

FWC Listing Criteria Training

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original materials prepared by IUCN
Red List Program

Revised January 2011



SPECIES SURVIVAL COMMISSION

Presentation Objective

- This presentation provides training in how to use the listing criteria adopted by the FWC to identify species that have a high risk of extinction. It is shared with Biological Review Groups before they evaluate species in Florida.
- This presentation is fairly detailed and lengthy. More detailed reference materials can be found at

http://www.iucn.org/about/work/programmes/species/red_list/resources/technical_documents/



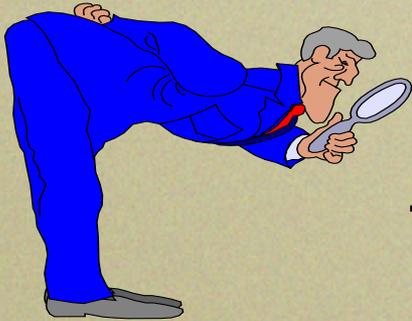
Origin of FWC Listing Criteria

FWC listing criteria and definitions are derived from those developed by IUCN because:

- Developed, tested, and refined by experts over many years
- Objective and quantifiable for wide array of wildlife
- Thousands of taxa now ranked worldwide



State Designated Threatened Species FAC 68A-27.001(3)



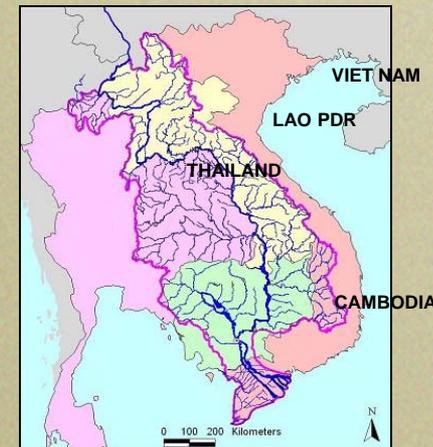
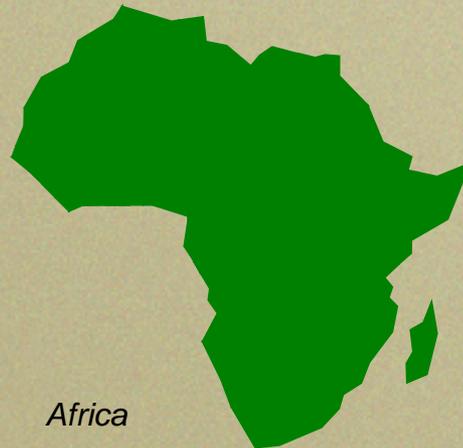
The FWC criteria can be applied to:

- “Fish or wild animal life”, “vertebrate or invertebrate”
- Species
- Subspecies
- Isolated populations
- Native to Florida (pre-European/not human-introduced)



From Global to Regional

- Continents
- Countries
- States
- Provinces
- Biogeographical or ecological areas



*Lower Mekong River
basin area*



Two-Step Process:

Step One

Regional Assessment Using the
Five Listing Criteria

Step Two

Considering Adjustments to the
Regional Assessment



Nature of the Criteria

CRITERIA

FLORIDA STATUS

A Population reduction

B Restricted geographic range

C Small population size & decline

D Very small or restricted population

E Quantitative analysis

Quantitative thresholds

Threatened

Must meet only one criterion



Threatened

A taxon is Threatened in Florida when the best available evidence indicates that it meets any of the criteria A to E for State Threatened, and it is therefore considered to be facing a high risk of extinction in the wild



A Wide Variety of Information Can Be Used



Observed

E

Estimated

P

Projected



Inferred

?

Suspected



Observed information is directly based on well-documented observations of all known individuals in the population.

E.g., counts of nesting pairs of birds; known individual panthers - this quality of data is rarely available for wild animals



Estimated information is based on calculations that may involve assumptions and/or interpolations in time.

