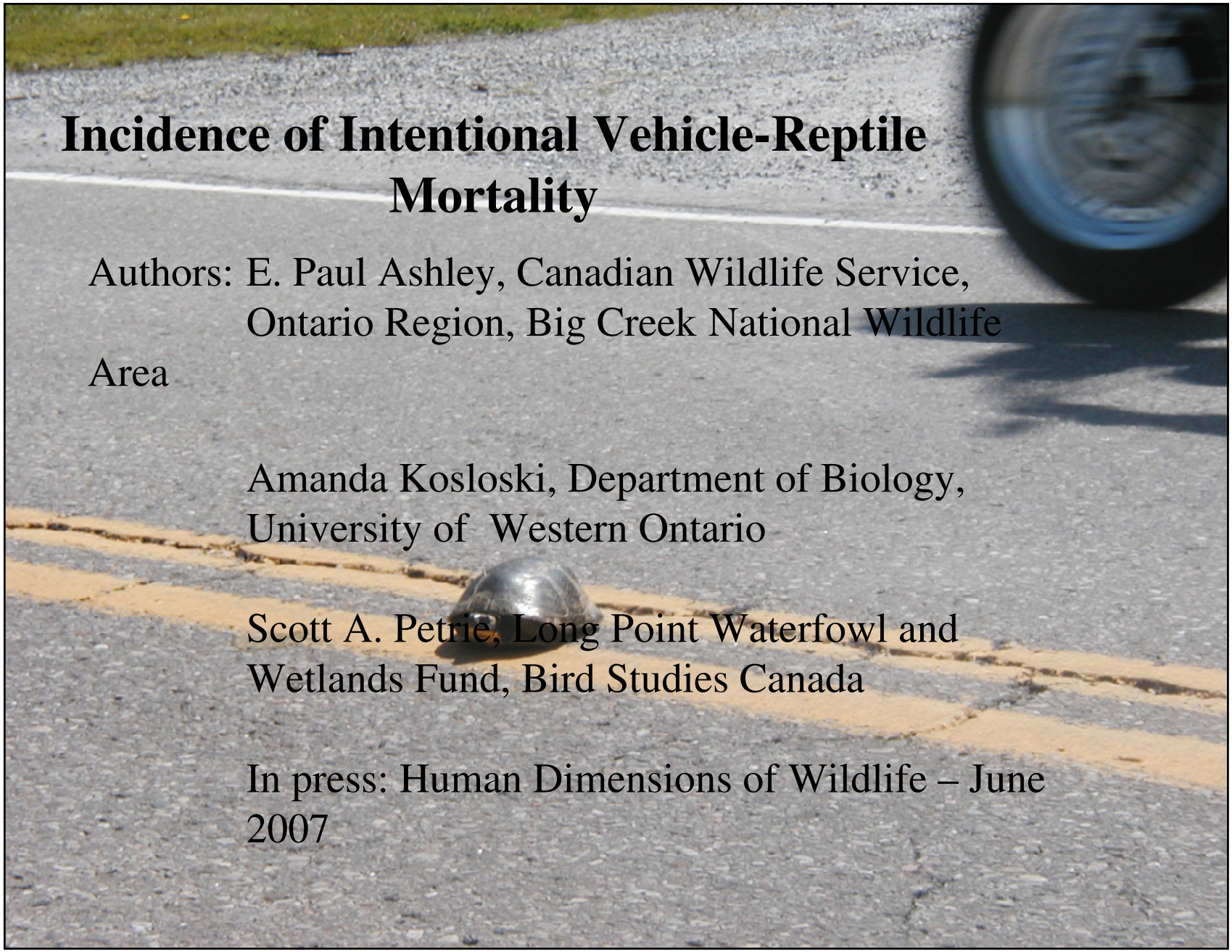


Incidence of Intentional Vehicle-Reptile Mortality

Authors: E. Paul Ashley, Canadian Wildlife Service, Ontario Region, Big Creek National Wildlife Area

Amanda Kosloski, Department of Biology, University of Western Ontario

Scott A. Petrie, Long Point Waterfowl and Wetlands Fund, Bird Studies Canada

In press: Human Dimensions of Wildlife – June 2007


N
86
6
7
401
QEW
Toronto
7
Cambridge
8
Hamilton
59
24
403
QEW
Woodstock
56
19
24
6
3
401
London
3
73
19
Simcoe
59
Port
Burwell
Lake Erie
Long Point
U.S.A

