

Road Ecology Center
University of California, Davis



Highlights of Road Ecology Research

Alison M. Berry

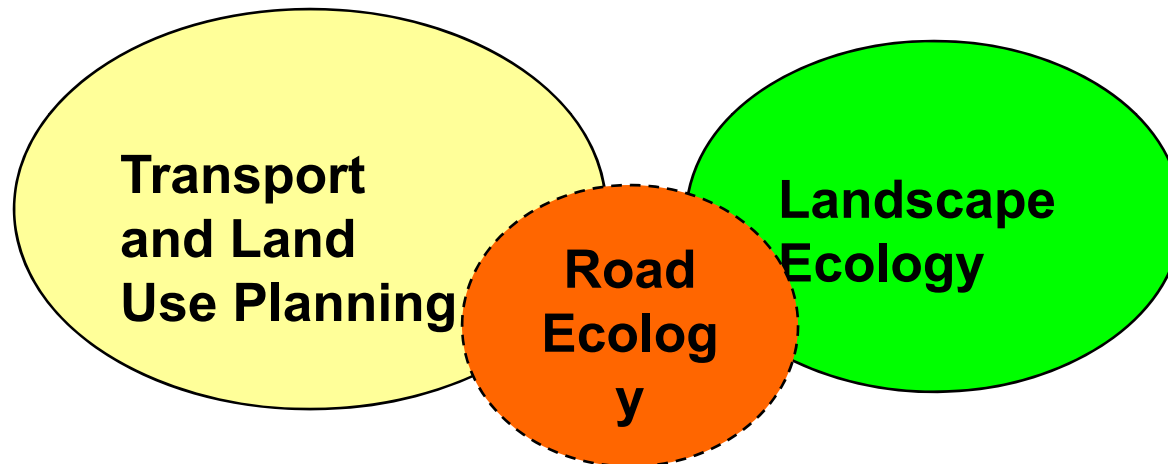
PATH-UTC Conference October 30, 2007



What is Road Ecology?

Road ecology...

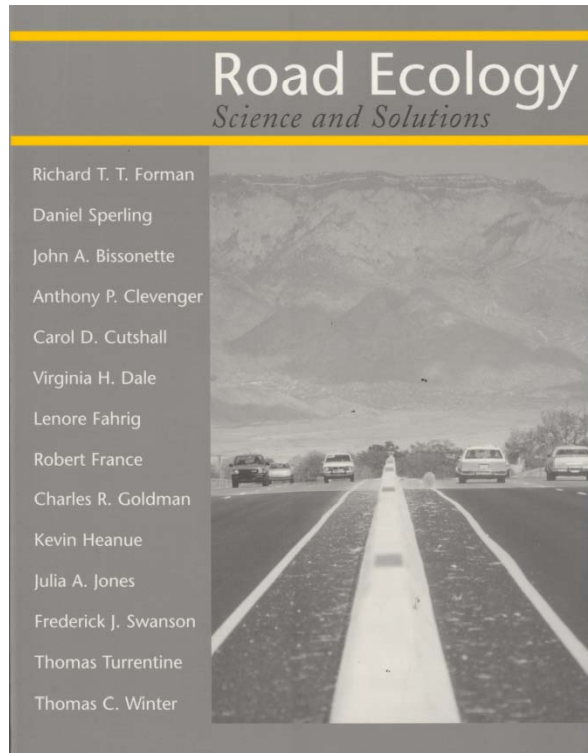
- *Studies the interactions between road systems and the surrounding natural and human environments.*



- *Integrates ecological sciences, engineering, and social sciences.*

Seeks to develop transportation solutions that are environmentally and socially sustainable.

