

# Population structure and age-related timing on spring migration of Steppe eagles in Eilat, Israel

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INTERNATIONAL BIRDING &  
RESEARCH CENTER | EILAT






## And community based conservation

Photo: Hadoram Shrihai

# The Status of Steppe Eagle



The IUCN: Steppe Eagle (*Aquila nipalensis*) - endangered.  
"very rapid recent declines across much of its range".

-  changes in land use.
-  power line collisions and electrocutions.
-  stealing of young eagles from nests.

# IUCN Steppe Eagle distribution map

## Interest in wintering sites and migration routes

(Transmitters data, Dau Lal's work in India)

Aquila nipalensis (Steppe Eagle) distribution map showing the range across Eurasia and North Africa. The map highlights the breeding range (dark yellow) and the wintering range (light yellow). Blue arrows indicate migration routes from the breeding range southwards to the wintering range. A yellow star marks a specific location in North Africa. A blue question mark is also present in the wintering range.

THE IUCN RED LIST OF THREATENED SPECIES

Scientific or Common name [GO](#)

HOME SPECIES RANGE OBSERVATION PROTECTED AREAS

CHANGE BASEMAP

Image Unavailable

Aves > Accipitriformes > Accipitridae  
**Aquila nipalensis**  
Steppe Eagle  
[Download Spatial data](#)

[Back to Red List Page](#)

NE DD LC NT VU **EN** CR EW EX  
ENDANGERED

- Extant (breeding)
- Extant (non breeding)
- Extant (passage)

BROWSE IMAGES

[ARKive \(0 found\)](#)

BirdLife International and Handbook of the Birds of the World (2017) 2017. *Aquila nipalensis*. The IUCN Red List of Threatened Earthstar Geographics | IUCN

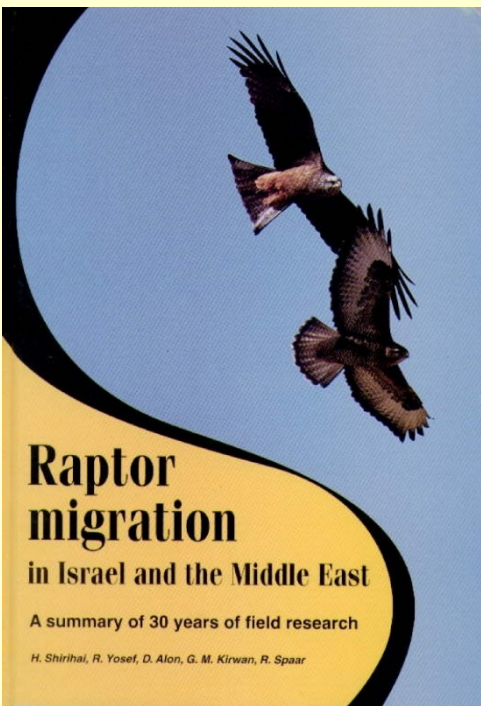
IUCN SSC Species Survival Commission

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# 5,000 – 6,000 Steppe Eagles at Ushaiqer rubbish dump, Saudi Arabia (November and Winter) – 65% adults

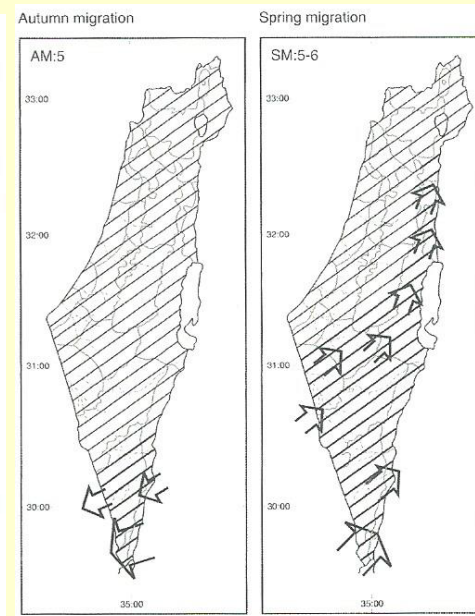
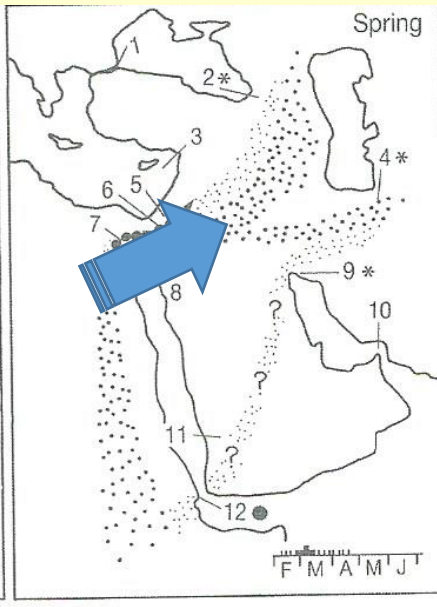
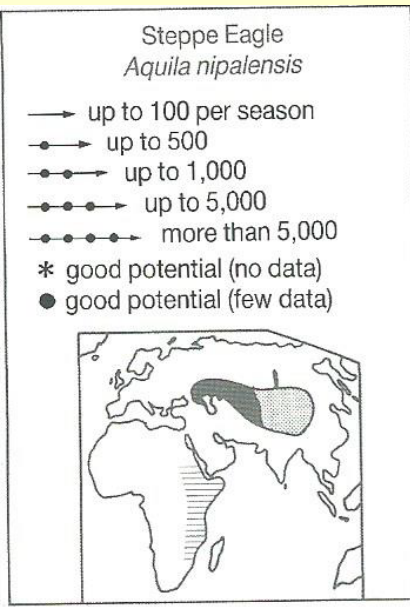
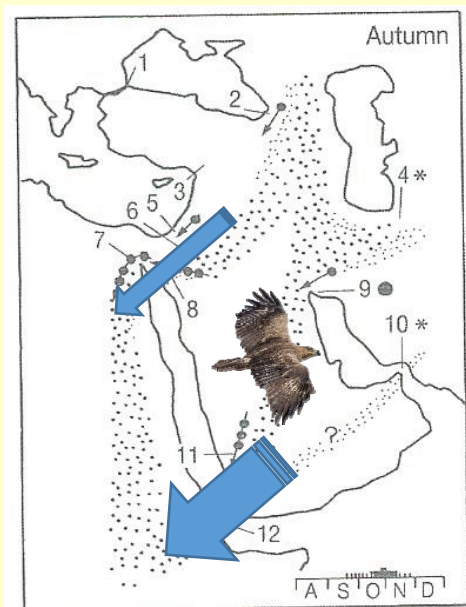
- Following McGrady's transmitters locations.
- Not such good news for Eagle's conservation.





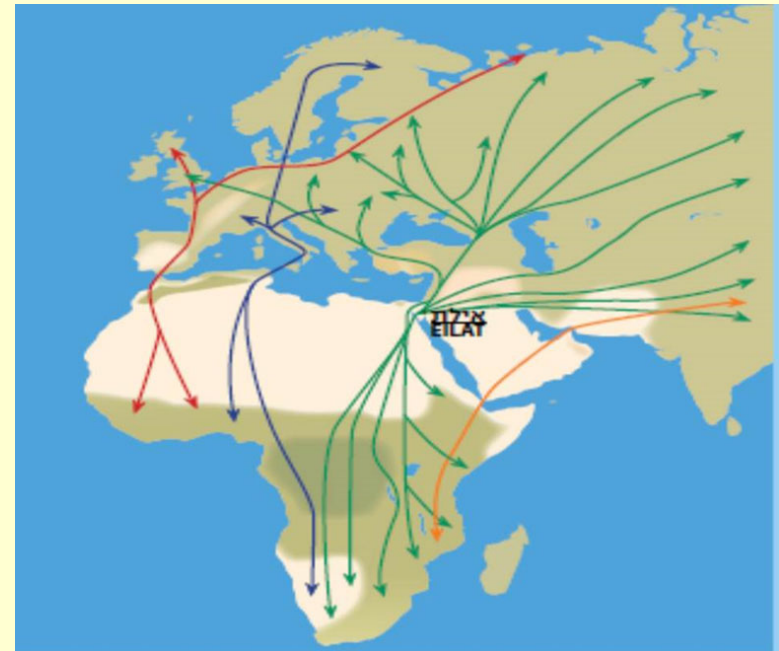
# Steppe Eagle's flyways in the Middle East