Designations

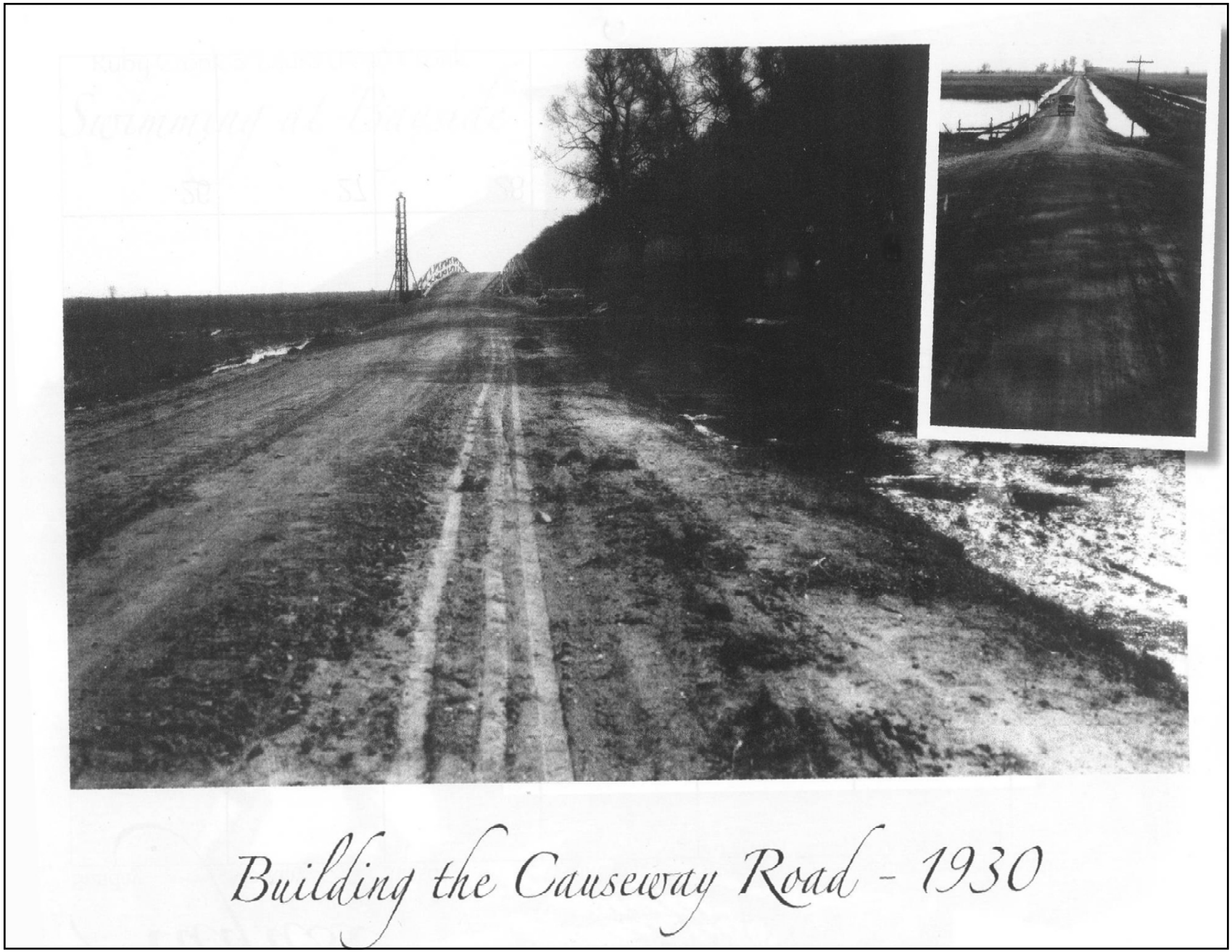
National Wildlife Area

Ramsar Site

World Biosphere Reserve

10 species of reptiles, including

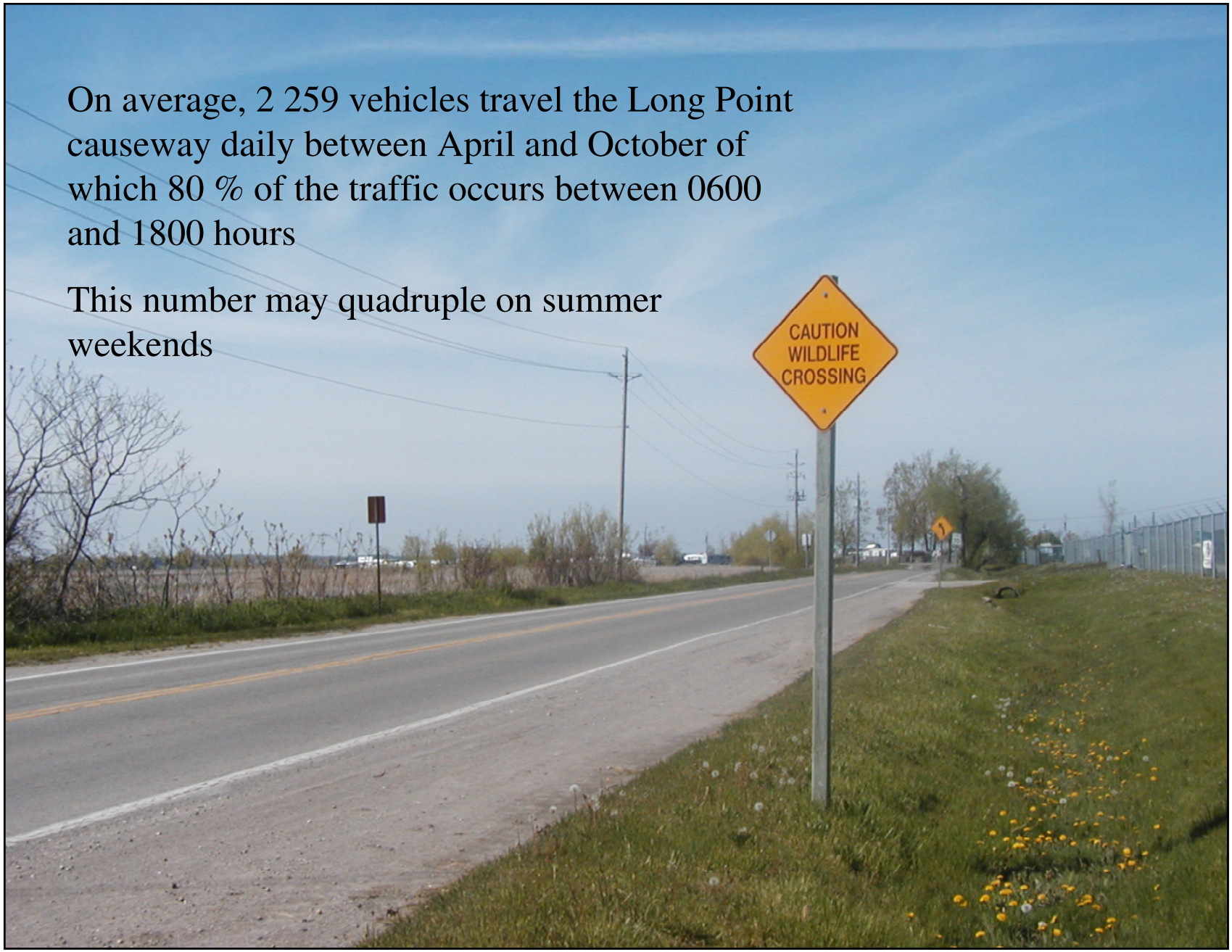
spotted turtle *Clemmys guttata,* Blanding's turtle *Emydoidea blandingi,* map turtle *Graptemys geographica*, Eastern fox snake *Elaphe gloydi* and Eastern hognose snake *Heterodon platyrhinos*