E.g., population estimates based on mark/recapture techniques (Lincoln-Petersen, Jolly-Seber)



Projected information is the same as “estimated”, but the variable of interest is extrapolated in time towards the future.



Inferred information is based on variables that are indirectly related to the variable of interest, but in the same general type of units (e.g., number of individuals or area or number of subpopulations).



Examples of Inferred Data

(all involve making assumptions)

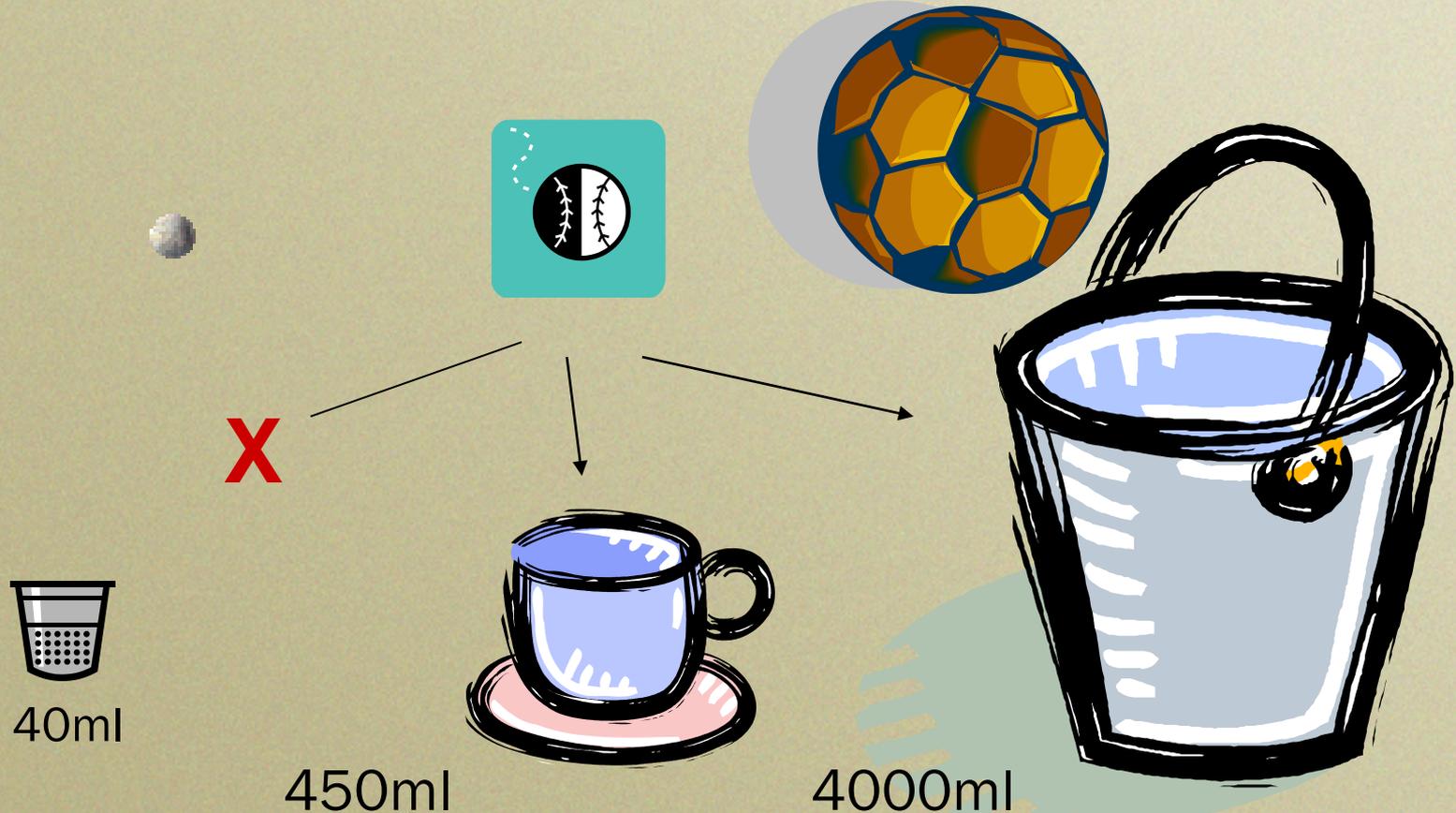
- Alligator eyeshine counts
- Deer / turkey track counts
- Gopher burrow counts
- Changes in catch per unit effort (CPUE)
- Increased nuisance reports