## Partial Loop Migration

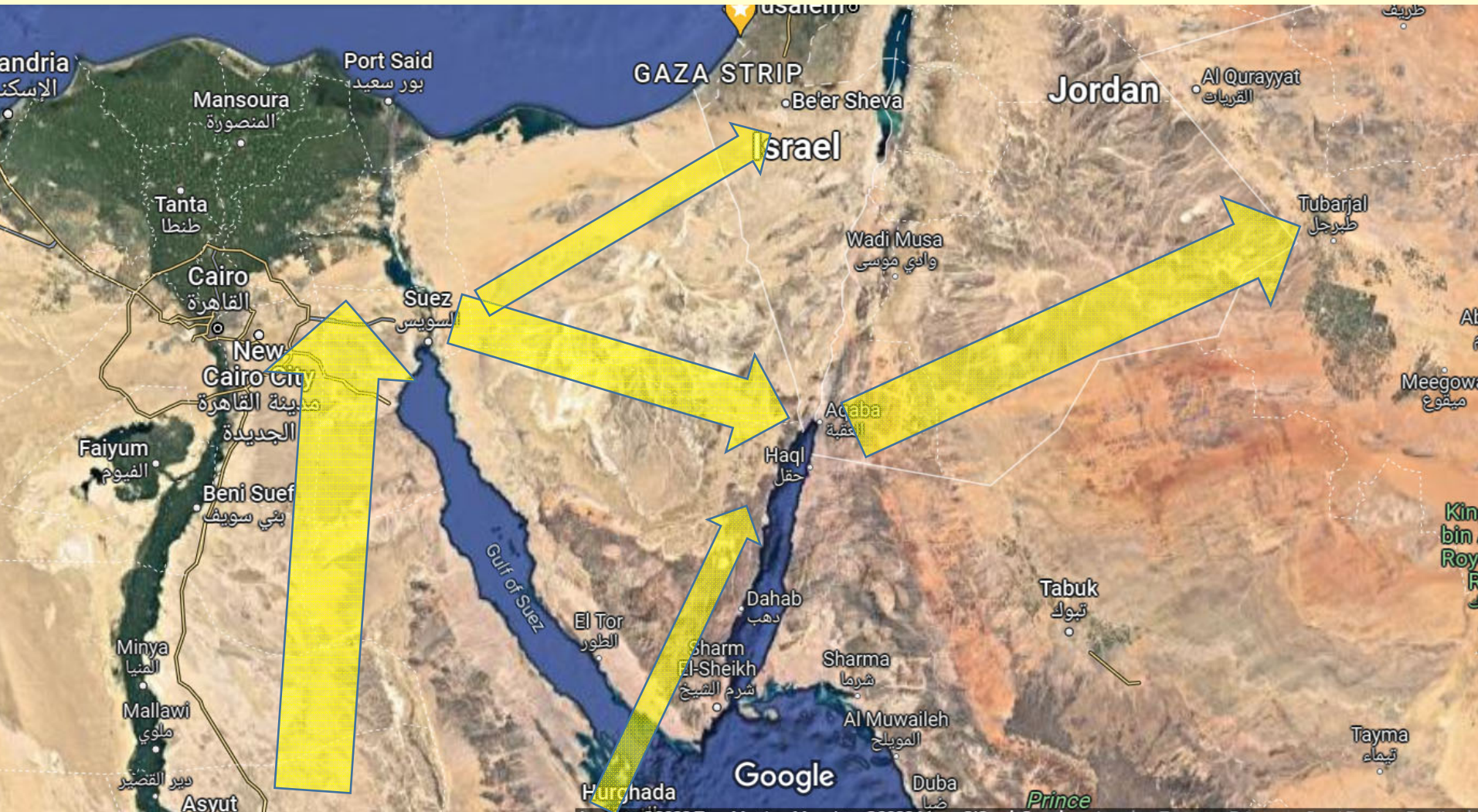


# Eilat's bottle neck – Responsibility and Opportunity

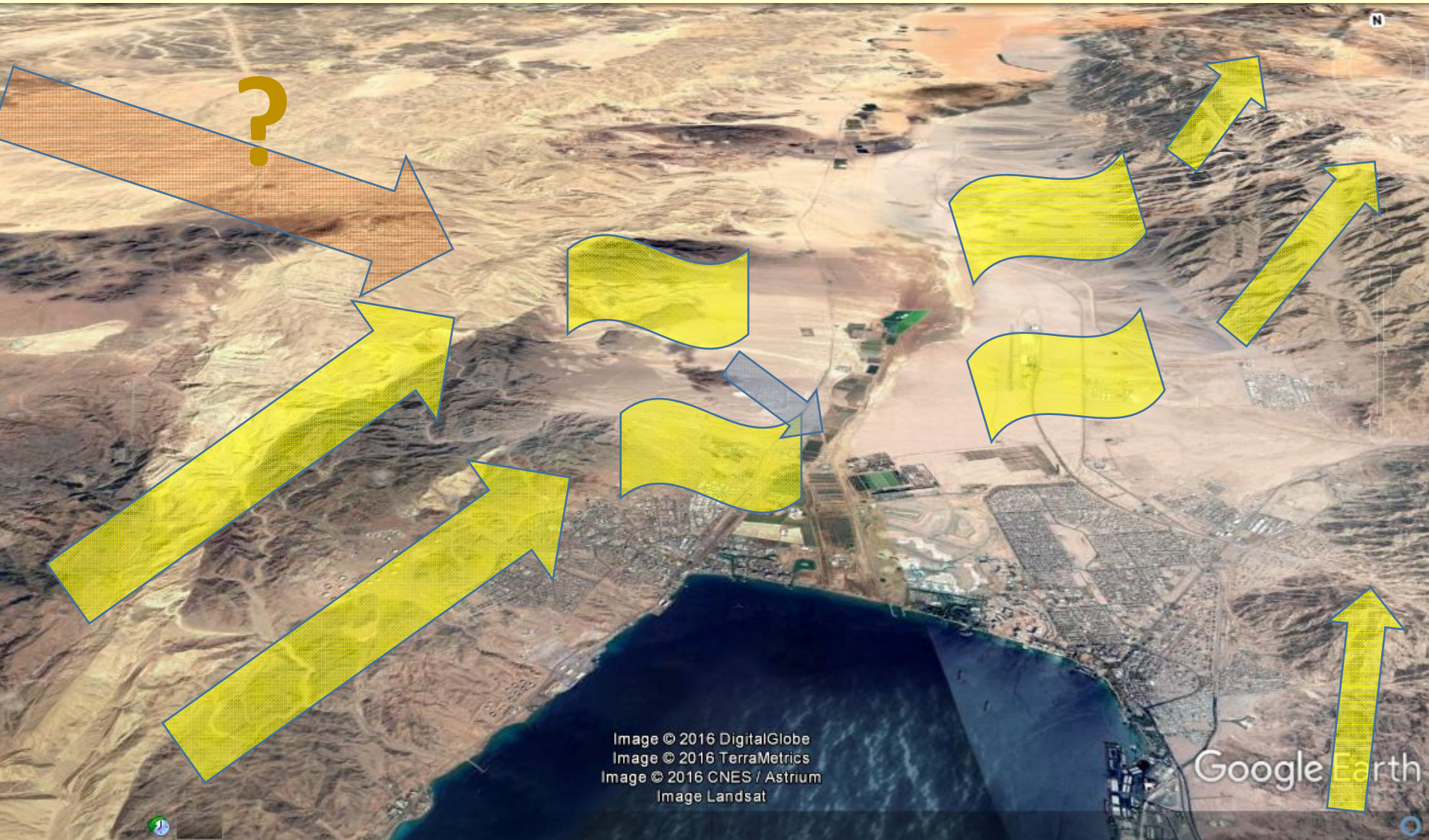
- Eilat is situated on one of the busiest migration bottlenecks in the world at the northern end of the Sahara desert.
- We Have both the opportunity and responsibility to monitor this migration for global conservation use.
- And for local protection of our stretch of the flyway.



# Steppe Eagles routes – lit. + transmitters



# Eilat's Raptors bottleneck





# Diverse migration routes

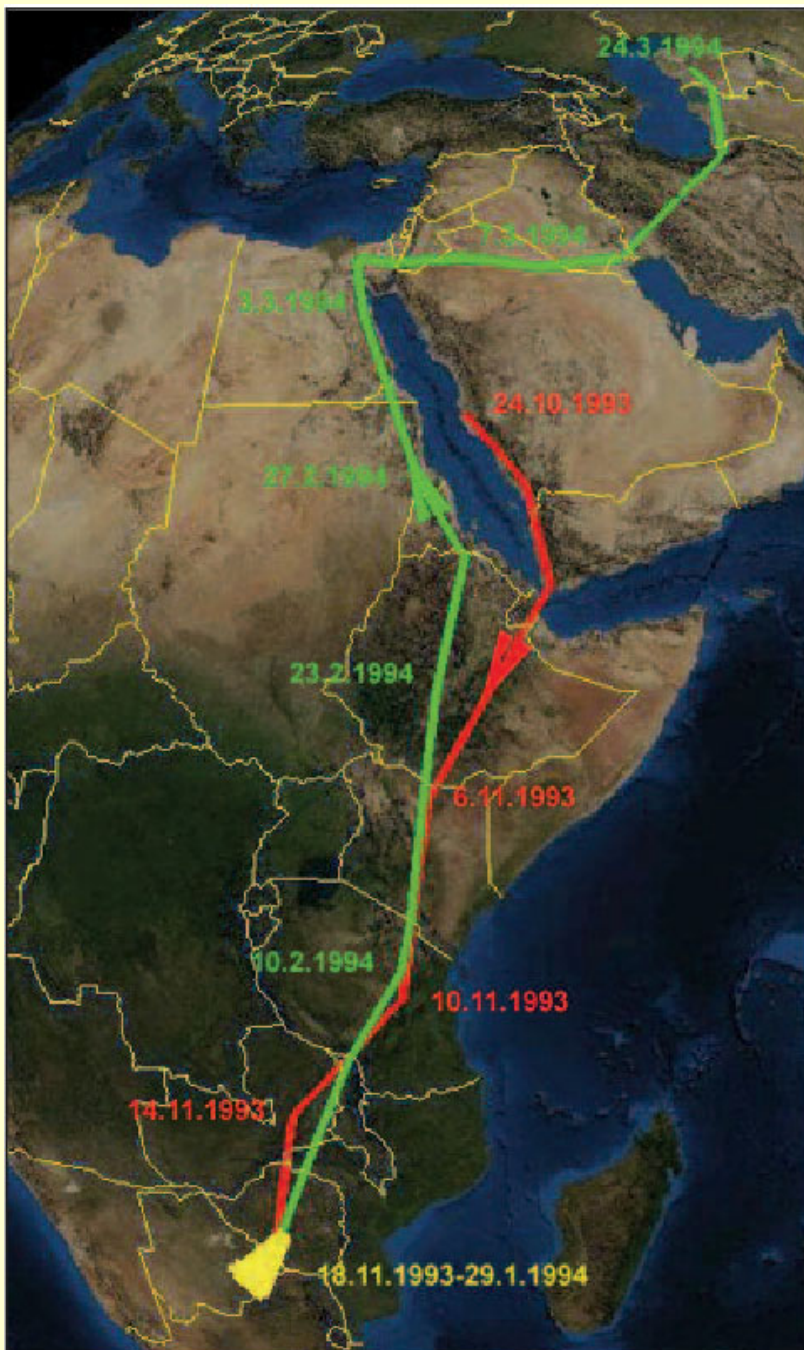


Fig. 1. Eagle F5 (Note: In figs 1–5 red lines

## The survey:

- 2 count stations, 2 observers in each, 5 KM apart, sunrise to sunset.
- Double count by phone in real time.
- run by a protocol identical to similar count stations in Europe.
- Protocol as close as possible to what we know was in Eilat in the past.
- Data collection by Trektellen.



**IBRCE**

International Birding & Research  
Center, Eilat, Israel

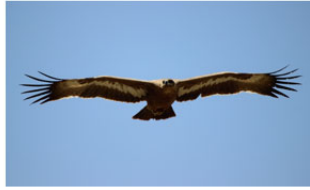
**SPNI**

Society for the Protection of  
Nature in Israel



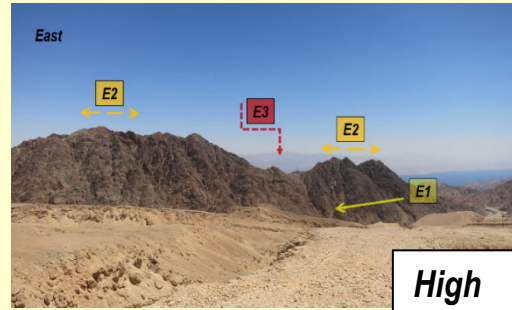
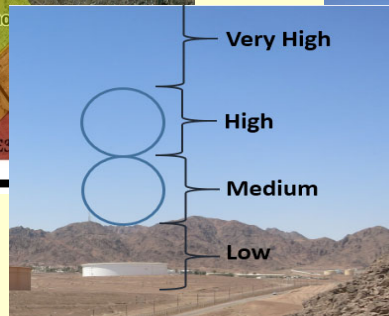
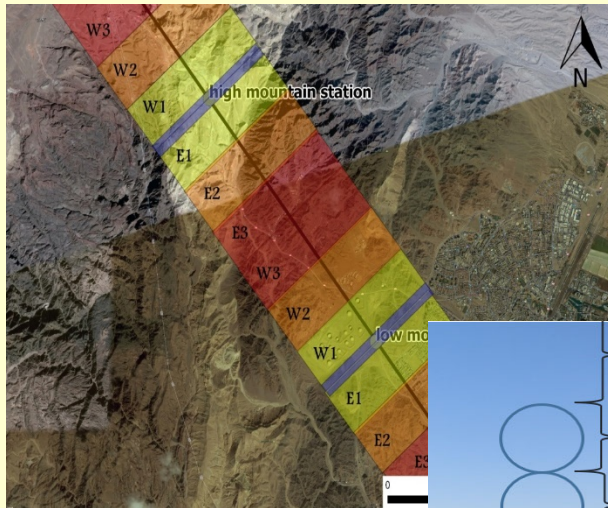
Society for the  
Protection of Nature in Israel  
מחנה להגנת הטבע  
Israel Ornithological Center

