



Invasive Species

Role of Conservation Districts

MAE NAKAHATA

CENTRAL MAUI SOIL AND WATER CONSERVATION DISTRICTS

Conservation Plans

- Natural Resources
- Special Environmental Concerns
- Economic and social considerations
- NEPA policy issues

Cover Crops

- ▶ Soil Health
- ▶ Beneficial Insects
- ▶ Erosion Control



Angiostrongylus cantonensis

The Semi-slug



Rat Lungworm Disease

Minn. Man Contracts 'Rat Lungworm' Disease In Hawaii

By [John Lauritsen](#) January 20, 2012 at 6:14 am Filed Under: [Disease](#), [Hawaii](#), [John Lauritsen](#), [Minnesota](#), [Paralyzed](#), [Paralyzing](#), [Rat Lungworm](#), [Watertown](#)

WATERTOWN (WCCO) — People travel to Hawaii to relax and get some sun and surf, but a Minnesota man's trip to paradise turned into a nightmare after he contracted a paralyzing disease.

Eric Reinert is 22 years old and learning to walk all over again.

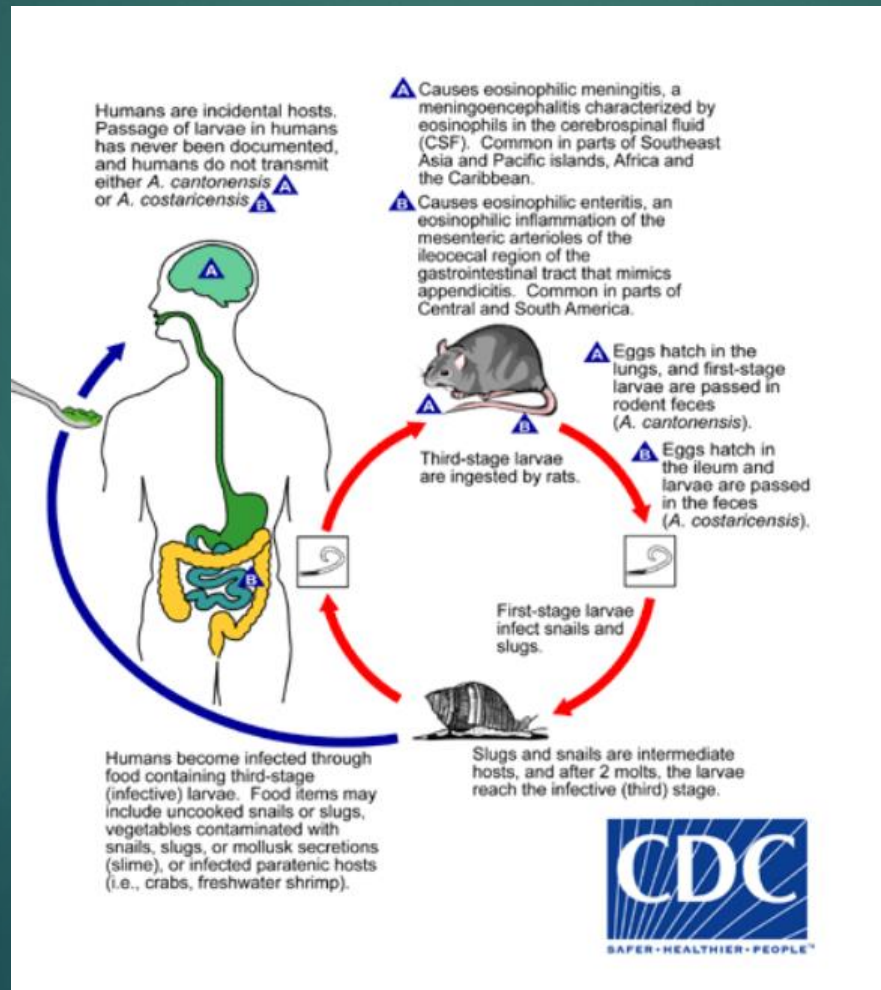
He's taking baby steps and it can be hard to keep his balance, but they are a long way from where he was just a month ago.

He was stuck in a wheelchair in a Hawaiian hospital all because of a microscopic parasite.

Big Island infant diagnosed with rat lungworm disease



Rat Lungworm Life Cycle



Linkage to agricultural production

Rat lungworm infection linked to raw vegetables in continental US

Liu EW, et al. *MMWR Morb Mortal Wkly Rep.* 2018;doi:10.15585/mmwr.mm6730a4.

August 4, 2018



ADD TOPIC TO EMAIL ALERTS



Eugene W. Liu

Twelve cases of human infection with *Angiostrongylus cantonensis*, otherwise known as rat lungworm, have been identified in the continental United States, with possible sources including raw vegetables from local gardens, according to study results from the CDC.