...An Emerging Field



First publication: 2002

*UC Davis Road Ecology Center
2003-04*

*2006: TRB Committee on Ecology
& Transportation (ADC30)*

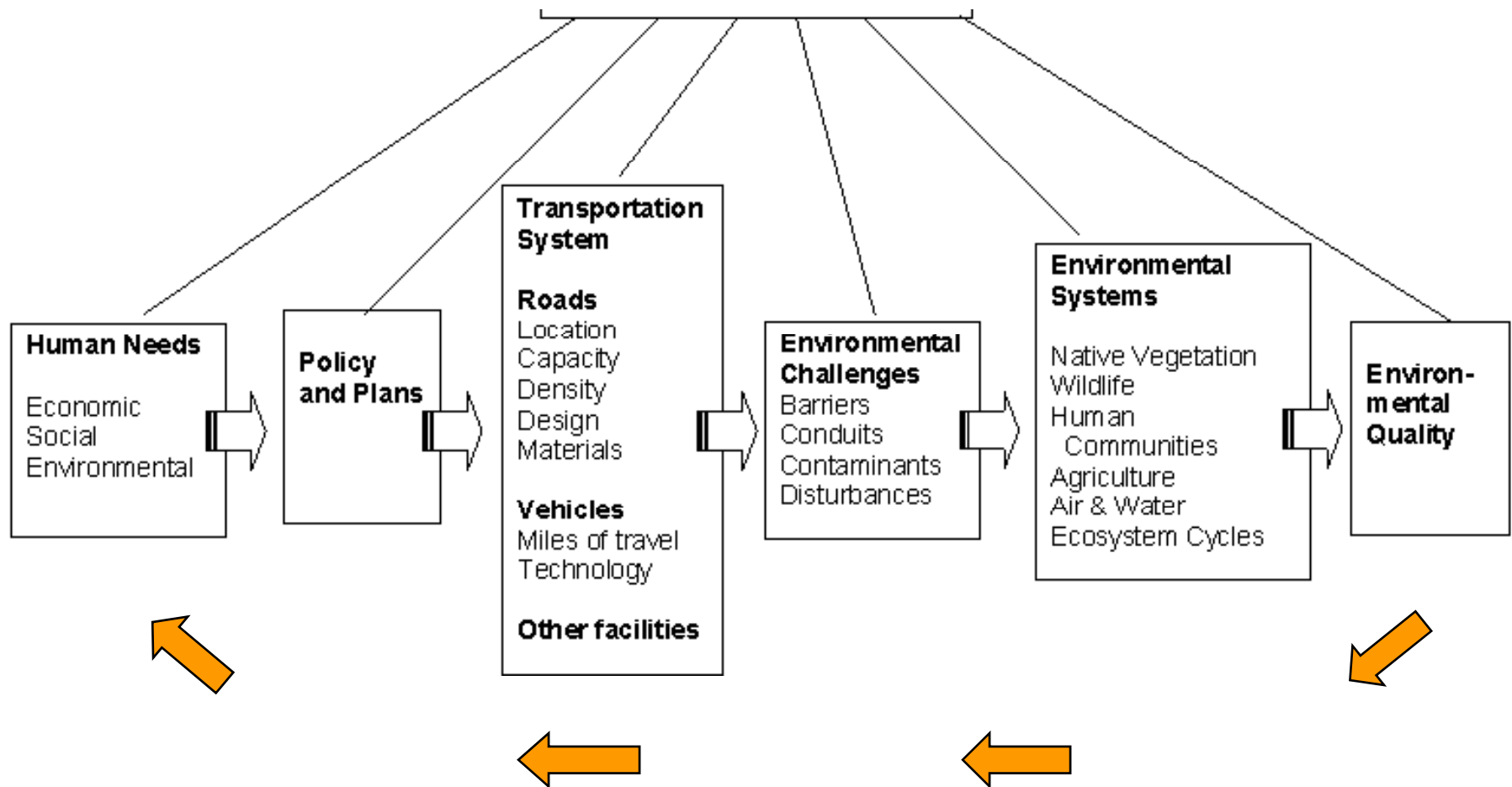
*2008: 4th International
Conference on Ecology &
Transportation (ICOET)*