*Eilat spring raptor migration monitoring protocol  
High Mountain & Low Mountain (Eilat – Israel)*

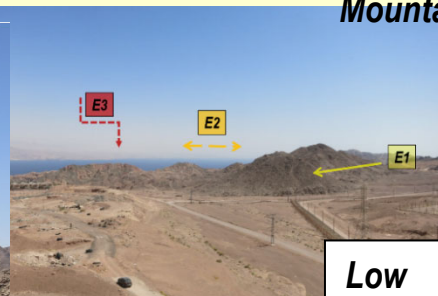


Redaction: M.Ruiz, C.Robinet, N.Weiss

Eilat raptor migration monitoring protocol v. 04.2017



**High Mountain**



**Low Mountain**



# Data collection

Excel - 2018 דורסים אילת

noamw@spni.org.il

תצוגה סקירה נתונים נוסחאות פריסת עמוד הוספה בית קובץ

פנקודות מאקרו החלף חלונות הצג זה לצד זה גלילה סינכרונית אפס מיקום חלון פצל הסתר הקפא סדר חלון חדש חלון ביטול הסתרה חלון שנה גודל 100% שנה גודל תצוגה לפי הקטע הנבחר שניי גודל תצוגה שורת הנוסחאות סרגל כותרות קווי רשת תצוגות של מעברי עמוד מותאמת אישית תצוגות חוברת עבודה

R477

Sex	Age	Height	From	local	count	אנגלית	עברית	longitude	latitude	StationEn	StationHe	TimeFrom	Date	סגירה	פתיחה	צופה	1
J	M	E1		0	0	2	Steppe Ea	34.88673	29.58296	High Mour	ההר הגבוה	9:38	15/02/2018	16:00	7:30	Gaidis Gra	455
A	M	E1		0	0	17	Steppe Ea	34.88673	29.58296	High Mour	ההר הגבוה	9:46	15/02/2018	16:00	7:30	Gaidis Gra	456
	M	E1		0	0	1	Steppe Bu	34.88673	29.58296	High Mour	ההר הגבוה	9:47	15/02/2018	16:00	7:30	Gaidis Gra	457
A	M	E2		0	0	2	Steppe Ea	34.88673	29.58296	High Mour	ההר הגבוה	10:00	15/02/2018	16:00	7:30	Gaidis Gra	458
A	L	E2		0	0	4	Steppe Ea	34.88673	29.58296	High Mour	ההר הגבוה	10:01	15/02/2018	16:00	7:30	Gaidis Gra	459
A	M	E2		0	0	9	Steppe Ea	34.88673	29.58296	High Mour	ההר הגבוה	10:04	15/02/2018	16:00	7:30	Gaidis Gra	460
A	L	E2		0	0	4	Steppe Ea	34.88673	29.58296	High Mour	ההר הגבוה	10:08	15/02/2018	16:00	7:30	Gaidis Gra	461
A	M	E2		0	0	2	Steppe Ea	34.88673	29.58296	High Mour	ההר הגבוה	10:08	15/02/2018	16:00	7:30	Gaidis Gra	462
A	M	E2		0	0	25	Steppe Ea	34.88673	29.58296	High Mour	ההר הגבוה	11:04	15/02/2018	16:00	7:30	Gaidis Gra	463
	L	E2		0	0	5	Black Stonor	34.88673	29.58296	High Mour	ההר הגבוה	11:49	15/02/2018	16:00	7:30	Gaidis Gra	464
A	M	E2		0	0	12	Steppe Ea	34.88673	29.58296	High Mour	ההר הגבוה	12:08	15/02/2018	16:00	7:30	Gaidis Gra	465
A	L	E1		0	0	4	Steppe Ea	34.88673	29.58296	High Mour	ההר הגבוה	12:17	15/02/2018	16:00	7:30	Gaidis Gra	466
A	M	E2		0	0	12	Steppe Ea	34.88673	29.58296	High Mour	ההר הגבוה	12:23	15/02/2018	16:00	7:30	Gaidis Gra	467
A	M	E1		0	0	1	Steppe Bu	34.88673	29.58296	High Mour	ההר הגבוה	12:23	15/02/2018	16:00	7:30	Gaidis Gra	468
A	L	E1		0	0	1	Steppe Bu	34.88673	29.58296	High Mour	ההר הגבוה	12:34	15/02/2018	16:00	7:30	Gaidis Gra	469
A	M	E1		0	0	9	Steppe Ea	34.88673	29.58296	High Mour	ההר הגבוה	13:17	15/02/2018	16:00	7:30	Gaidis Gra	470
A	M	E1		0	0	2	Steppe Ea	34.88673	29.58296	High Mour	ההר הגבוה	13:34	15/02/2018	16:00	7:30	Gaidis Gra	471
	M	E1		0	0	5	Black Stonor	34.88673	29.58296	High Mour	ההר הגבוה	14:57	15/02/2018	16:00	7:30	Gaidis Gra	472
A	M	E1		0	0	20	Steppe Ea	34.88673	29.58296	High Mour	ההר הגבוה	14:57	15/02/2018	16:00	7:30	Gaidis Gra	473
	H	E1		0	0	3	Steppe Bu	34.88673	29.58296	High Mour	ההר הגבוה	14:57	15/02/2018	16:00	7:30	Gaidis Gra	474
A	L	E1		0	0	10	Steppe Ea	34.88673	29.58296	High Mour	ההר הגבוה	15:28	15/02/2018	16:00	7:30	Gaidis Gra	475
	H	E1		0	0	1	Steppe Bu	34.88673	29.58296	High Mour	ההר הגבוה	15:40	15/02/2018	16:00	7:30	Gaidis Gra	476
A	H	E1		0	0	26	Steppe Ea	34.88673	29.58296	High Mour	ההר הגבוה	15:40	15/02/2018	16:00	7:30	Gaidis Gra	477

100%

גיליון 3 גיליון 2

17:41 03/09/2018

It can get quite busy

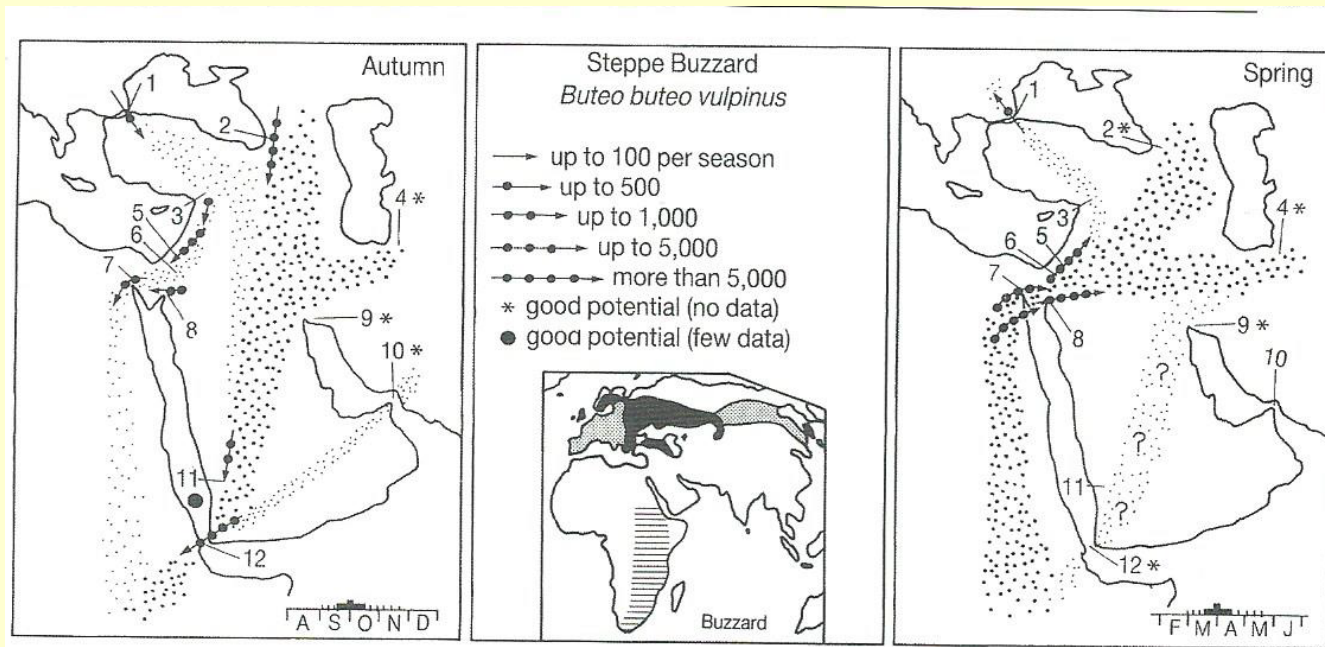
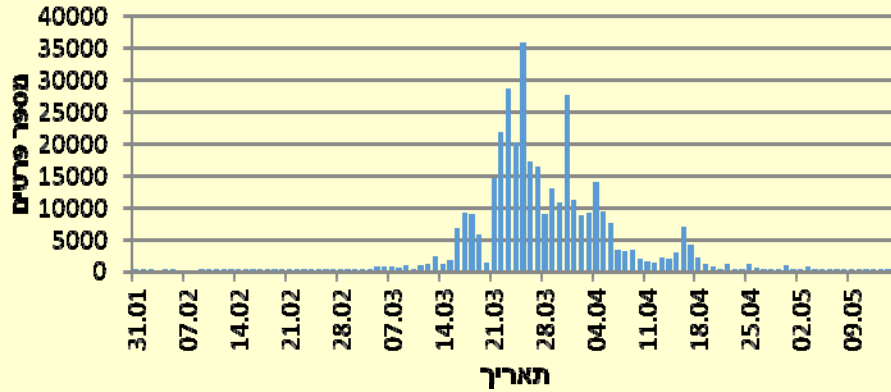


# 500,000 Steppe Buzzards



# Steppe Buzzard

## Steppe Buzzard Daily average 2015 - 2017



# 600,000 Honey Buzzards





# 60,000 Levant Sparrowhawks (Most of the world's population)





16,000 Steppe Eagles  
(Globally endangered)