Suspected information is based on circumstantial evidence, or on variables in different types of units. In general, this can be based on any factor related to population abundance or distribution.



Precise Thresholds DO NOT Require Precise Data



What is the volume of a baseball???



Terminology

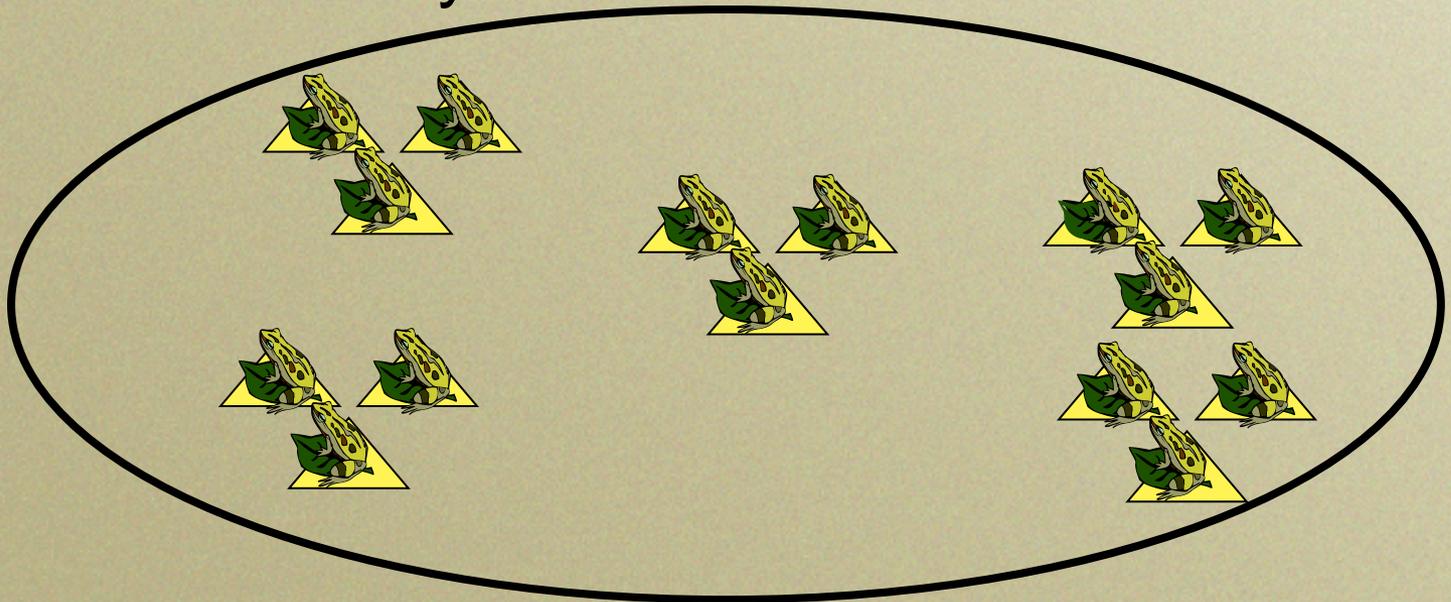
Some listing process-specific terms need to be defined; familiar terms like “population” and “location” have special meanings in this context



