ENVEROS
ENVIRONMENTAL EDUCATION THROUGH ROADKILL OBSERVATION SYSTEMS

http://www.enveros.eu/

2018-1-CY01-KA204-046919

Enviromental Education through Roadkills Observation Systems - EnVeROS

06. WVC MONITORING

Erasmus+ OPEN UNIVERSITY OF CYPRUS eurac research TRANSPORT RESEARCH CENTRE TERRA CYPRIA

ENVEROS
ENVIRONMENTAL EDUCATION THROUGH ROADKILL OBSERVATION SYSTEMS

LEARNING OBJECTIVES

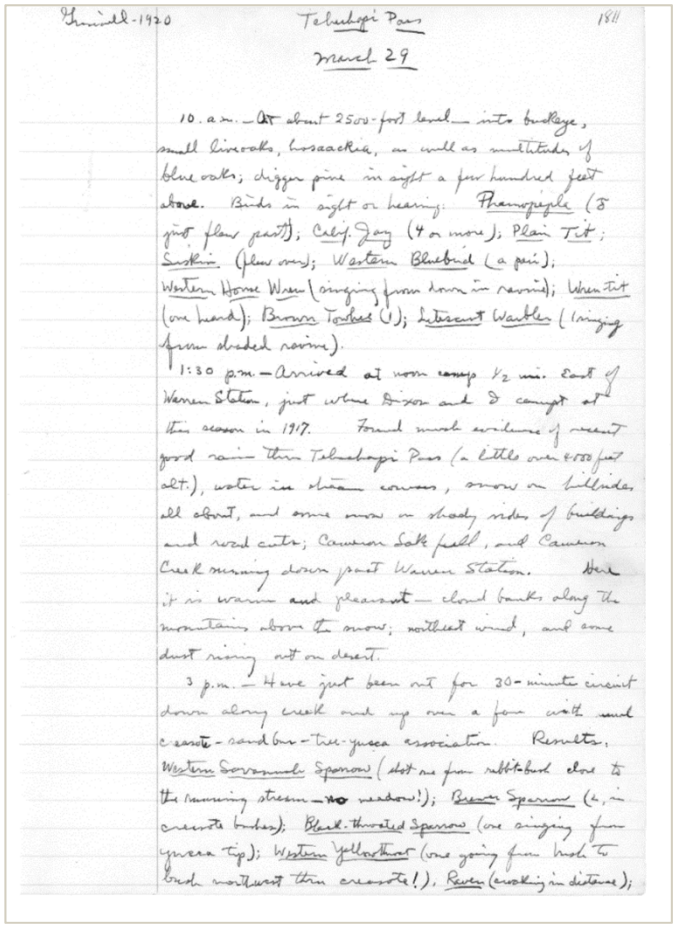
At the end of this topic students should be able to:

- Summarize the evolution of roadkill monitoring systems through time.
- Describe modern technologies for roadkill monitoring and mitigation.
- Value the existing On-line platforms/databases for roadkill monitoring.
- Identify opportunities for further research on roadkill monitoring.

Erasmus+

ENVEROS
ENVIRONMENTAL EDUCATION THROUGH ROADKILL OBSERVATION SYSTEMS

Review of monitoring systems through time



Museum of Vertebrate Zoology at Berkeley

~ 1920

Joseph Grinnell (California State highway)

Yesterday noted: Jack Rabbit (many); Cottontail (many,) . . . Kangaroo Rat; Bushey Ground Squirrel; Skunk; domestic dogs and cats; Meadowlark (2 or more); Bullock Oriole; Mockingbird.

"This is a relatively new source of fatality; and if one were to estimate the entire mileage of such roads in this state, then mortality must amount into the hundreds and perhaps thousands every 24 hours."

Erasmus+

ENVEROS
ENVIRONMENTAL EDUCATION THROUGH ROADKILL OBSERVATION SYSTEMS

Review of monitoring systems through time

Between 1920 and today a lot of things have changed…

- ⇧ Vehicle speed
- ⇧ Density of road network
- ⇧ Length and width of roads
- ⇧ Number of cars