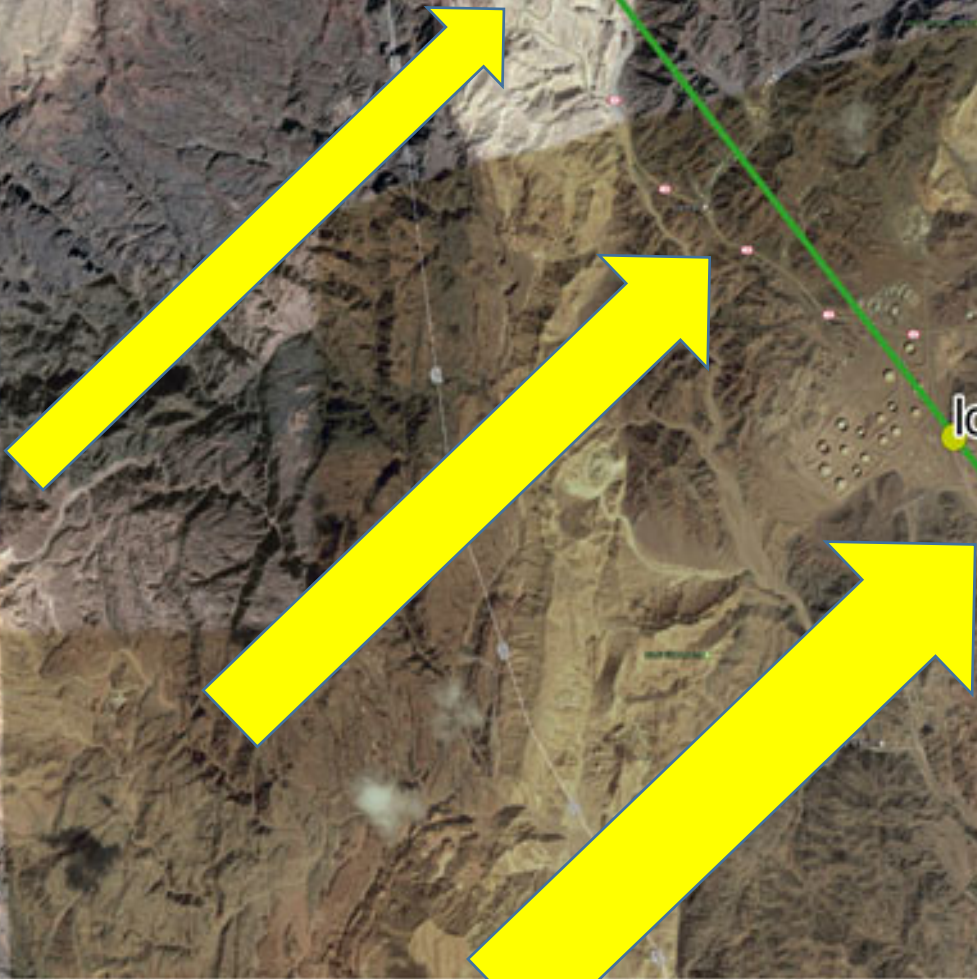
2015 – 2018

2024 - 2027



high mountain station

low mountain station

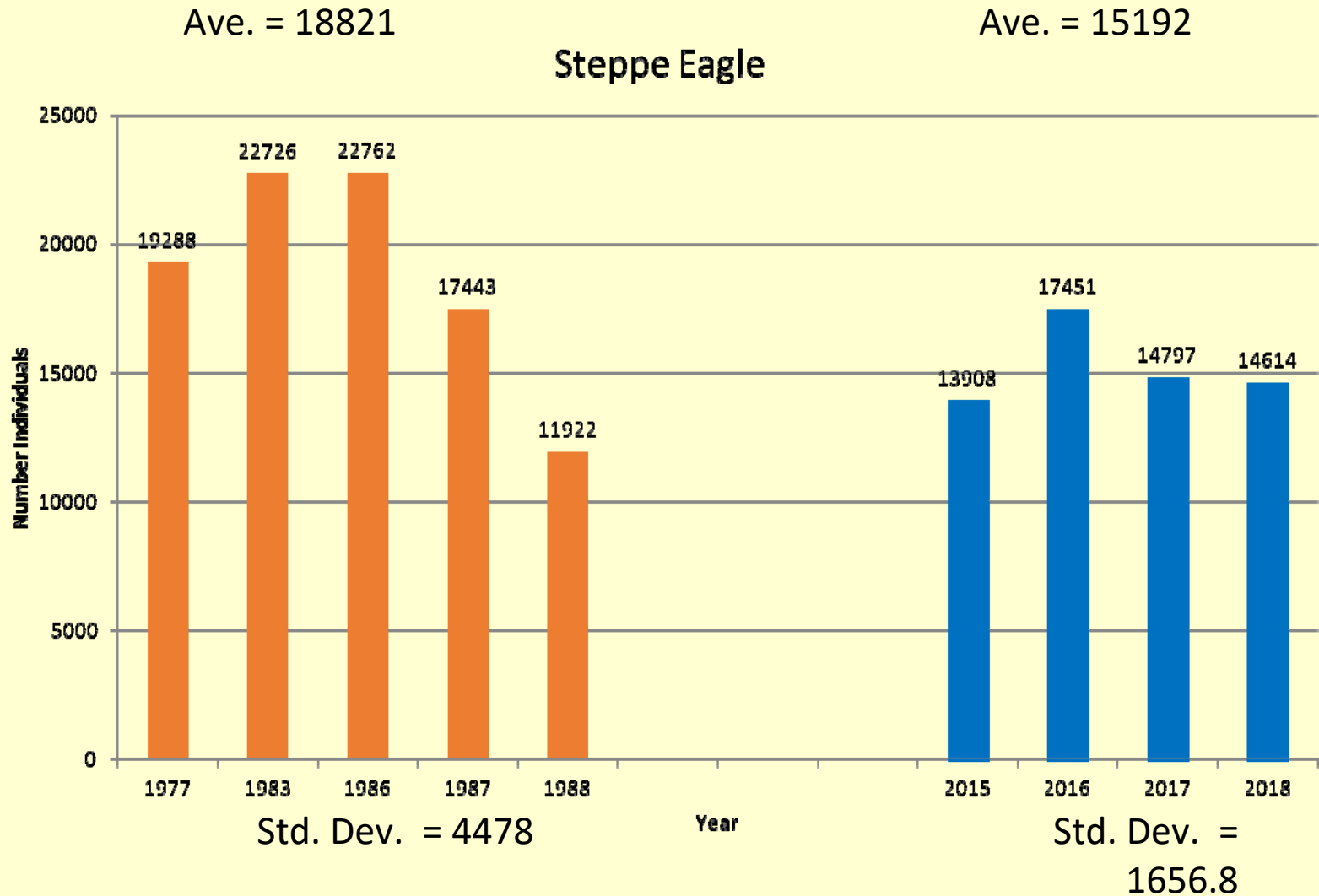


● station  
— transect

0 1 2 3 4 km



# Steppe Eagle – comparable methods

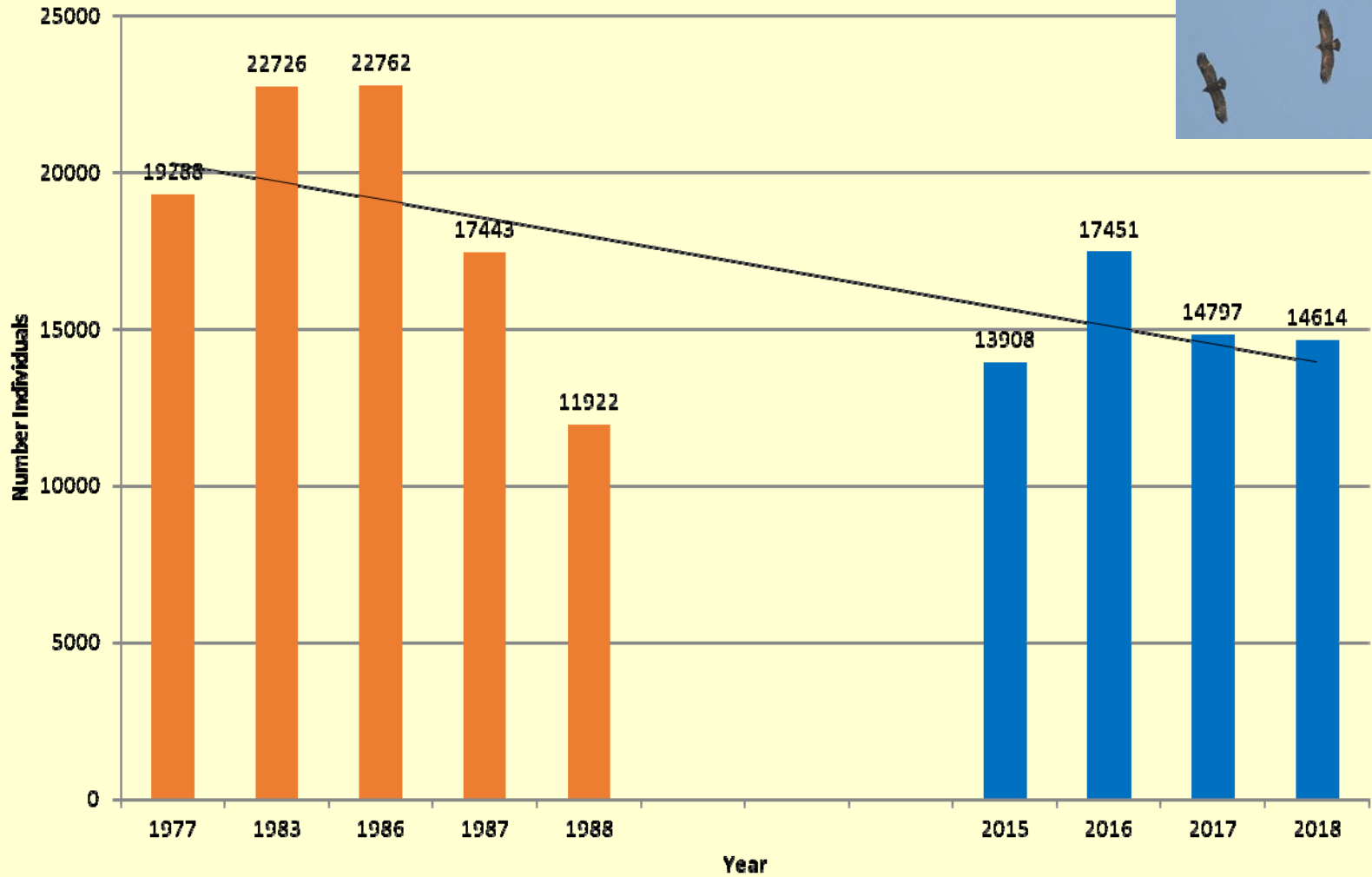


# Steppe Eagle's trend ??

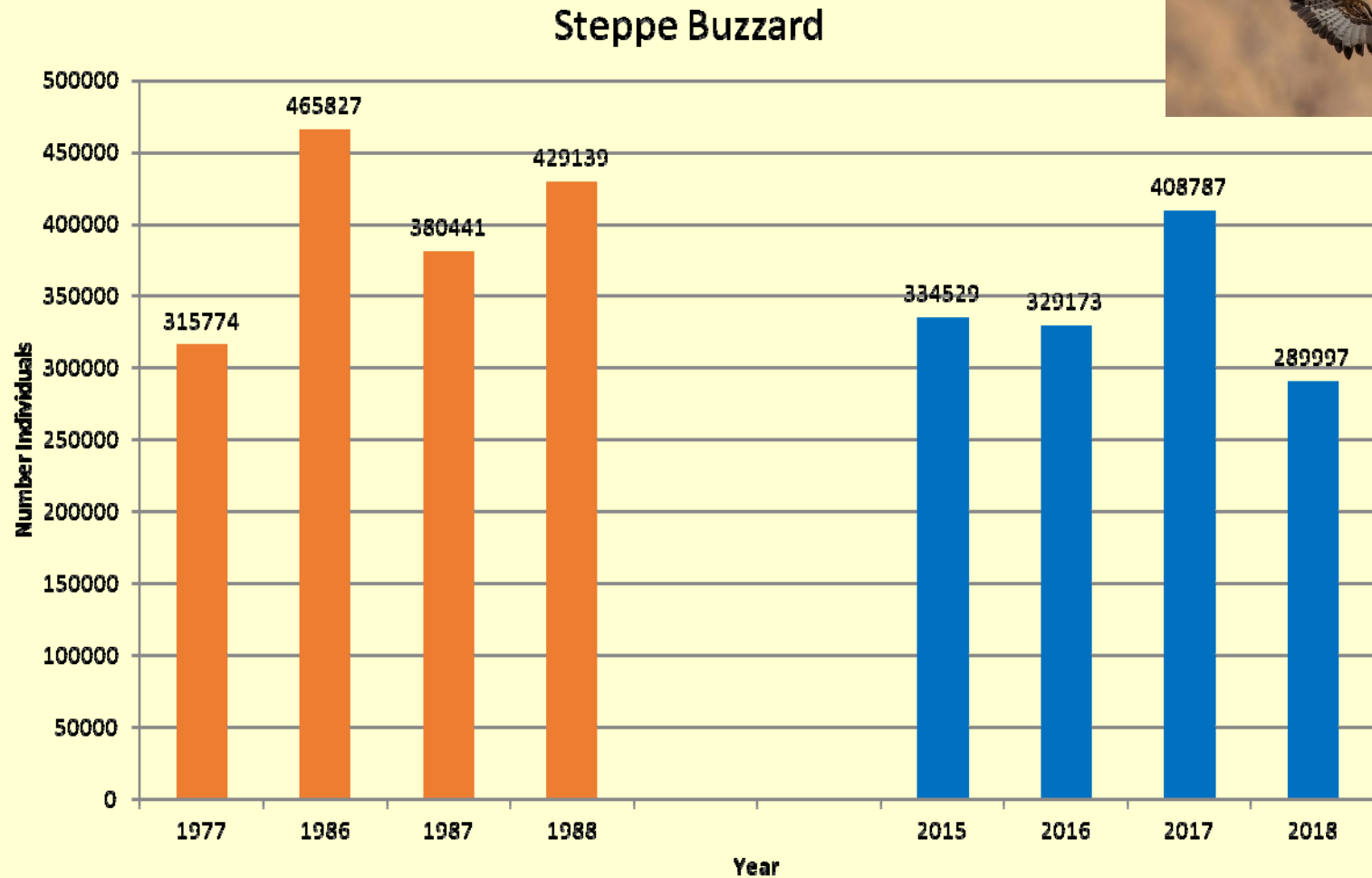
20% decline in 30 years



Steppe Eagle