Population and Population Size

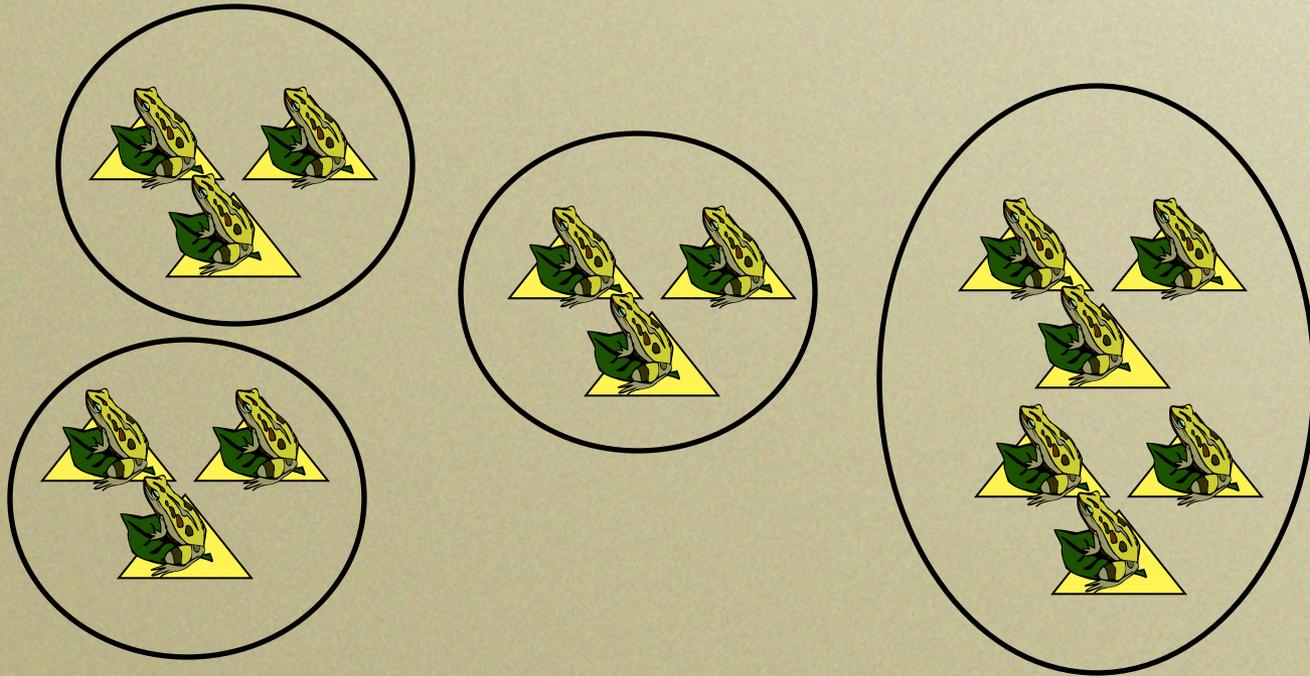
Population is the total number of individuals of a given taxon. (Note, this is different from the usual biological definition of a population.)

Population size is measured as the number of mature individuals only.