Road Ecology Roadmap

...Integration is the Key to Problem-Solving

Research, Education, Collaboration





Highlights of Current Research

I. *Wildlife habitat* – a new metric for managing fragmentation and connectivity

II. *Integrating roadside management* -- the “Road Effect Zone”

Today's Landscapes: Ecological Gradients



Urban

Suburban

Cultivated

Managed

Natural

Fragmentation

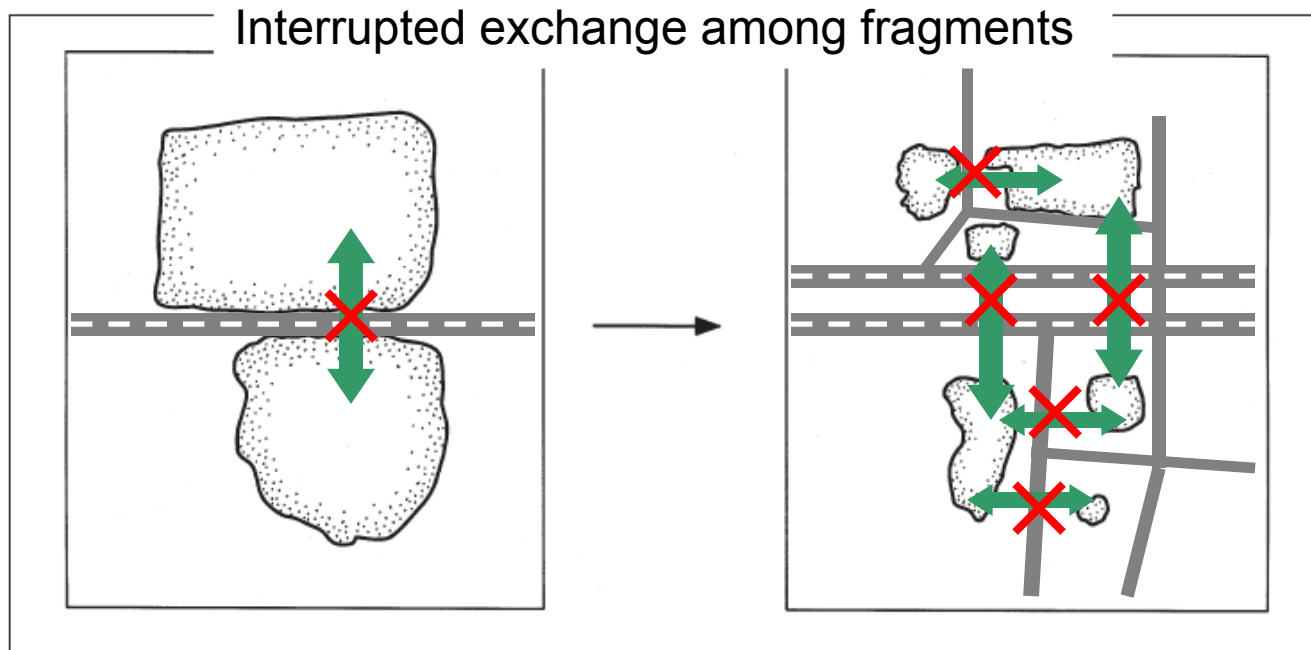
Connectivity

Developed ↔ Natural

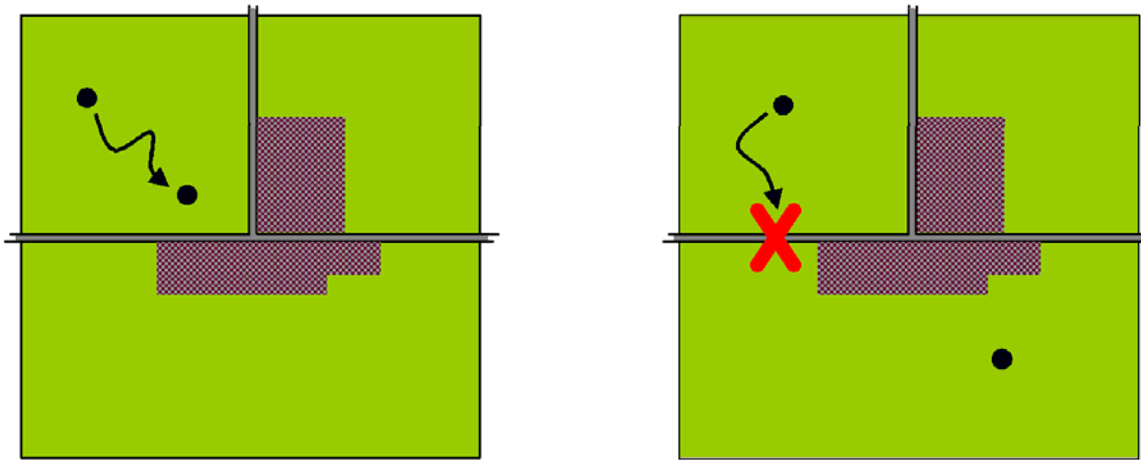
(Thorne 1993)

I. Wildlife Habitat

Roads fragment landscapes and habitat



How to Include Wildlife Connectivity in Transportation Planning?