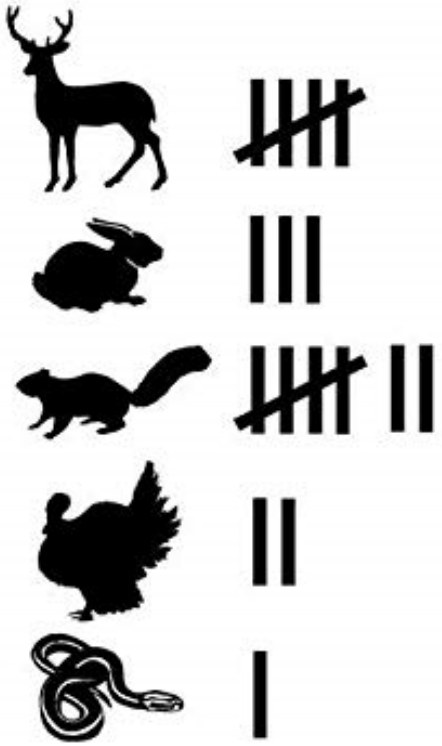
Erasmus+

ENVEROS
ENVIRONMENTAL EDUCATION THROUGH ROADKILL OBSERVATION SYSTEMS

Review of monitoring systems through time

…while the monitoring practice remained the same

People stopping at the site of the road, taking notes on paper, indicating approximately the location of the incident and taking pictures if possible…



(Photo: California Roadkill Observation System)

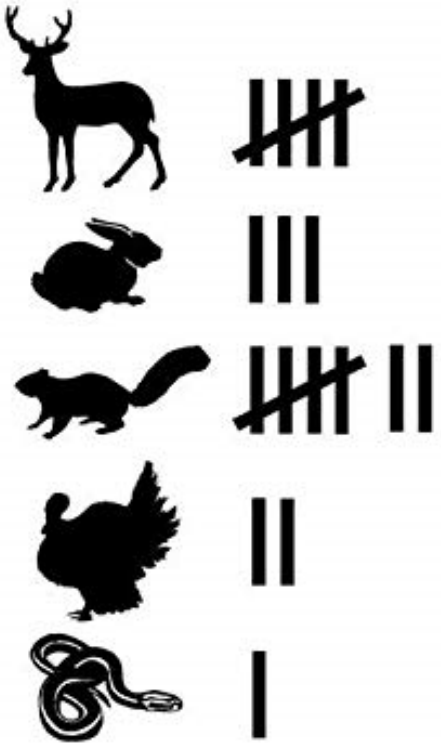
Erasmus+

ENVEROS
ENVIRONMENTAL EDUCATION THROUGH ROADKILL OBSERVATION SYSTEMS

Increased interest in WVC monitoring

One thing that changed during that period was

⇧ the number of WVC incidents recorded



Besides ecologists and naturalists several other stakeholders initiated monitoring practices, recording WVC for their own reasons/ purposes.

- Public authorities / Government departments
- Environmental NGOS
- Organized citizens or just individuals

Erasmus+

ENVEROS
ENVIRONMENTAL EDUCATION THROUGH ROADKILL OBSERVATION SYSTEMS

Problems with the “classic” (pen and paper) monitoring method

The “pen & paper” method is problematic:

- Low spatial resolution
- Various inaccuracies
- Lag of consistency on recording information
- Loss of data between recording and saving on database
- Difficult to digitalize and analyse

Due to the above, a large volume of recorded information cannot be used to develop management plans nor contribute to the reduction or successfully control the WVC phenomenon.

A black bear crosses the Glacier Spur Road in August 2008.
(Photo: Michael Penn | Juneau Empire)

Erasmus+

ENVEROS
ENVIRONMENTAL EDUCATION THROUGH ROADKILL OBSERVATION SYSTEMS

Need for accurate information

Accurate information on WVC with a standardized form is required to develop management measures able to protect both fauna and habitats and secure human health and safety.

A proper allocation of resources on strategically selected areas/road segments is essential to maximize the impact on travellers and wild fauna.

Collecting an extensive volume of data from large areas (e.g. at country level) requires the development of an efficient and accurate recording and analysing system.

(Photo: Václav Šlauf, MAFRA, Czech Republic)

(Source: https://qz.com/1605449/wildlife-overpasses-that-protect-animals-are-spreading-globally/)

Erasmus+

ENVEROS
ENVIRONMENTAL EDUCATION THROUGH ROADKILL OBSERVATION SYSTEMS

Modern technologies for accurate WVC reporting

Global Positioning System (GPS)

Accurate coordinates
Date
Time

Smartphones & online platforms

Digitalizing on the spot main information

- Standardize input information
- Automatic processing and analysis
- Easy export and overview of selected information

- Increase spatial accuracy
- Reduce errors
- Improve digitalize and analysis of data