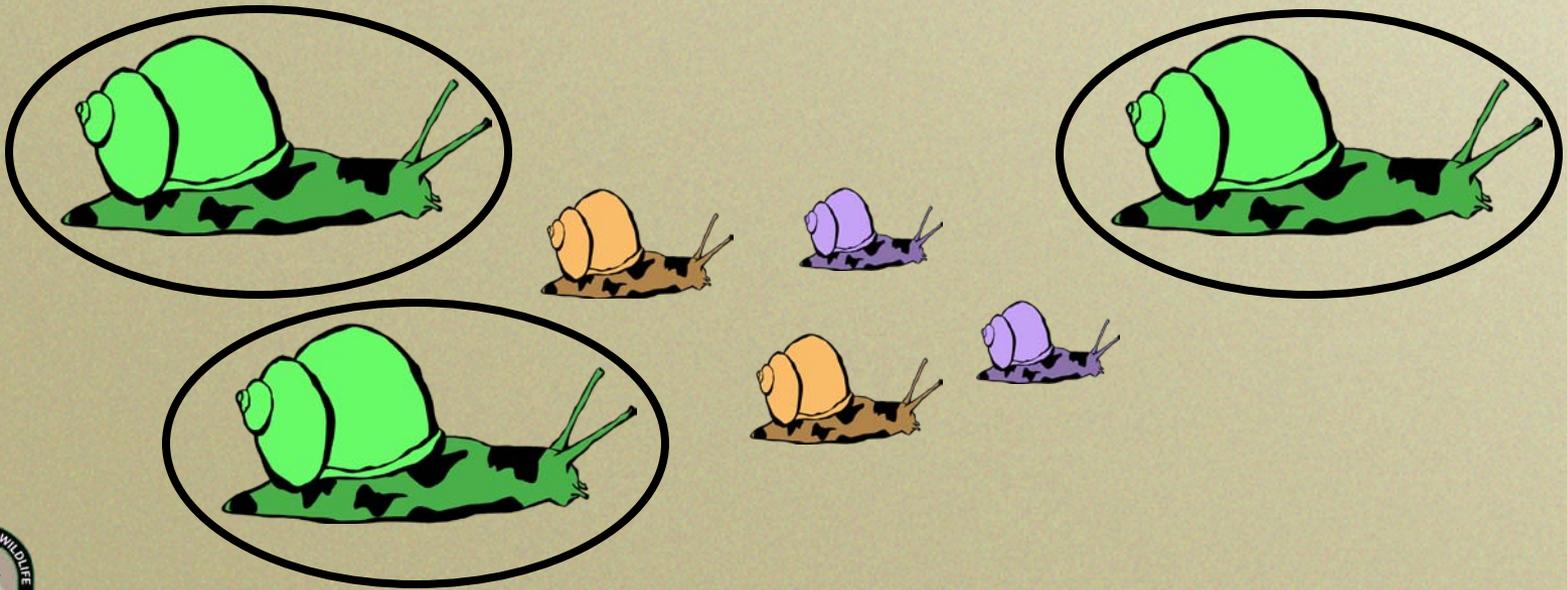
Subpopulations

are geographically or otherwise distinct groups in the population between which there is little demographic exchange (i.e., what most of us call a population)



Mature Individuals

are individuals that are known, estimated or inferred to be capable of reproduction.



Generation Length

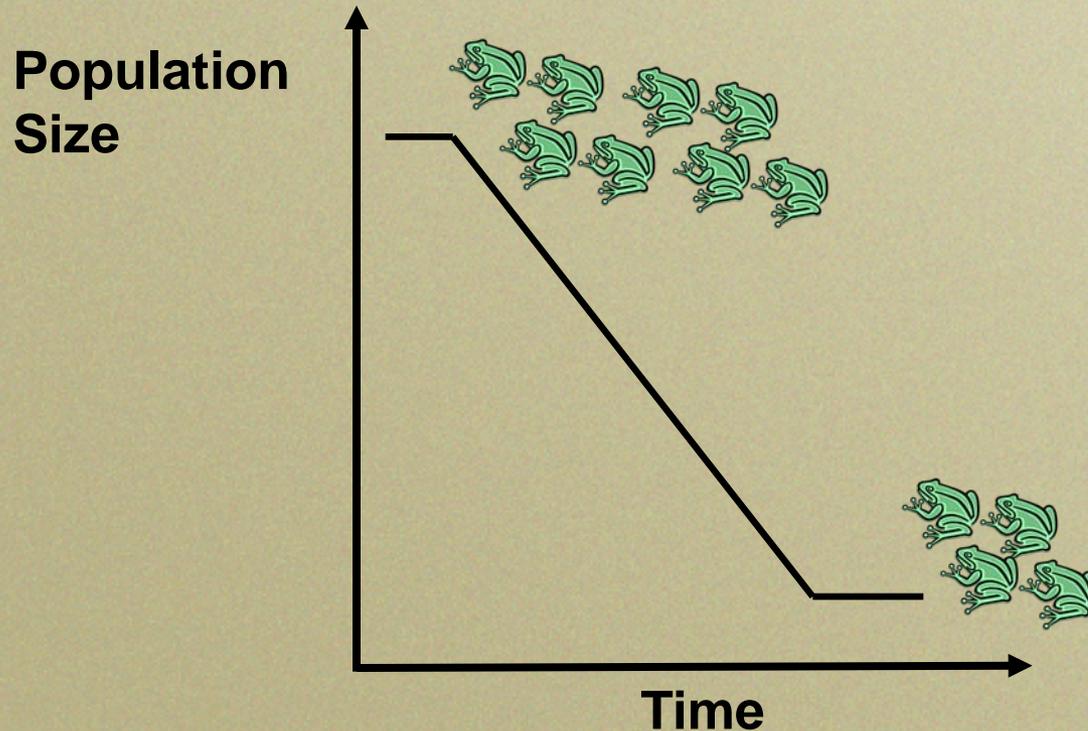
average age of parents of the current cohort