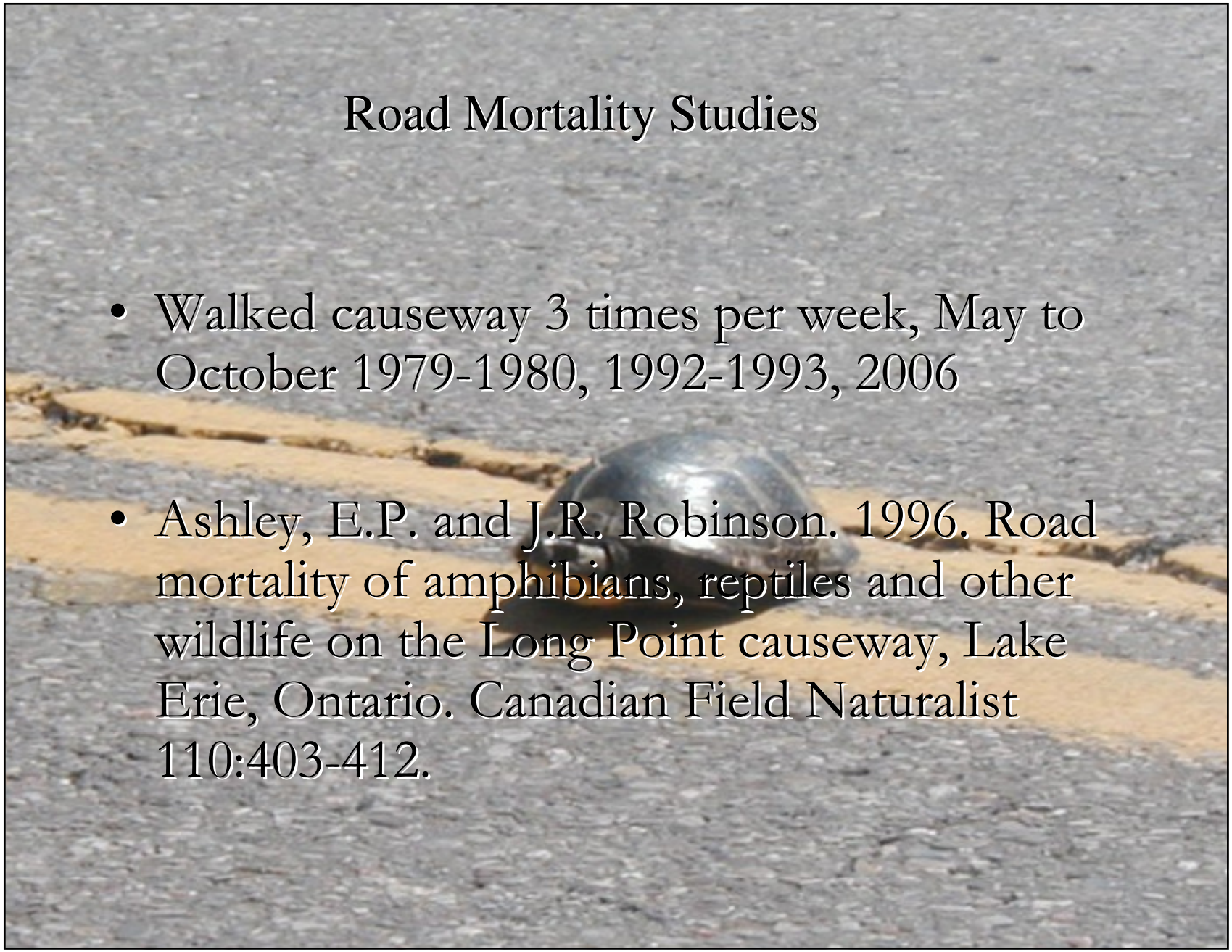


Building the Causeway Road - 1930

Causeway Construction

- Constructed in 1926 - 1927
- Facilitate development of beach community


On average, 2 259 vehicles travel the Long Point causeway daily between April and October of which 80 % of the traffic occurs between 0600 and 1800 hours
This number may quadruple on summer weekends
CAUTION
WILDLIFE
CROSSING



Road Mortality Studies

- Walked causeway 3 times per week, May to October 1979-1980, 1992-1993, 2006

- Ashley, E.P. and J.R. Robinson. 1996. Road mortality of amphibians, reptiles and other wildlife on the Long Point causeway, Lake Erie, Ontario. Canadian Field Naturalist 110:403-412.