Erasmus+

ENVEROS
ENVIRONMENTAL EDUCATION THROUGH ROADKILL OBSERVATION SYSTEMS

Examples for On-line platforms/databases

Maine Audubon
Wildlife Road Watch

2011

2016

RoadWatchBC

2010

Taiwan Roadkill Observation Network

2009CROS

2008

LINKING LANDSCAPES FOR MASSACHUSETTS WILDLIFE

SISTEMA URUBU

2011

Wildlife and Roads
2012

Erasmus+

ENVEROS
ENVIRONMENTAL EDUCATION THROUGH ROADKILL OBSERVATION SYSTEMS

On-line platforms /databases Europe

ANIMAL-VEHICLE COLLISIONS

PROJECT SPLATTER

Observation.org

Roadkill
www.roadkill.at

Wildlife Incident Reporting Apps

life strade

wuidi

CyROS

Erasmus+

ENVEROS
ENVIRONMENTAL EDUCATION THROUGH ROADKILL OBSERVATION SYSTEMS

Example for importing WVC incidents

CyROS

General

Species group (*) Choose...

Species name (*)

Other

How certain are you?
- (•) Absolutely certain (100%)
- ( ) Almost sure
- ( ) Not sure

Information on the species found

When

Date (*)

Time (*)

Estimated time of death Less than 3 hours

How often you pass through this road Daily

Who

Name Anonymous

E-mail

Contact phone number

Additional information

Type of road Highway – 4 lanes

Other factors and observation notes

PHOTO

Add photos, if you have Browse... No files selected.

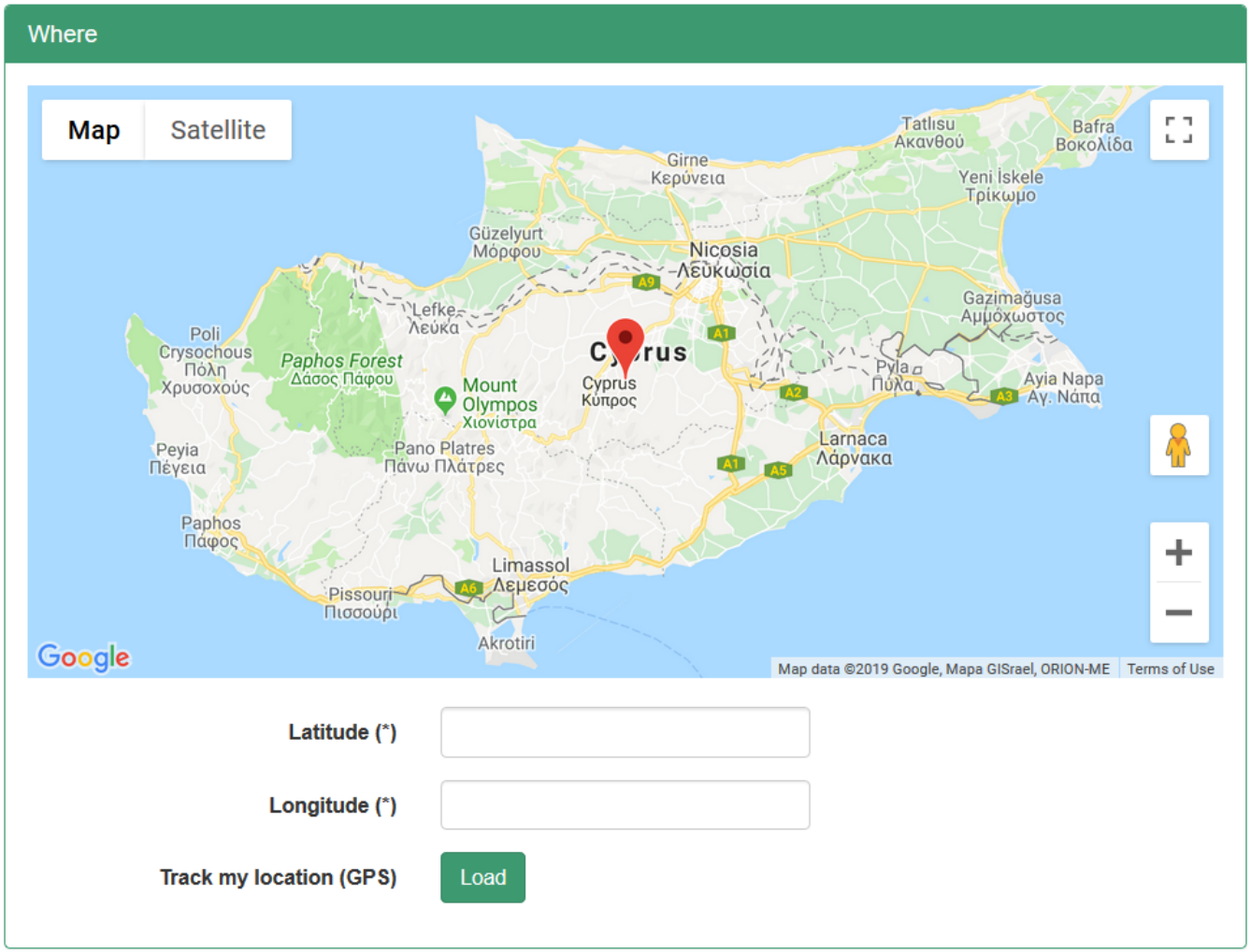
(https://cyroadkills.org/add/)