- Greater than the age at first breeding and less than the oldest breeding individual, except in taxa that breed only once.
- Scales all time-based measurements in the criteria to account for different rates at which taxa survive and reproduce.
- Time window of interest is 10 years or 3 generations, whichever is longer



Population Reduction

a decline in population size of at least the percentage stated over the specified time period.



Population Reduction

can be based on rate of habitat loss,
BUT:

- the habitat-species relationship should be well documented;
- assumptions should be based on a good understanding of the taxon, its relationship with the habitat, and good knowledge of threats to the habitat.



Continuing Decline

A recent, current or projected future decline which is liable to continue unless remedial measures are taken.

- May be smooth, irregular or sporadic decline.
- Fluctuations do not qualify as continuing decline.



Severely Fragmented

Refers to the situation in which increased extinction risks to the taxon result from the fact that most of its individuals are found in relatively isolated subpopulations.



Extent of Occurrence

the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all known, inferred, or projected sites presently occupied by the taxon.

Minimum
Convex
Polygon
all internal
angles are
 $\leq 180^\circ$



Area of Occupancy

The area within the extent of occurrence which is actually occupied by the taxon.

- A taxon will not usually occur throughout the area of its extent of occurrence.
- Excludes areas of unsuitable or unoccupied habitats.

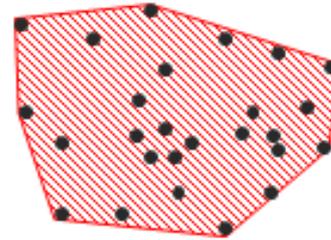


Extent of Occurrence

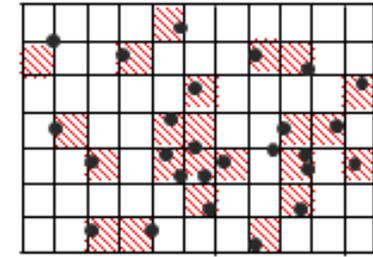
Area of Occupancy



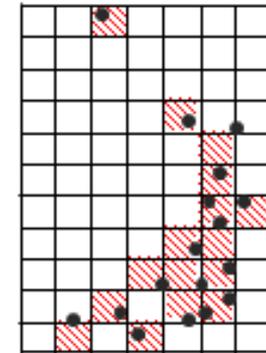
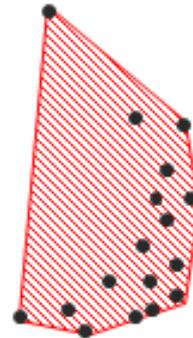
Spatial
distribution of two
taxa (X and Y)