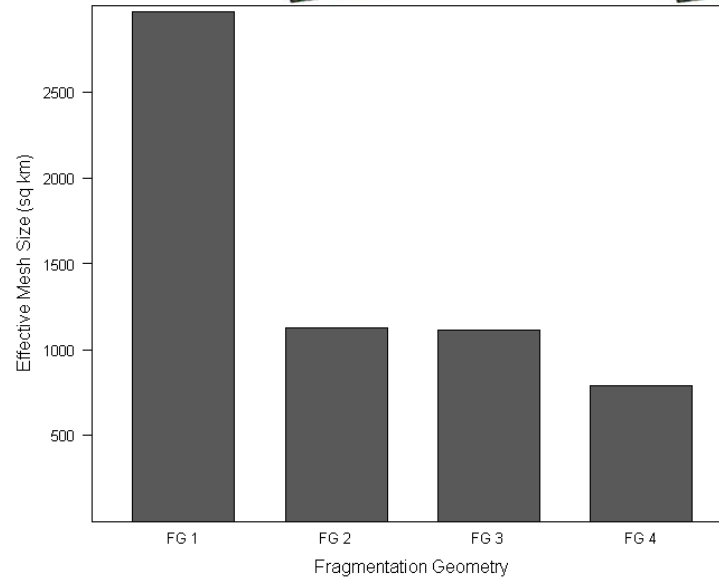
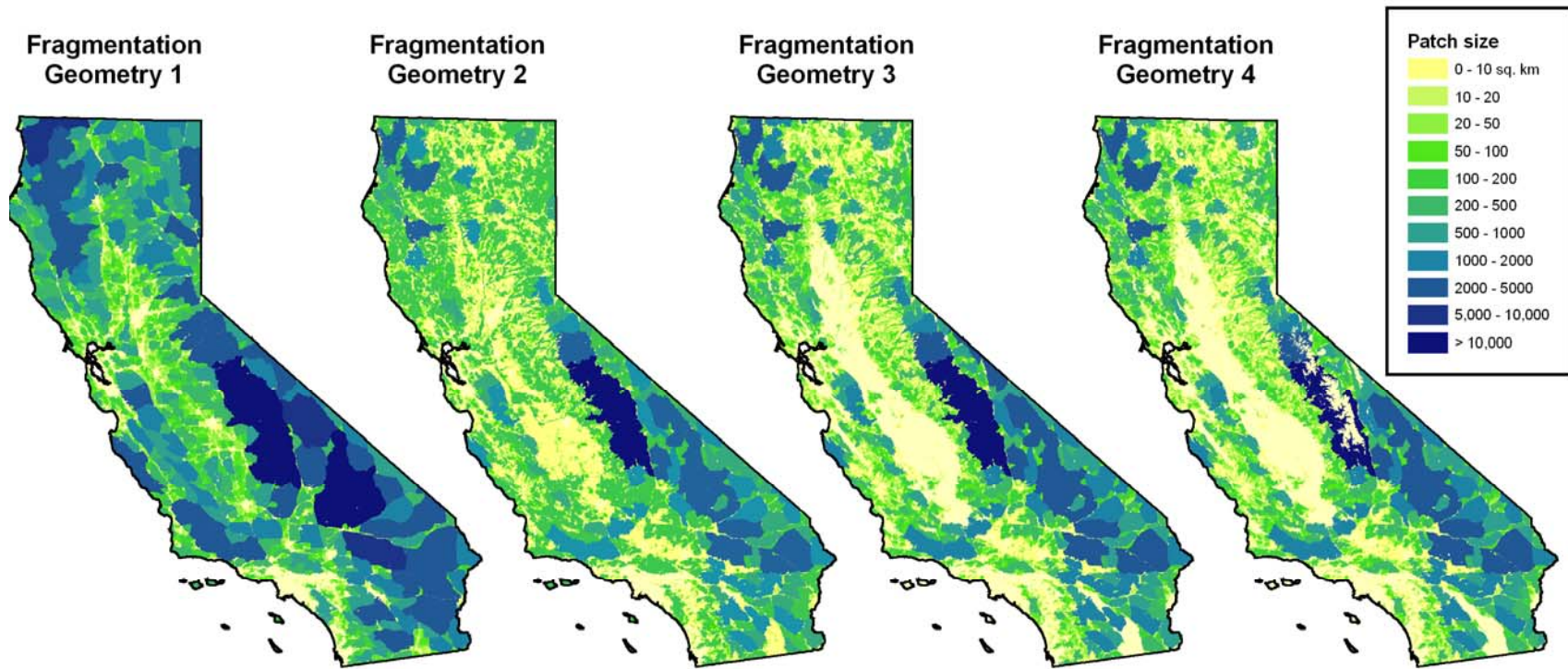


