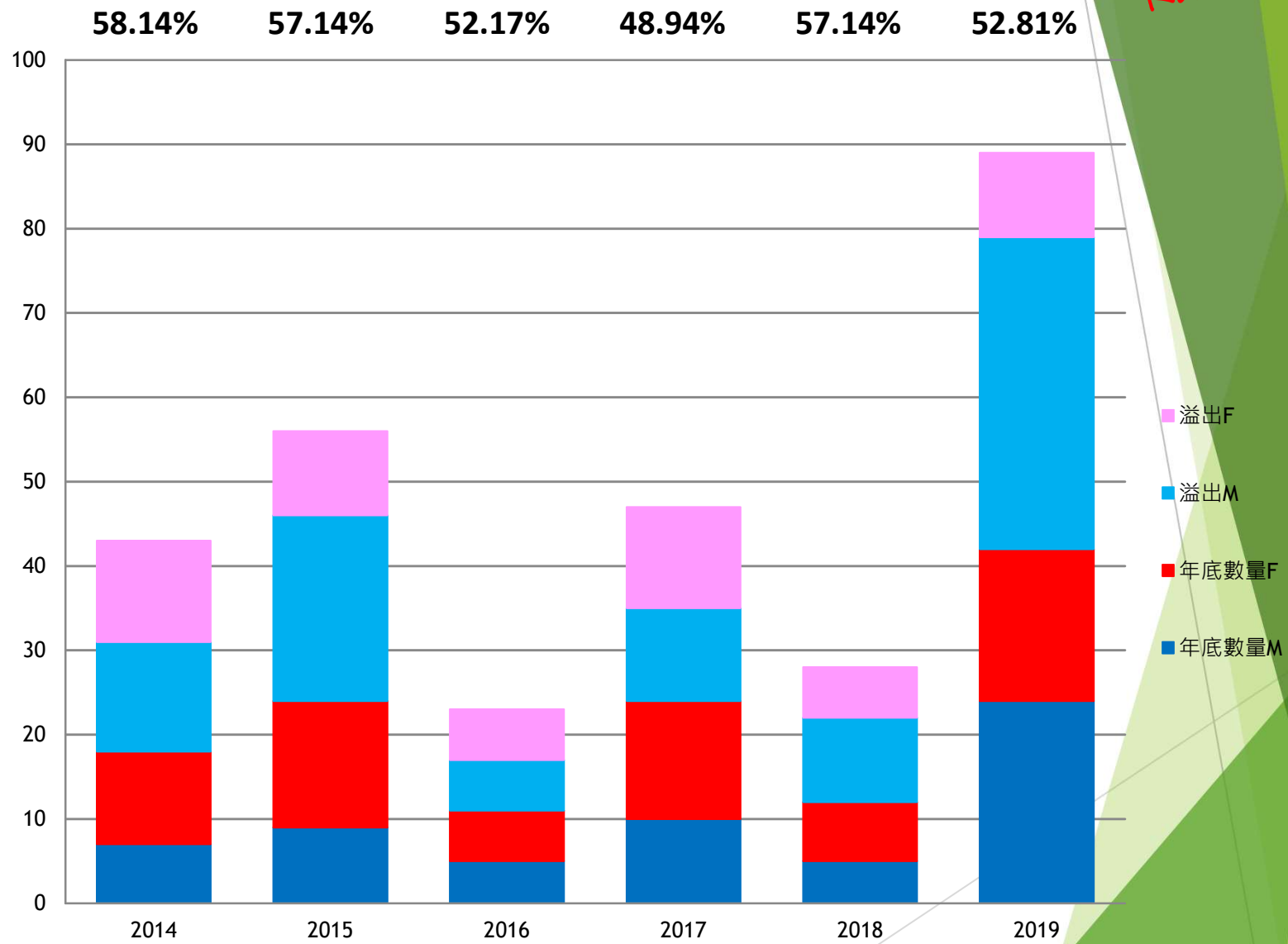


2018



2019

EPSI



Runaway

Conclusions and questions

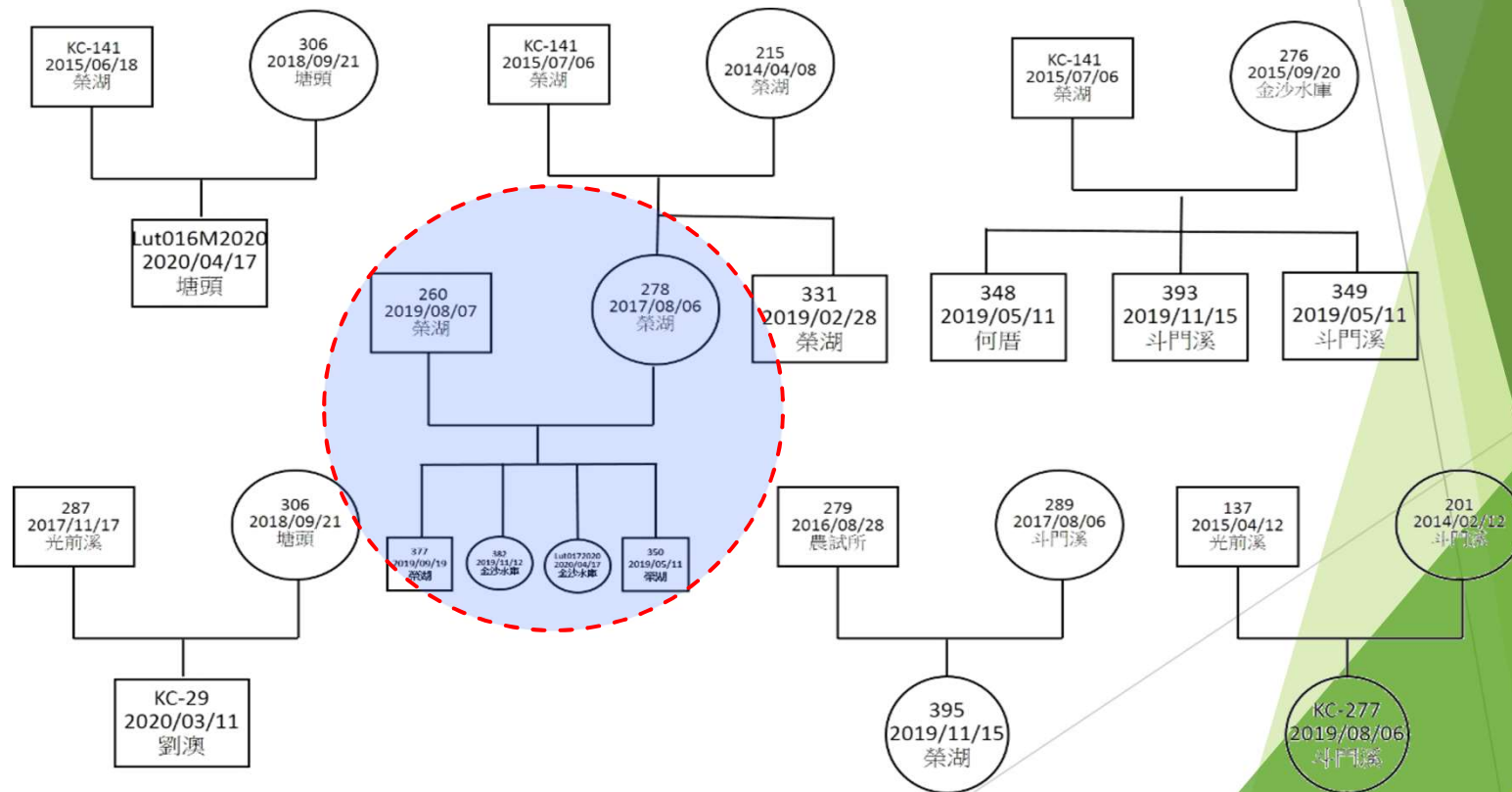
- ▶ Youngers are numbers than aged ones
- ▶ High percentage of new face disappeared
- ▶ Runaway to which place?
- ▶ Any hot spots of breeding?
- ▶ Carrying capacity?



2020年金門水獺譜系建立 (Genealogy)

▶ 金沙水庫-榮湖-斗門溪地區

- ▶ 標定出6個配對家族
- ▶ 重要個體：公獺260 與母獺278；KC-141



Thank you for your attention