Possible boundary of
Extent of Occurrence



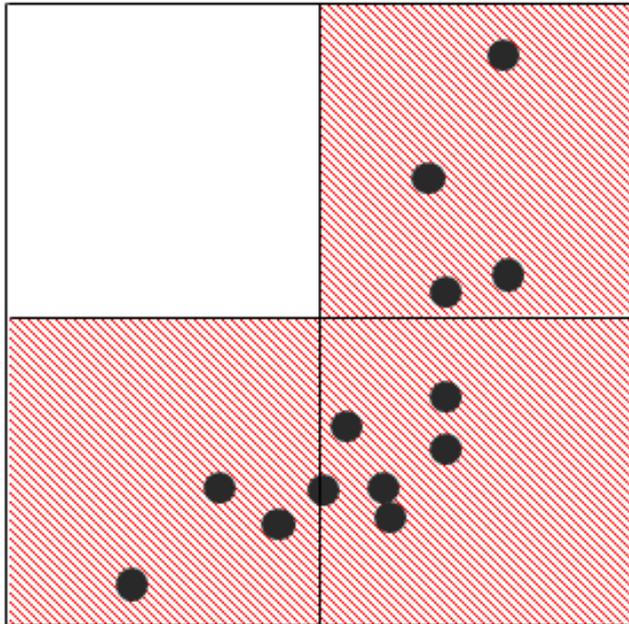
Actual Area of Occupancy.
AOO = number of
occupied cells x area of an
individual cell



Area of Occupancy

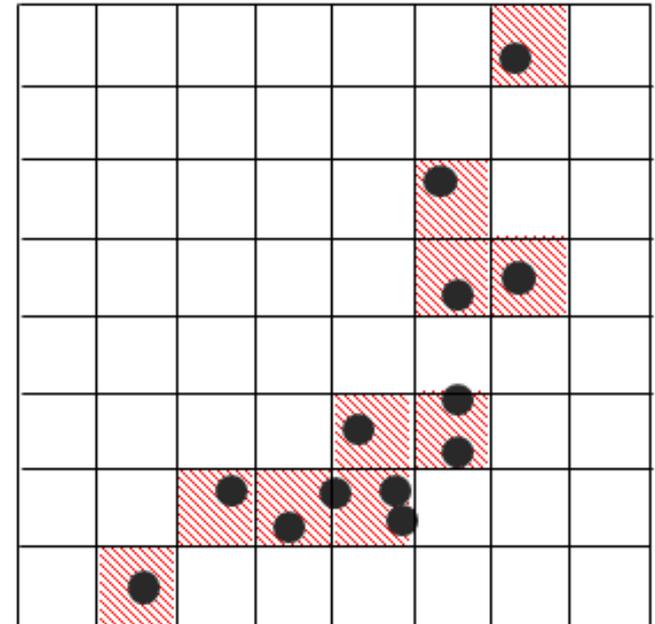
Problems of Scale

Grid Cells 16 units²



$$AOO = 3 \times 16 = 48 \text{ units}^2$$

Grid Cell = 1 unit²



$$AOO = 10 \times 1 = 10 \text{ units}^2$$



Location

a geographically or ecologically distinct area in which a single threatening event can rapidly affect all individuals of the taxon.

- Location size depends on the area covered by a single threatening event.
- May include part of one or many subpopulations.
- Where a taxon is affected by more than one threatening event, location should be defined by the most serious plausible threat.



Part One Recap

- FWC's listing criteria originated from IUCN.
- Considering a taxon's status in Florida involves two steps – a regional assessment, followed by an adjustment to accommodate movement
- Various kinds of data can be used.
- There are new terms, and old terms with new definitions, that are used in assessing taxa against the criteria.