Effective Mesh Size: A Tool for Modeling and Management

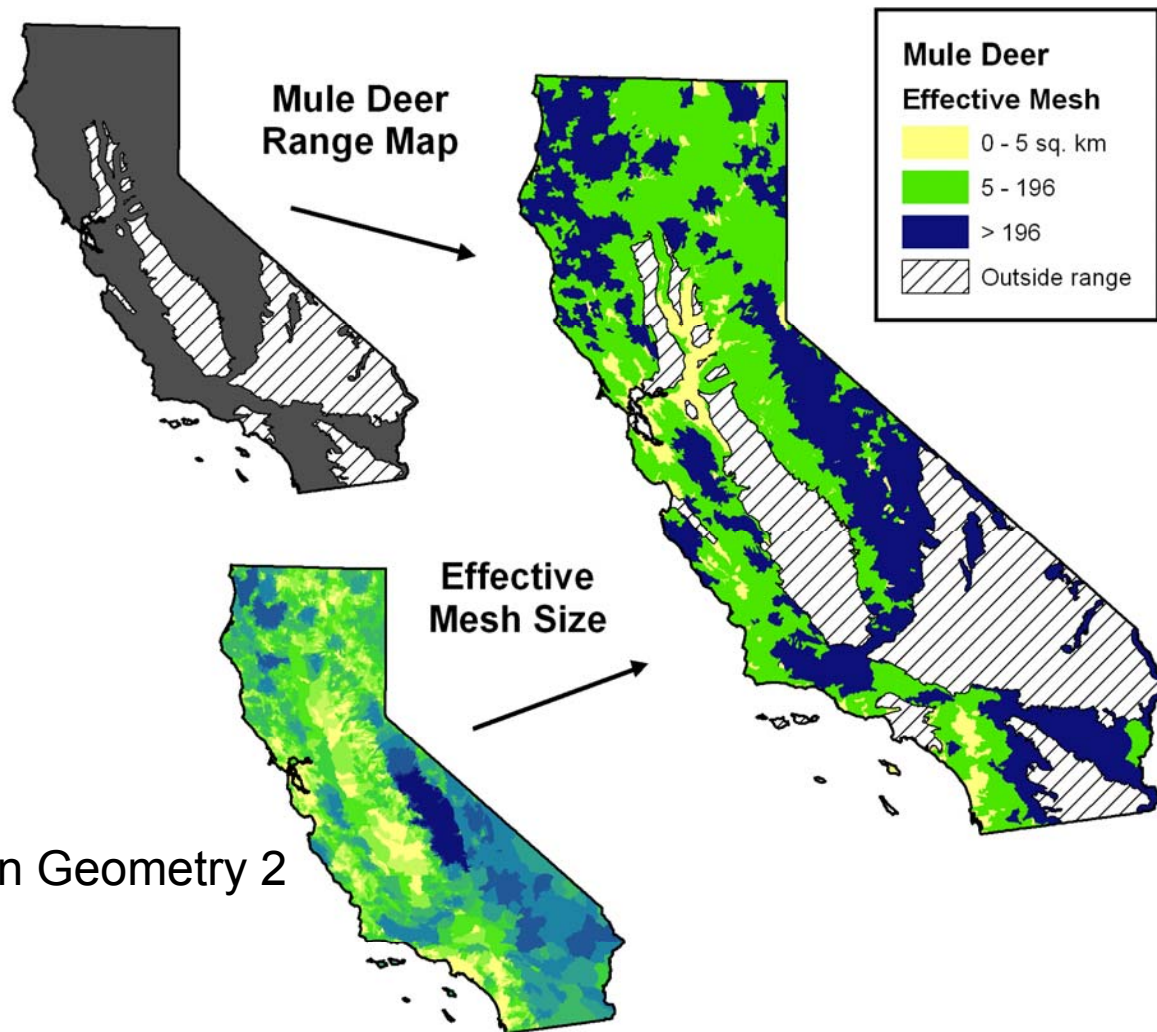
Jochen Jaeger
Evan Girvetz
Jim Thorne
Alison Berry

Concordia University, Montreal
UC Davis ecology graduate student
UC Davis-ICE postdoctoral associate
Road Ecology Center