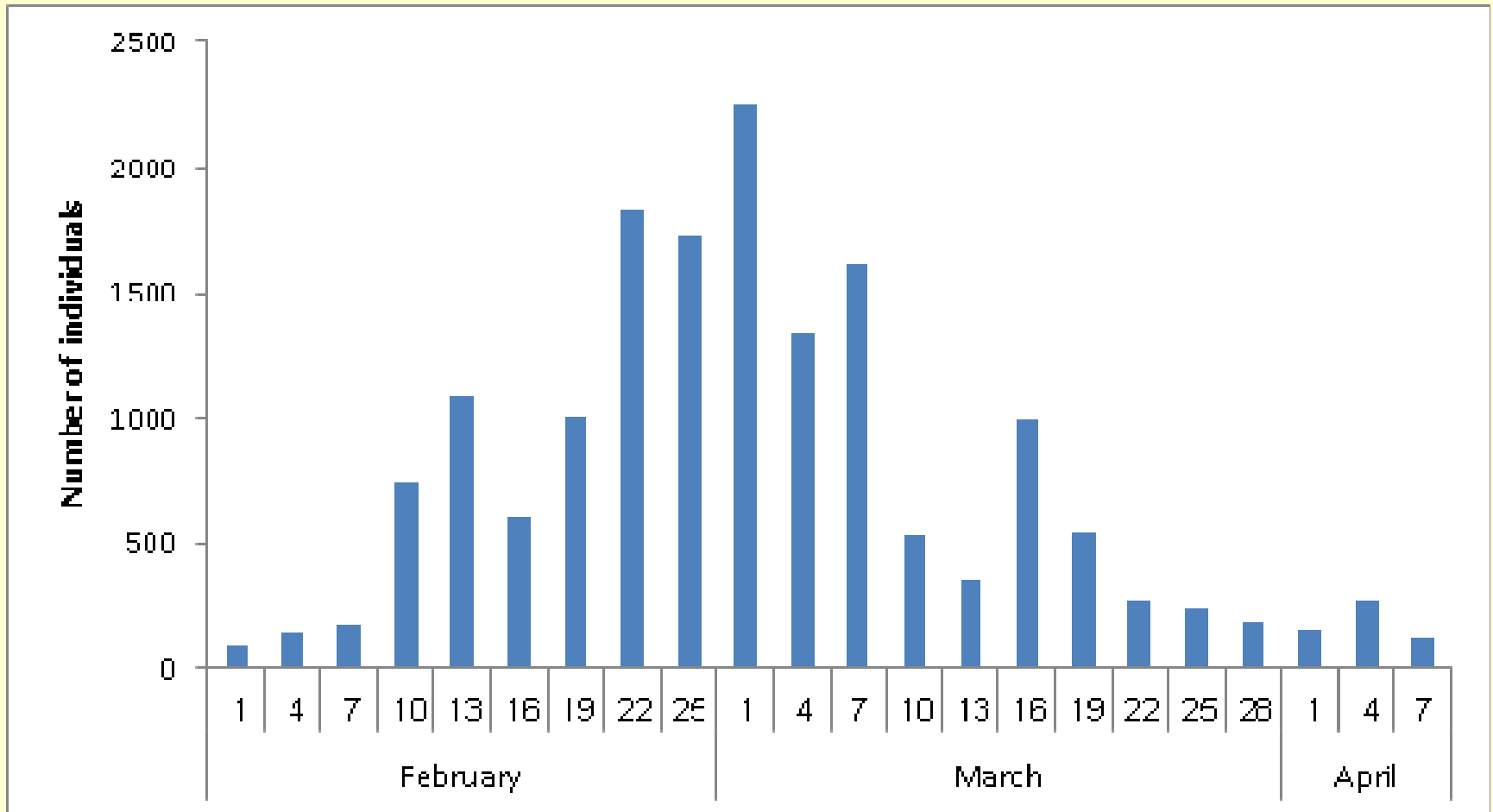


# Steppe Buzzard's trend



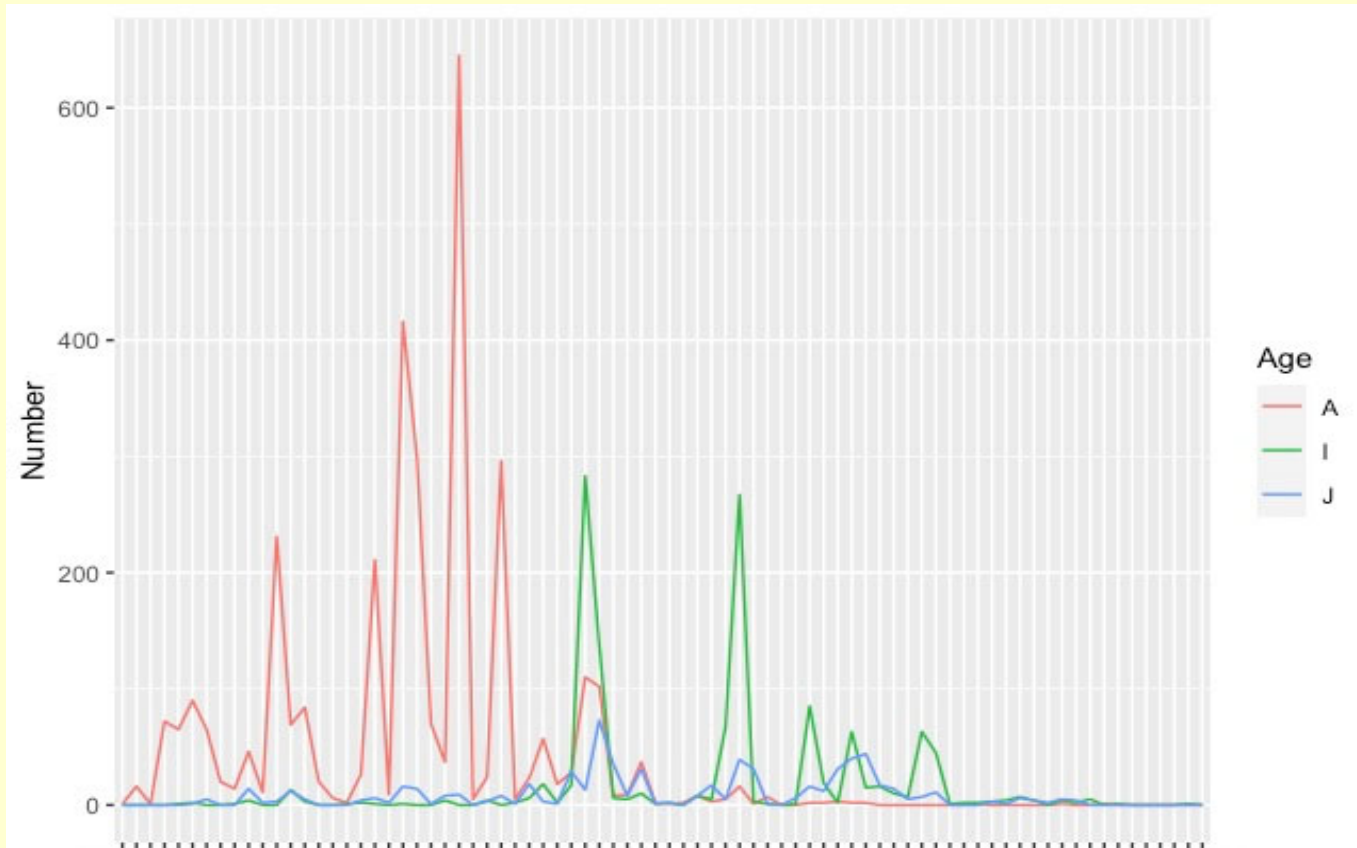
# Timing of Steppe Eagle's migration

(2015-2018)



- 95% passed between the 10<sup>th</sup> of February and the 31<sup>st</sup> of March.
- 50% passed between the 23<sup>rd</sup> of February and the 6<sup>th</sup> of March.
- 33% between the 1<sup>st</sup> and 7<sup>th</sup> of March.

