

# Foundations of the Semantic Web: Ontology Engineering

## Building Ontologies 4c

Definitions with additional necessary conditions

Alan Rector

1

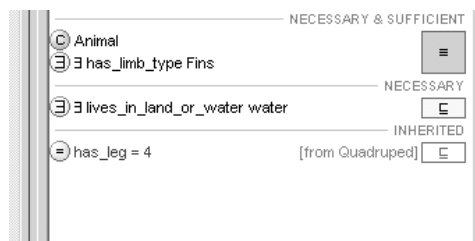
## Defined classes with necessary conditions

- What does it mean to have both kinds of restrictions
  - Necessary and Sufficient
  - Necessary
- `Animal_with_fins` =  
Animal AND has\_limb\_type Fins necessarily  
lives\_in\_land\_or\_water someValuesFrom water

2

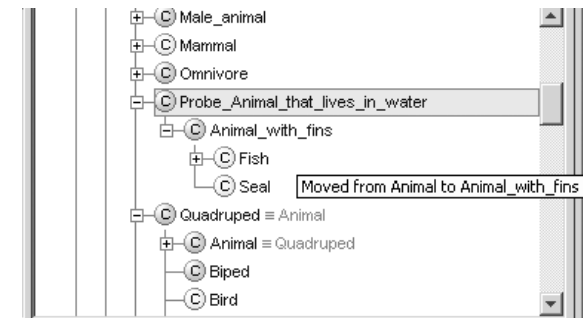
## Defined classes with necessary conditions

- Effectively rules
  - “Any animal with fins lives in some water”



3

## Subsumption means necessary implication



- All animals with fins are animals that live in water

4