EMS: Fragmentation factors → patch sizes

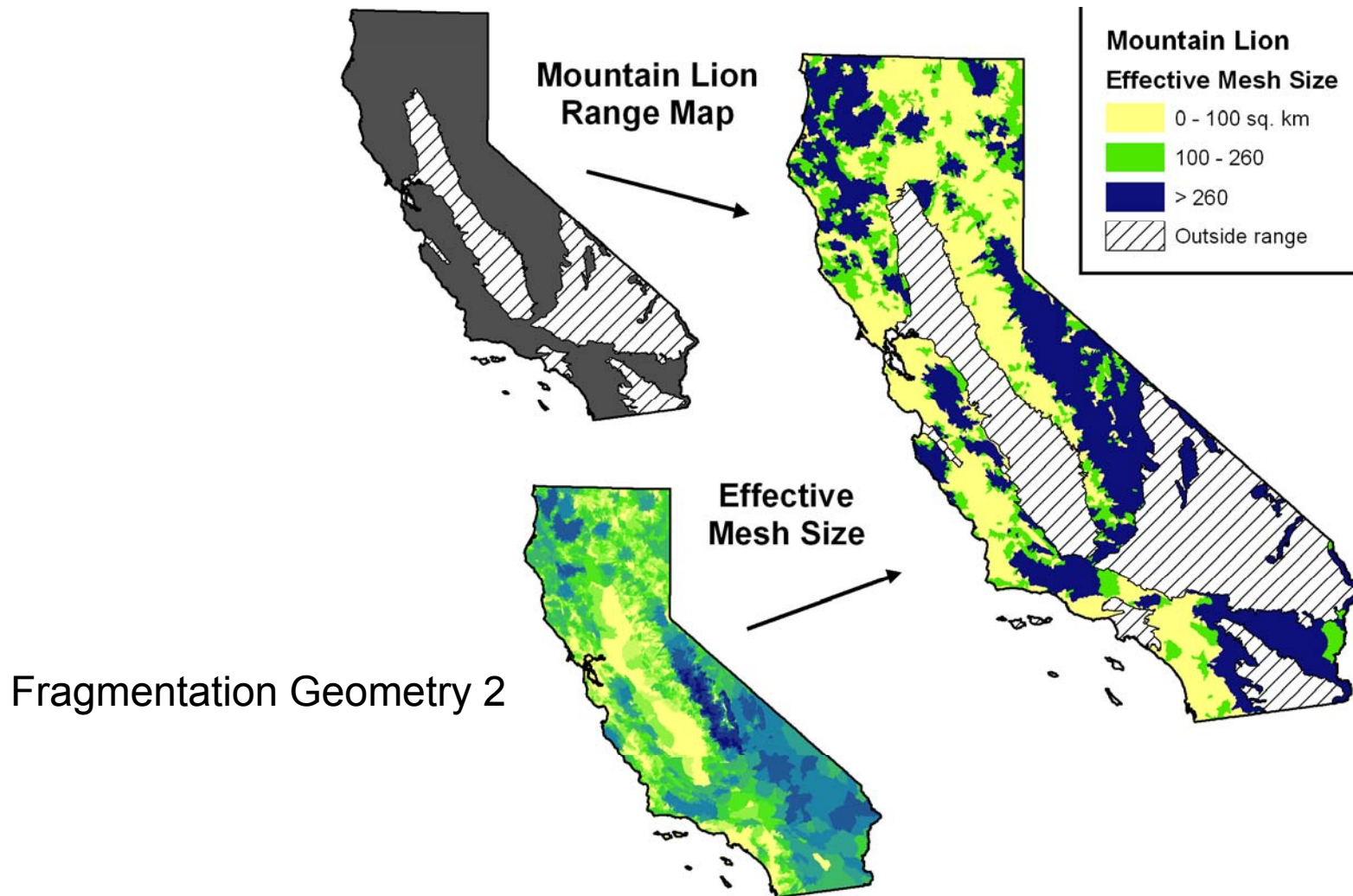


Mule Deer Range (predicted): EMS comparison shows that most of the range has adequate daily connectivity (>5 km²)