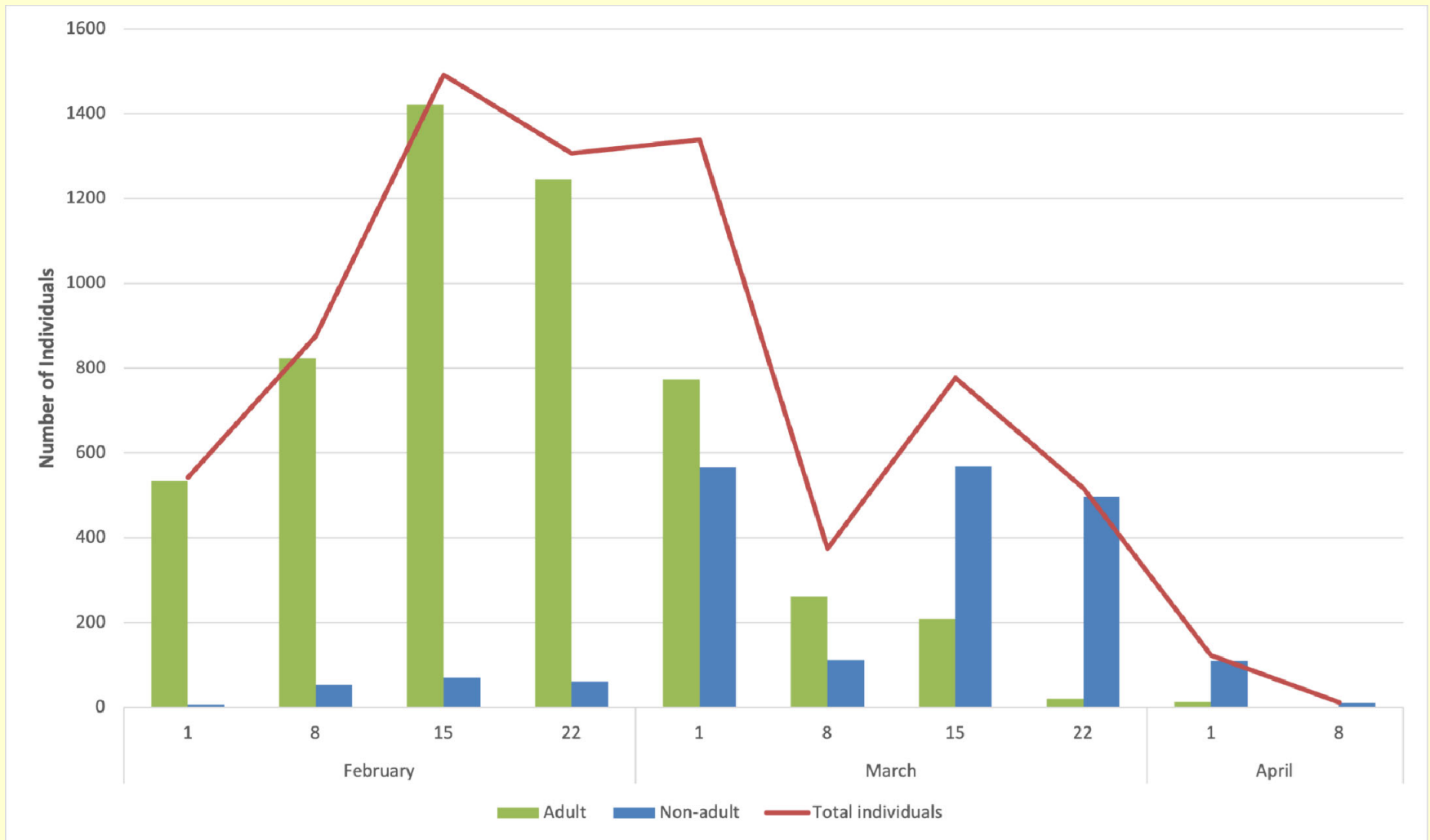
# Age of Steppe Eagles and timing of migration in Eilat – Daily 2017



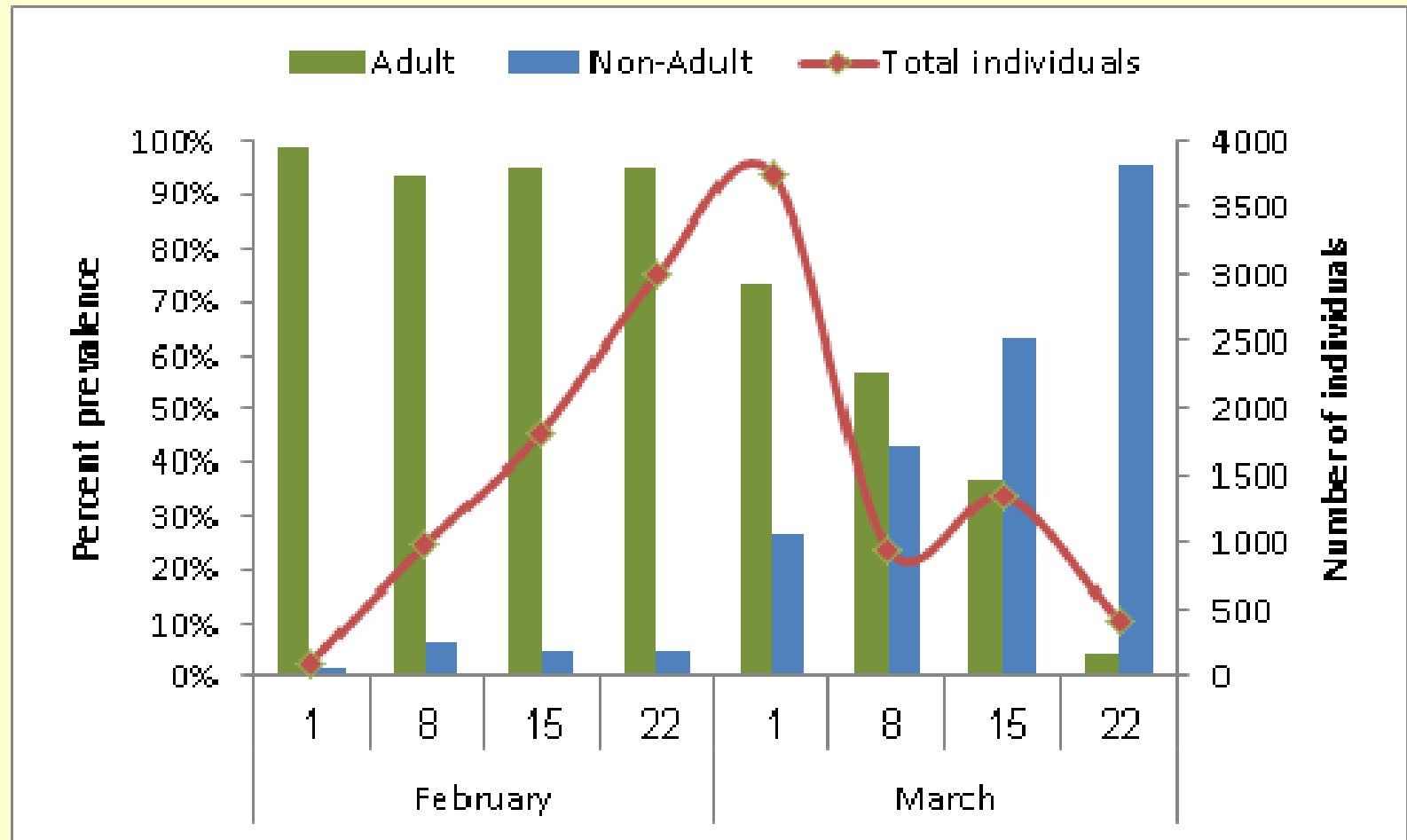
Mood's median test indicated that there was no significant difference among years in the median number of Steppe Eagles identified by age ( $X^2 = -0.80178$ ,  $P = 0.4228$ ). With respect to age classes, we got similar results: there were no significant differences in the number of juveniles ( $Z = -1.3933$ ,  $p\text{-value} = 0.1639$ ), immatures ( $Z = 1.2254$ ,  $p\text{-value} = 0.2202$ ), or adults ( $Z = -0.80396$ ,  $p\text{-value} = 0.4216$ ) during the three years of the study



# Age reported eagles 2016-2018 – numbers



# Age - percentage



- In total 72% are adults and 28% are non adults.
- In Feb 95% are adults.
- In March only 40% are adults.

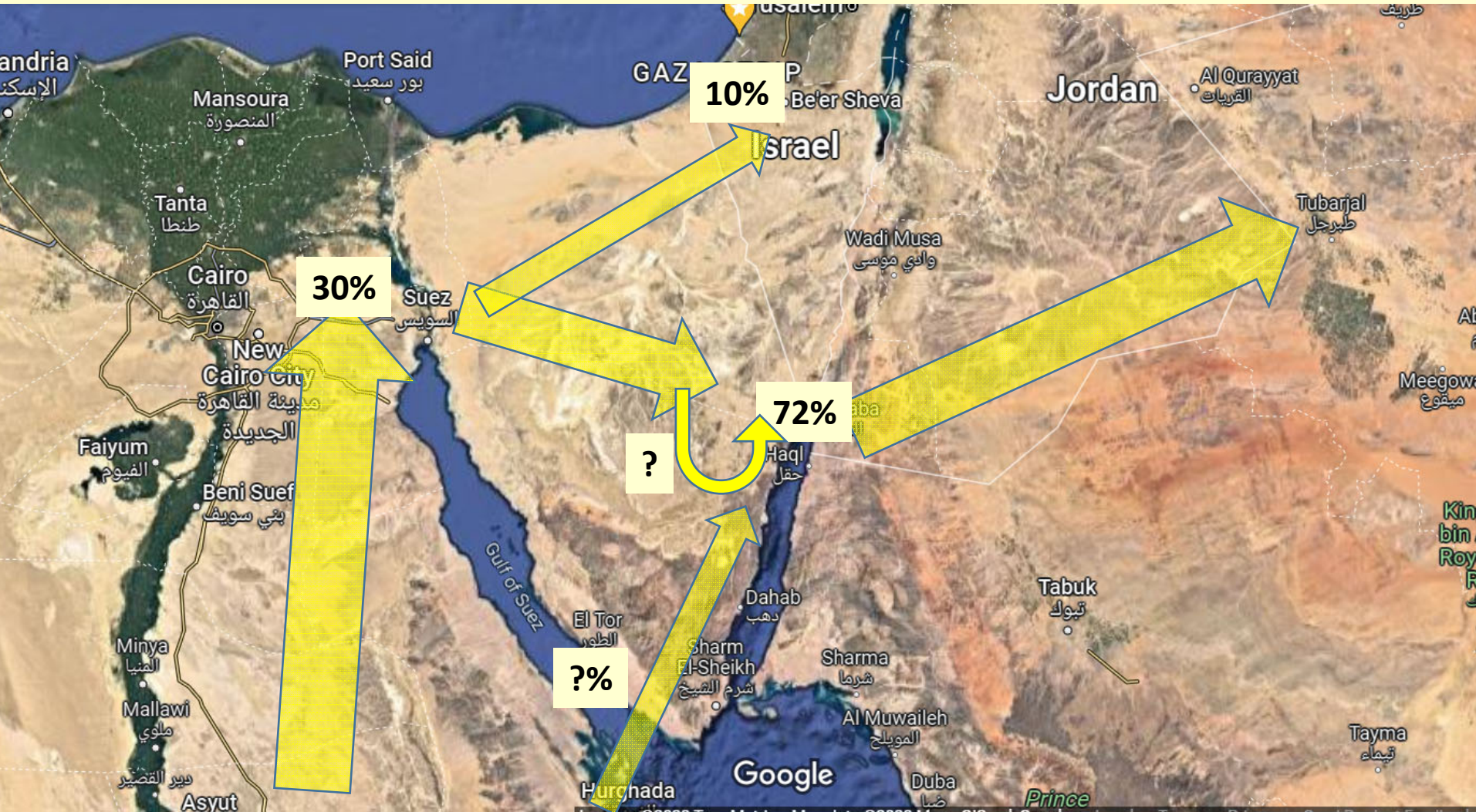
# Comparing population structure in other sites in Spring