Study Findings

- 100 vertebrate species, 7 amphibians, 10 reptiles, 21 mammals, 62 birds
- > 32 000 road-kills over study period
- Mostly leopard frogs, but also high incidence of turtles and some snakes
- Fourth worse documented road mortality of turtles world-wide

Were some of these mortalities intentional?

Incidence of intentional vehicle-reptile collisions on Long Point causeway

Ashley, Koloski and Petrie, 2006

Methods

- To observe driver behavior towards objects on the road we used two wildlife decoys (turtle, snake), a disposable cup and a biodegradable grease marker

Methods

- Responses by drivers to reptiles on the road may be categorized as those taken to:
- a) avoid a collision,
- b) intentionally strike an animal that would not be run over in the normal course of travel,
- c) rescue the animal or,
- d) no change in direction/behavior.
- Since placing the treatment directly in the line of traffic may jeopardize driver safety we placed treatments in the center of the road between the painted dashed lines.

Methods

- We conducted the study between July and October 2005 at three different sites
- Each site had clear lines of vision for drivers and allowed concealment of observers.
- Treatment order and site order were chosen randomly without replacement each day with daily observations lasting from 1 to 4 hours
- We placed treatments on the road for approximately 15 minute intervals to allow a large enough sample of vehicles to pass the treatment while minimizing the number of times individual cars passed the treatment more than once.

Methods

- We recorded only vehicles traveling by themselves (> 250 meters from another vehicle) and made our observations from a discrete location approximately 20 meters from the road.
- We included in the study the first 500 vehicles that passed by each treatment and met the spacing parameters.
- For each vehicle we recorded the gender of the driver and whether the vehicle hit, missed or rescued (stopped to remove the animal from the road) the treatment. We also recorded the elapsed time between each "hit".

Statistics

- We performed log-linear analysis to compare observed and expected frequencies, associations and interactions among variables, and considered statistical significance $p \leq 0.05$.
- To determine the incidence of intentional hits we subtracted the percentage of vehicles that ran over the control (grease line) from the percentage of vehicles that hit the reptile decoys

Results

- We observed 3,015 cars pass by our treatments, of which 66% (n = 2000) met our spacing requirements.
- Composition of drivers was 1,592 males and 408 females.
- Log-linear analysis indicated a 3-way interaction (x^2= 2376.17, df = 8, p = < 0.0001) between treatment, gender and fate.

Results

- Male drivers (n = 803) hit reptile decoys more often (n = 50) than female drivers (n = 197, 3).
- This resulted in 5.3 % of observed drivers hitting reptile decoys whereas 2.6 % inadvertently ran over the control.
- Drivers were 2.4 times more likely to hit the snake than the control and 1.9 times more likely to hit the snake than the cup.
- Similarly, drivers were 1.7 and 1.4 times more likely to hit the turtle than the control or cup respectively.
- Mean minutes per strike for each treatment were: 10.5 snake; 16.1 turtle; 18.3 cup and, 21.6 control.
- Thirty-three drivers stopped to rescue reptile decoys from the road with male and female drivers stopping at a similar rate (3.4 % and 3.0 % respectively).

Discussion

- Given that 2.7 percent of drivers intentionally target snakes and turtles, they could be potentially targeted about every 15 minutes, similar to our observed times.
- The actual rate of vehicle-reptile collisions (when reptiles are on the road) must be considerably greater than we have documented because we only accounted for those collisions that were for the most part intentional. We did not account for those accidental collisions which invariably occur when reptiles are found on the traveled portion, or kill zone of the highway.

Discussion

- Models developed to predict vehicle mortality impacts on reptile populations may underestimate the actual rate of vehicle collisions because the equation:

- road mortality = 1-(1-Pkilled)n crossings

  does not account for the intentionality of some collisions.

  We suggest the inclusion of an intentionality factor (*i*) be added where *i* = the percent of passing motorists that intentionally hit reptiles when they are on the road.

Discussion

Although *i* is a small percentage of the total drivers, given moderate to heavy traffic volumes, intentional hits could be a significant component of the total road mortality experienced by a population.

Example: at Long Point, 250 vehicles per busy summer day may be intentionally trying to hit reptiles on the road (if present on road).

A system of wildlife barriers and underpasses along areas of high reptile use may be the only means to prevent intentional and accidental reptile deaths and maintain populations in areas where there is a substantial network of roads or high traffic volumes.