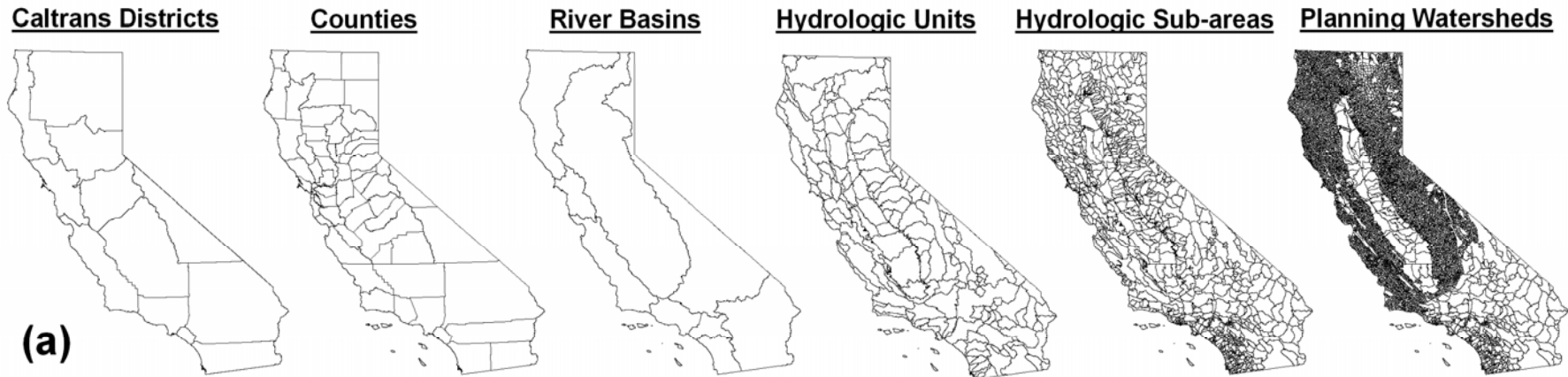
Fragmentation Geometry 2

Mountain Lion: range similar to mule deer; but EMS comparison shows that daily encounters with roads are likely occur over more than 50% of the range (EMS < 100 km²).