Erasmus+

ENVEROS
ENVIRONMENTAL EDUCATION THROUGH ROADKILL OBSERVATION SYSTEMS

CyROS

Importing WVC incidents



(https://cyroadkills.org/add/)

Erasmus+

ENVEROS
ENVIRONMENTAL EDUCATION THROUGH ROADKILL OBSERVATION SYSTEMS

Type of entries on platforms/databases

1. Random recordings

Citizen science

- The majority of all records
- Indicative for the extensive volume of WVC incidents that are not recorded

2. Adopt a road / route

3. Systematic survey (Government departments / Research centres)

They take into consideration absence of WVC too

- They can be implemented by people / organizations that are using almost daily the road network

Erasmus+

ENVEROS
ENVIRONMENTAL EDUCATION THROUGH ROADKILL OBSERVATION SYSTEMS

How can we process the data collected?

ANIMAL-VEHICLE COLLISIONS

http://srazenazver.cz/en

- Road segments (Police data)
- Graphs and charts
- Economic impact
- Interactive models
- Correlating with types of conservation/management areas (e.g. hunting reserves)

Erasmus+

ENVEROS
ENVIRONMENTAL EDUCATION THROUGH ROADKILL OBSERVATION SYSTEMS

Summary

- Roadkill observations started in the previous century, when some biologists realized that roads have impact on wildlife.
- Road network expansion and cars evolution increased the severity of the problem during the 20th century.
- Early in the 21st century a plethora of on-line platforms and monitoring systems have been developed.
- The establishment and operation of such a system requires several factors to be considered for the best possible results.

Erasmus+

ENVEROS
ENVIRONMENTAL EDUCATION THROUGH ROADKILL OBSERVATION SYSTEMS

Selected references

- Bíl, M., Andrášik, R., Svoboda, T., Sedoník, J., 2016. The KDE+ software: a tool for effective identification and ranking of animal-vehicle collision hotspots along networks. Landscape Ecology 31, 231–237. doi: 10.1007/s10980-015-0265-6
- Zotos, S., Vogiatzakis, I., 2018. CyROS: Towards a common methodological framework for roadkills recording in Cyprus. Ecologia Mediterranea, 44: 109-114.
- Gunson, K.E., Mountrakis, G., Quackenbush, L., 2011. Spatial wildlife-vehicle collision models: A review of current work and its application to transportation mitigation projects, Journal of Environmental Management,Volume 92 (4):1074-1082
- Neumann, W., Ericsson, G., Dettki, H., Bunnefeld, N., Keuler, N.S., Helmers, D.P., Radeloff, V.C., 2012. Difference in spatiotemporal patterns of wildlife road-crossings and wildlife-vehicle collisions. Biological Conservation, 145 (1): 70-78.

Erasmus+

ENVEROS
ENVIRONMENTAL EDUCATION THROUGH ROADKILL OBSERVATION SYSTEMS

Activities & Self Assessment Exercises:

- Build a graph (one page) presenting the components and function of a roadkill monitoring system.

- Go to https://www.cyroadkills.org/home/ and access the species list and the newsletters in the documents section. Using 250 words illustrate the situation regarding roadkills in Cyprus.

- Set up a monitoring process regarding roadkill, for a species in an area of your choice. What are the factors that you need to consider in the design?

- Go to http://www.srazenazver.cz/cz/ and after studying the data: 1) present the most impacted species; 2) the hotspots in the country's road network and 3) the time of the day that most accidents occur, during Spring.

Erasmus+