Count	Eilat 2016-18	Eilat (Shirihai and Christie 1992)	Beersheva (Ben Zohar 1986)	Suez (Bruun 1985)
Adult	72%	70-60%	10%	30%
Subadult	28%	30-40%	90%	70%

\*Timing of survey might be a partial explanation  
(Suez, 25/2, Beersheva, March, but we don't see these Eagles there before March)



# On a map Percentage of Adults in the different count spots



# Maybe on a larger scale? More data is needed

Eilat (Spring)			Thoolakharka, Nepal (Autumn), Subedi			de Roder
Adult	5308	72,03%	Adult	1667	42,58%	44%
Immature	1304	17,7%	Immature	1456	37,19%	28%
Juvenile	757	10,27%	Juvenile	792	20,23%	28%
Total aged	7369		Total aged	3915		

**We might need some:**

- **Spring surveys from the eastern flyway**
- **Autumn survey's on the western flyway**

# Results summary

- Different age group's phenology differs. Adults leave Africa earlier or travel faster.
- Different age groups migrate via different routes.
- Eilat's bottle-neck is used mainly by adults (72%).



# Community based conservation The Eilat Bird Sanctuary



# Community based conservation The Eilat Bird Sanctuary



**הערבה  
הדרומית**






# Community based conservation site

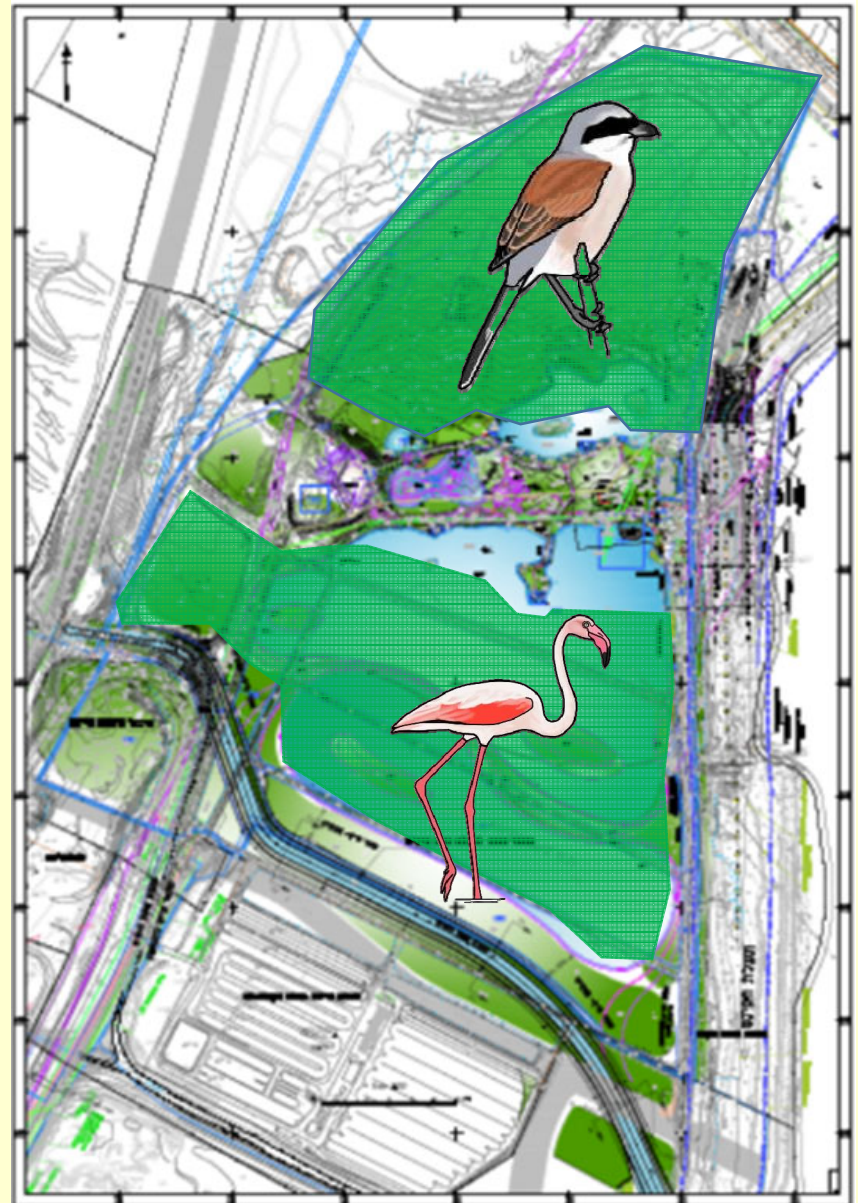
## Principals

- 🦋 Site specific to needs
- 🦋 Size
- 🦋 Heterogeneity
- 🦋 Quality of habitats
- 🦋 Core areas
- 🦋 Maximize nature based assets
- 🦋 Buffer zones – from surroundings and human activity within the site.
- 🦋 The first step in planning is maintenance... what resources we have?  
Where? Price?

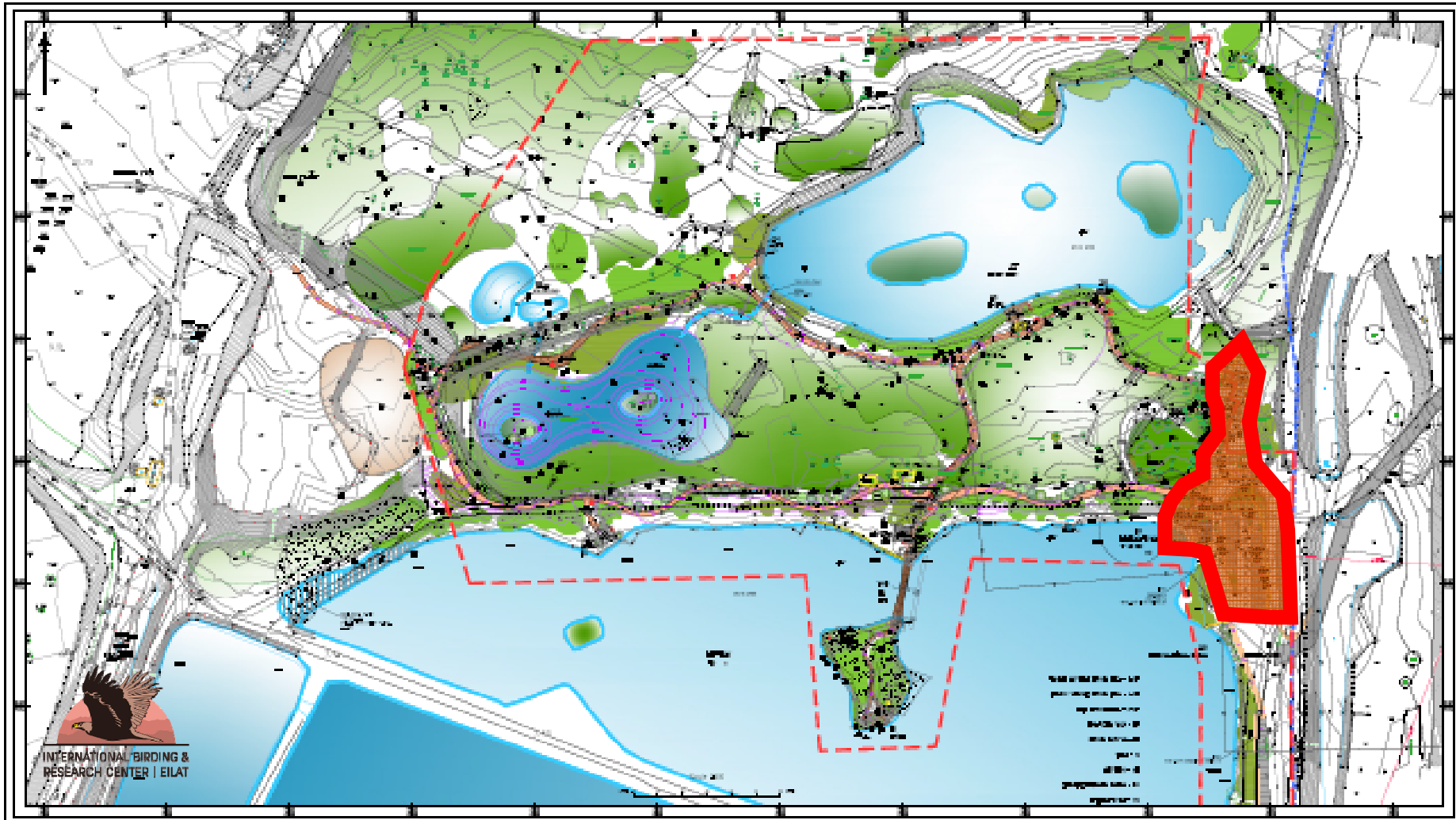


# Natural assets




-  Maximal protection of Core areas.
-  Make sure you can maintain and make changes.
-  Monitor and manage accordingly.



# Visitor's infrastructure – intensive Environmental culture hub



# Environmental Culture hub intensive

-  Accessibility.
-  Generosity.
-  Service.