“Ingestion of snails or slugs containing rat lungworm (*A. cantonensis*)

Sixteen patients (median age, 20 years; 10 men) from eight states in the continental U.S. (California, Texas, Utah, Colorado, Arizona, Alabama, Tennessee and New York)

Moist habitats .. Cover crops Slug Haven



"When researchers experimented with various sacrificial methods to lure pests away from valuable plants, red clover proved best.

Slugs love red clover. Ornamental gardeners regard it as weed and try and eradicate it from their lawns!

Farmers and veggie growers recognise its nitrogen fixing properties as a legume and grow it as a cover or fallow crop.

Easy to grow, red clover is a hardy, but short-lived perennial which often propagates itself by seeds. Plant a strip of beautiful red clover near your garden to lure the slugs away. Makes great nitrogen-rich organic matter as it fades, and you can let another fresh crop grow nearby.

Slugs and snails ..no longer a nuisance but a health threat

- ▶ No tolerance slug/snails for food crops
- ▶ Food vendors demand evidence of management

Unintended Consequences

Glycine – NRCS
introduction to
replace massive
pasture grass
dieback



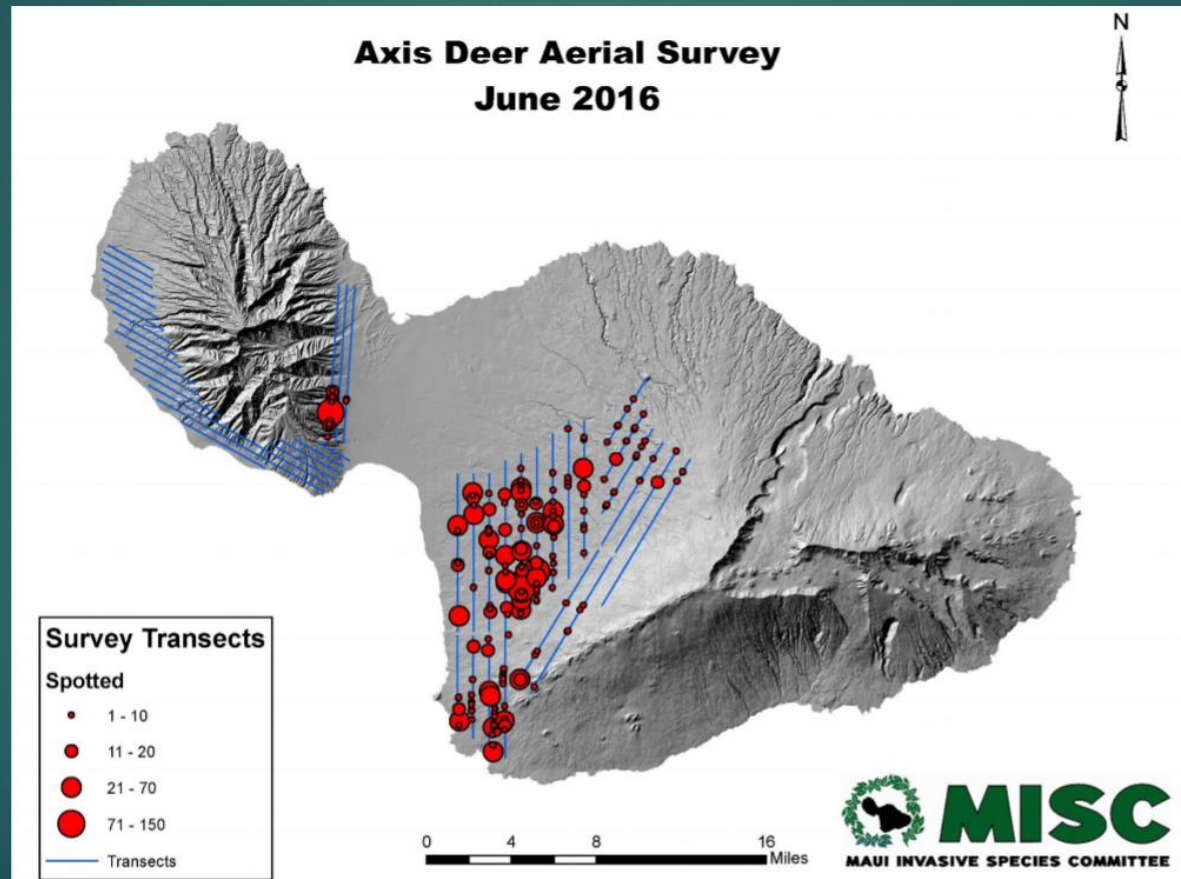
Ungulates – A gift to the King

released on
Maui after
studies
indicated that
it would not
impact native
forests



Axis deer, file photo courtesy The Nature Conservancy and DLNR.

Axis Deer populations Out of control



Pre-entry Precautions

- ▶ Regulated “pests”
- ▶ Unique environs



Managing Invasive
Species is
Everybody's
business

Mahalo