Fragmentation Geometry 2

Effective Mesh Size: Conclusions

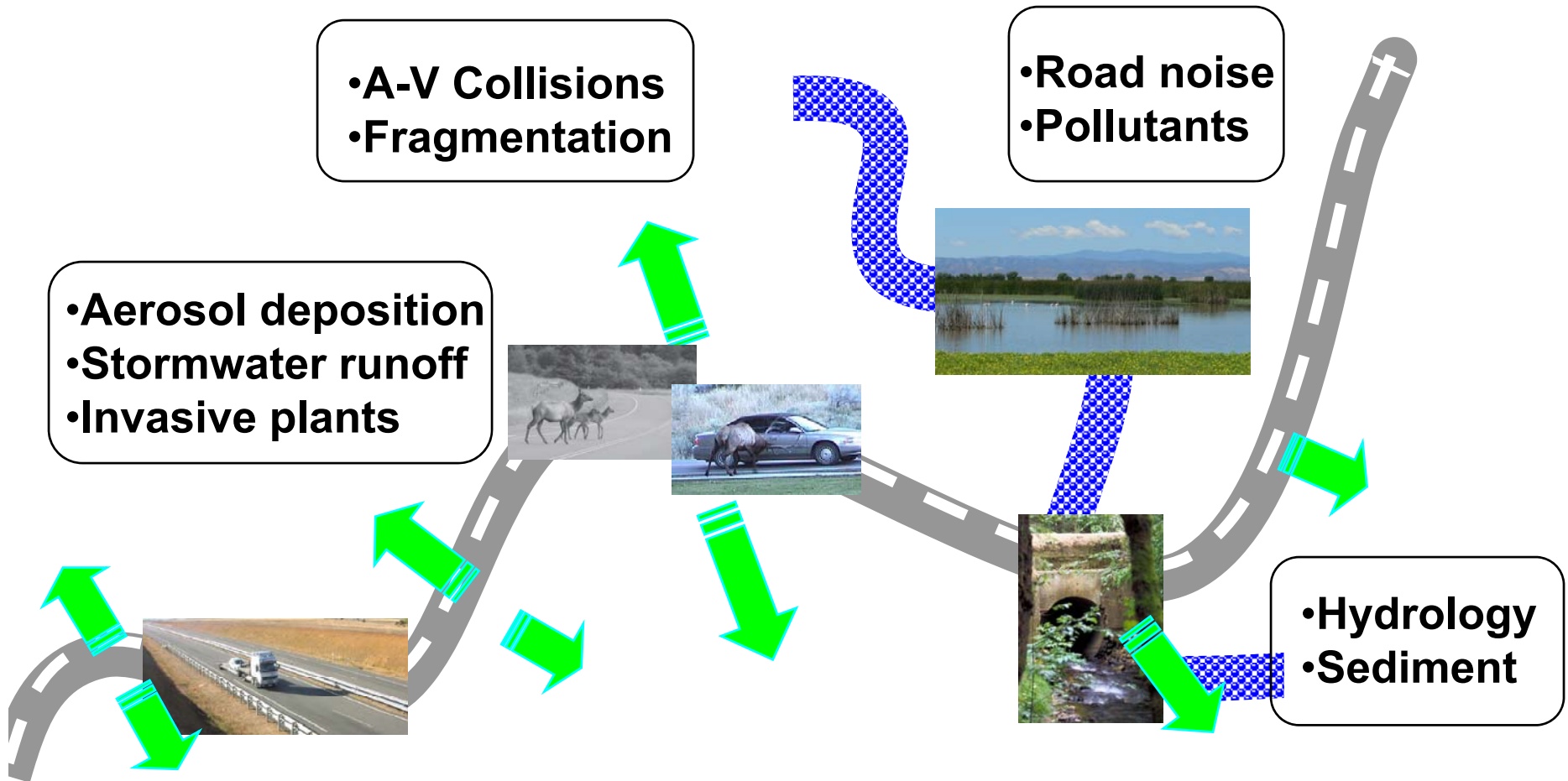


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- Roads are the key factors in landscape fragmentation.
 - EMS provides a uniform, scaleable metric for planning that can be used by different agencies and administrative units.
 - EMS can be used to help decide
 - Where to place roads for ecological preservation.
 - What the limits on road network density should be.
 - EMS does NOT give information on wildlife populations.

II. Road-effect zone

TERRESTRIAL

WETLANDS & WATERSHEDS



Unified Model?

Road Effect Zone

Bringing “gray” and “green” together

A.T.I.R.C.
Advanced Transportation
Infrastructure Research Center

Purpose:

To provide an integrated & longterm experimental framework.

Synergies:

- Pavement Research Center
- Adv. Highway Maintenance & Construction Technologies
- Road Ecology Center

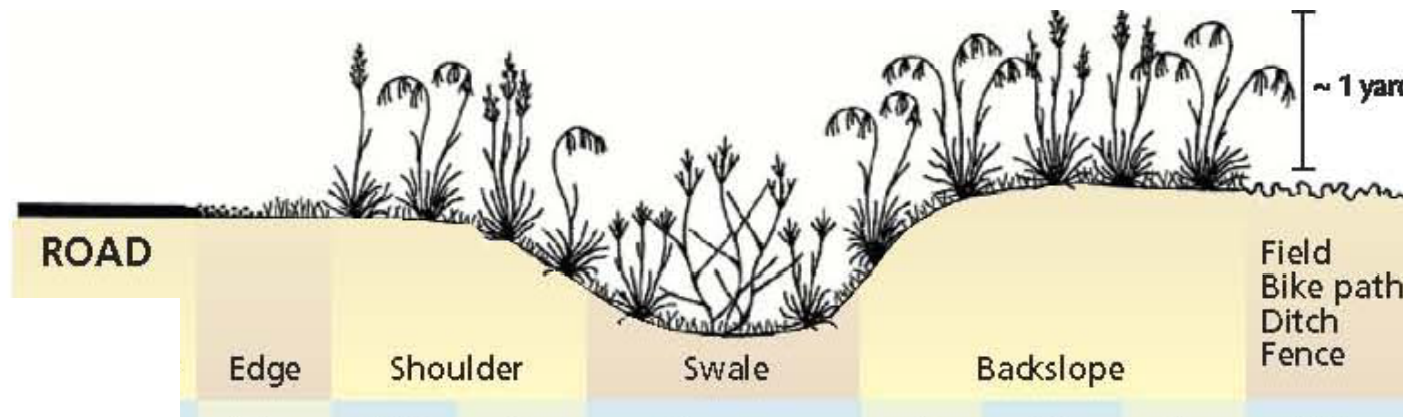
Projected: June, 2008

UC DAVIS
UNIVERSITY OF CALIFORNIA



Vision:

Roadside “Laboratories”/ Sustainable Roadsides



O'Dell et al. 2007

↑Pavement & maintenance

↑Soil & slope management

↑Stormwater runoff

↑Ecological restoration

↑Multiple Uses

FUTURE

Road Systems,
Human Systems
& Ecosystems

III. *Acoustic ecology/road noise* -- facilitating research communication



ATIRC Site Plan

- Pavement test tracks
- Technology infrastructure
- Roadside plots

Experimental Retention Pond

Experimental Retention Pond



Backslope
Swale
Shoulder
Edge