Free Entrance  
It's an open space

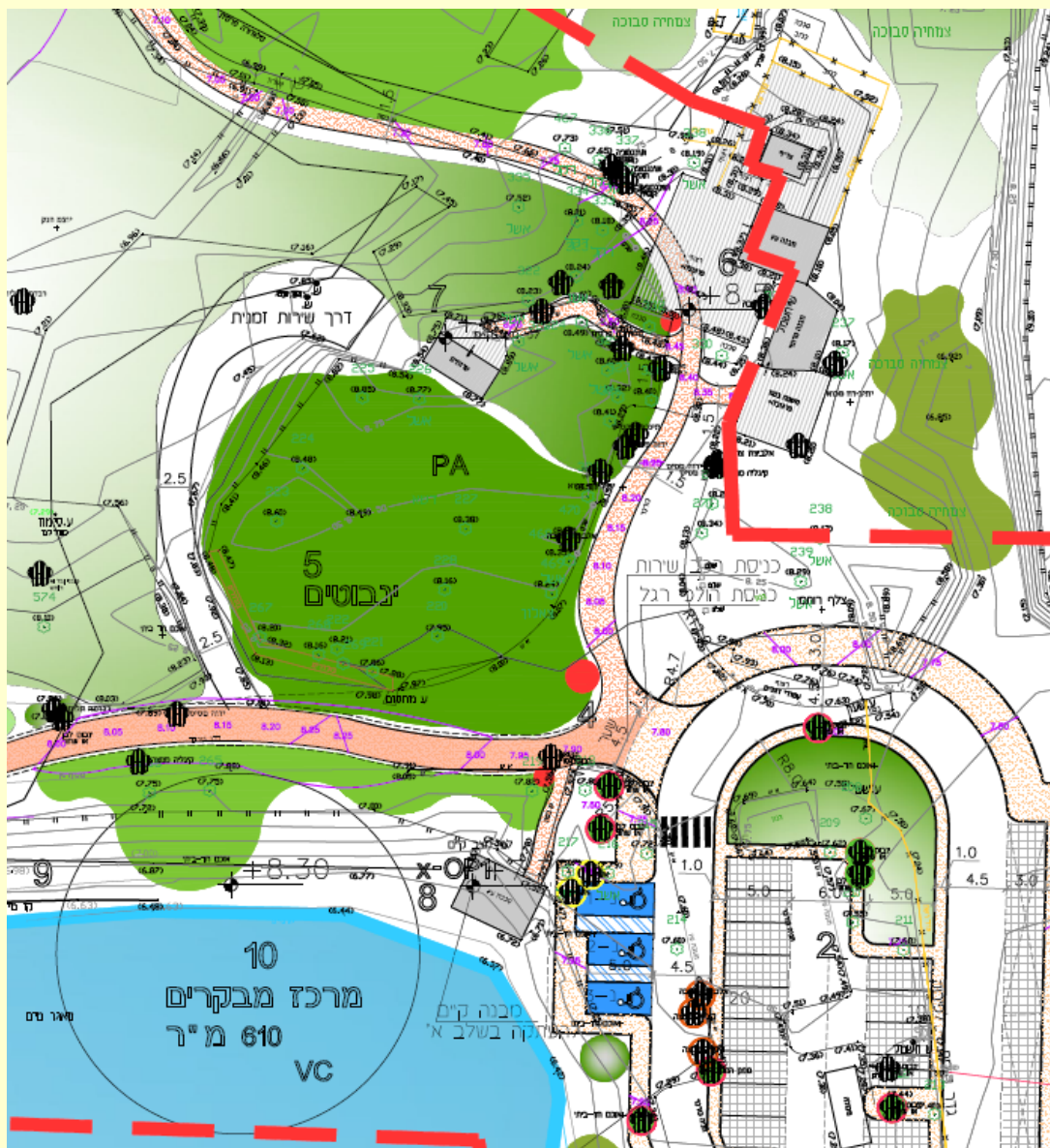
# Environmental Culture hub intensive

- 🐦 A place to talk to 200 people.
- 🐦 3 places to guide 50 people.
- 🐦 The ringing station.
- 🐦 Exemplary garden.
- 🐦 Birding center for kids (and adults too).



# Environmental Culture hub intensive

- ➔ It's your second home!
- ➔ It's the community's env. Art gallery.
- ➔ It's where you do environmental events.
- ➔ Music? Theatre? Any kind of culture.
- ➔ Any important event.
- ➔ Even for a wedding!

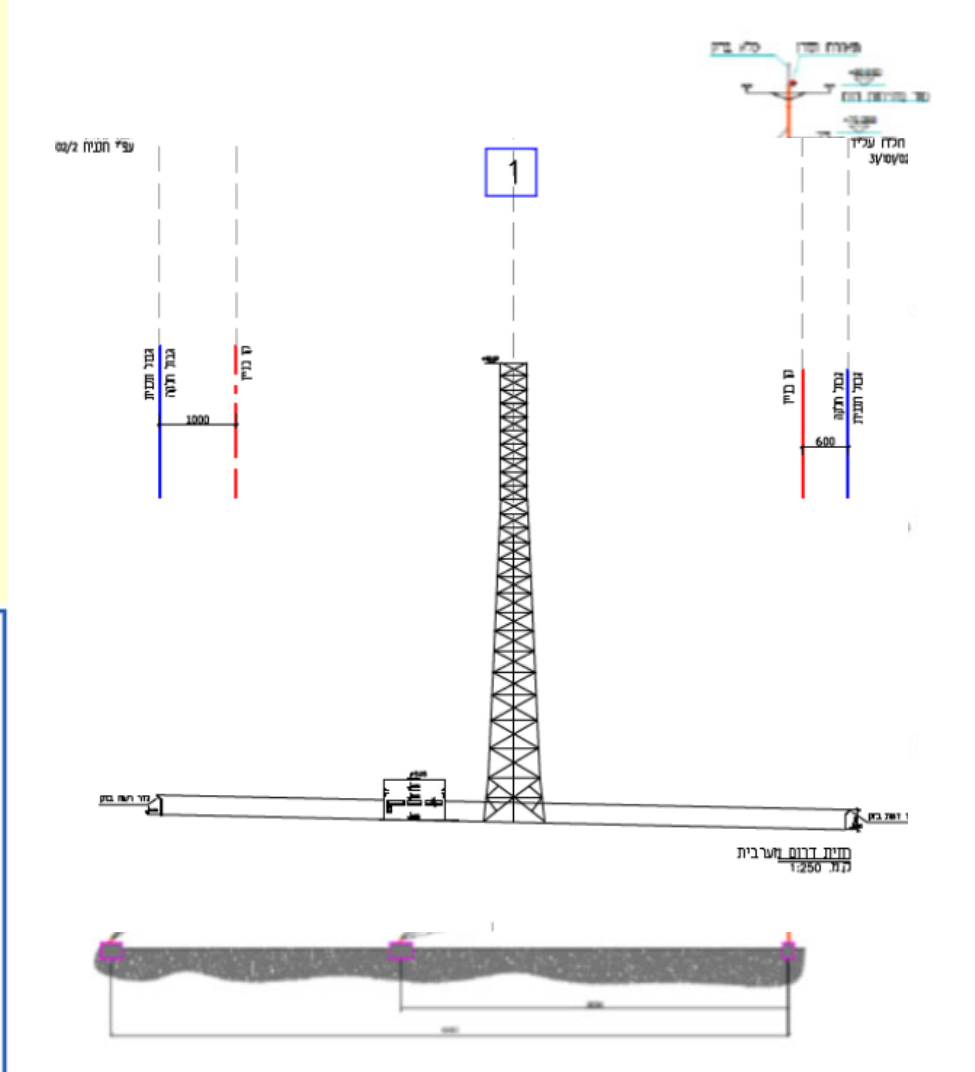
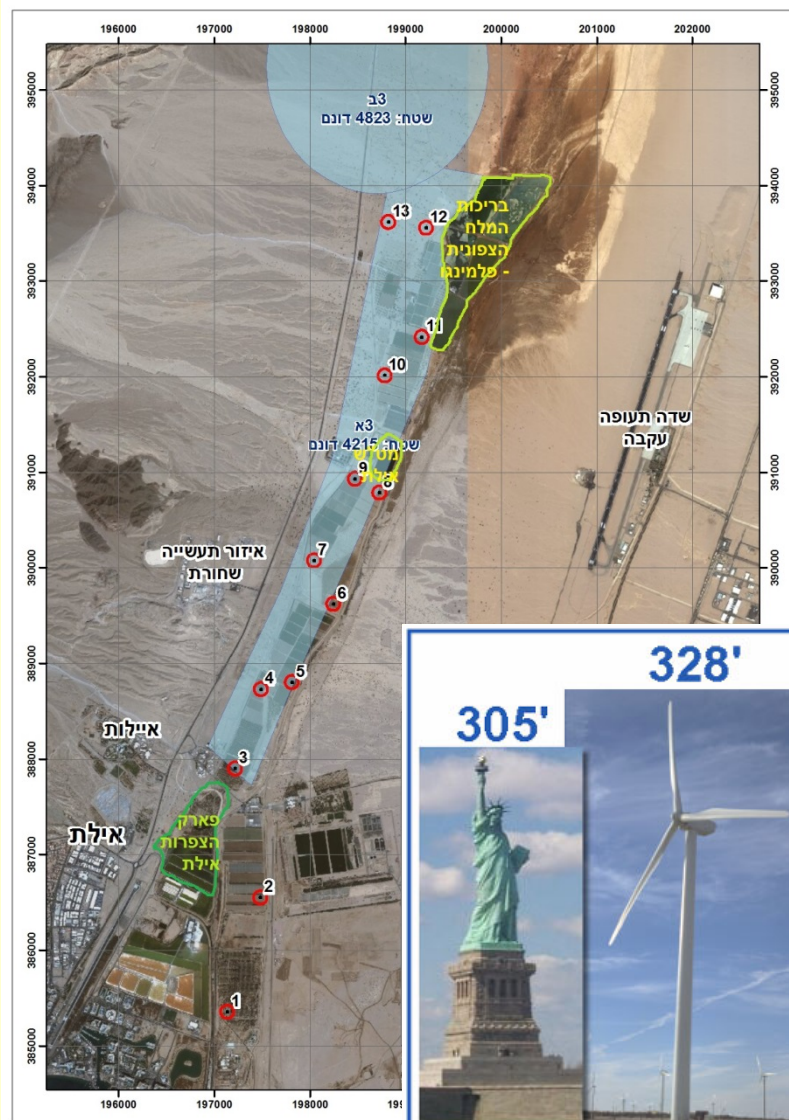


# Environmental Culture hub intensive

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# Successful campaigns to safeguard the Eagles in Eilat



Flight safety



# A masterplan for stopover sites

Ovda Valley



Neot Smadar



Ka Saidin



Fields and Orchards



The Flamingo pools



Seifim Plain



The Bird Sanctuary

Eilat Sewage ponds



The Raptors Flyway



Holland and other urban Parks



North beach



# Water and drinking safety



# Environmental management plan for Eilat's sewage works



# Key species using the reservoir



# A new site plan – for bio diversity



התכנית המוצעת

פעולות לשימור ושיפור  
המגוון הביולוגי

# A new site plan – for bio diversity



Flooded pool

Safe perch  
for birds

Changing banks  
vegetation management

Island with  
vegetation

Safe perch  
for birds



התכנית המוצעת

פעולות לשימור ושיפור  
המגוון הביולוגי

שלף, מטל

**טבע BIZ**  
עסקים שומרים על המגוון הביולוגי

# A new site plan – for bio diversity



# Our next project – Kibbutz Neot Smadar





# International regional workshops and courses

## Guardians of the Flyway



צילום: יובל דקס



**Israel Nature and Parks Authority**  
**Safe food available**  
**(Not yet in Eilat)**





# Join the Eilat raptor count 2024 – 2027!

## 1 Feb – 10 Apr

[noamw@spni.org.il](mailto:noamw@spni.org.il)



INTERNATIONAL BIRDING &  
RESEARCH CENTER | EILAT

Thank you