Step One

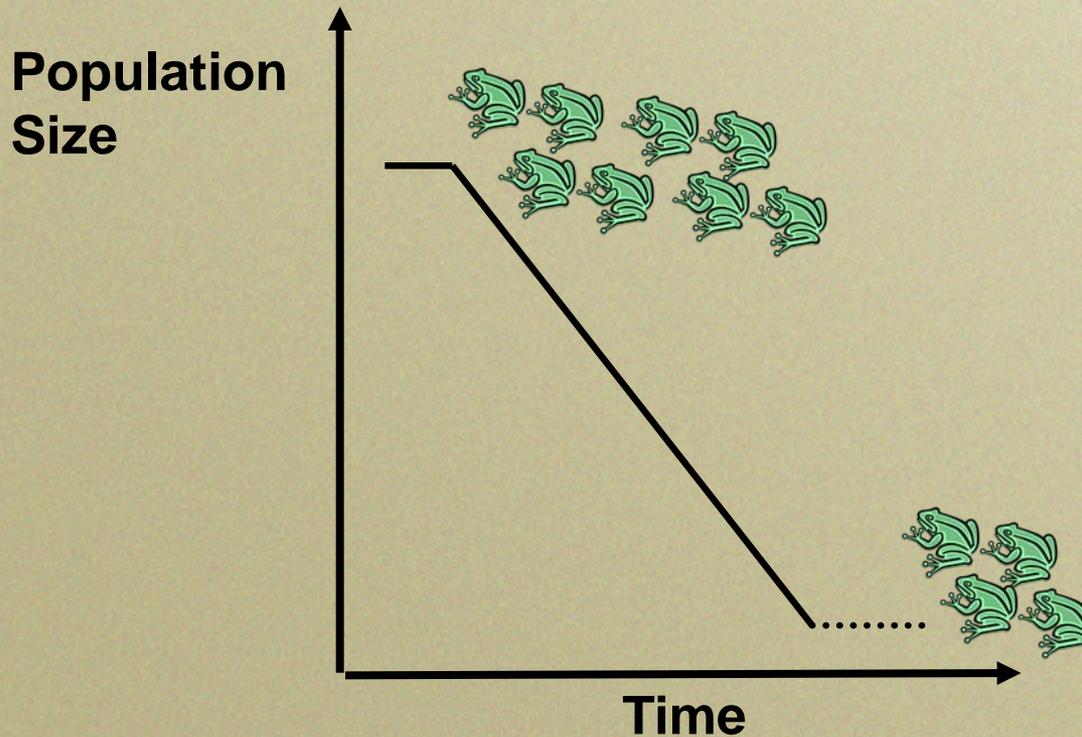
Regional Assessment Using the Five Listing Criteria

CRITERIA



Criterion A

Past, Present or Future Population Reduction



Criterion A

Based on any of four sub-criteria:

A1: Population reduction in **past** and **causes of decline now ceased**

A2: Population reduction in **past** and **causes of decline ongoing**

A3: Population reduction expected in **future**

A4: Population reduction in **past AND future**



Sub-criterion A1



Observed

E

Estimated



Inferred

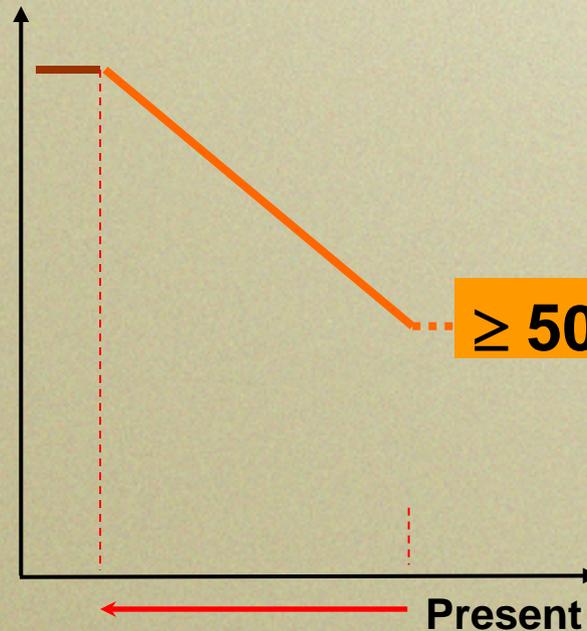


Suspected

population size reduction of:

Where the causes of decline are:

- clearly reversible, AND
- understood, AND
- have ceased



Sub-criterion A2, 3, 4



Observed



Estimated

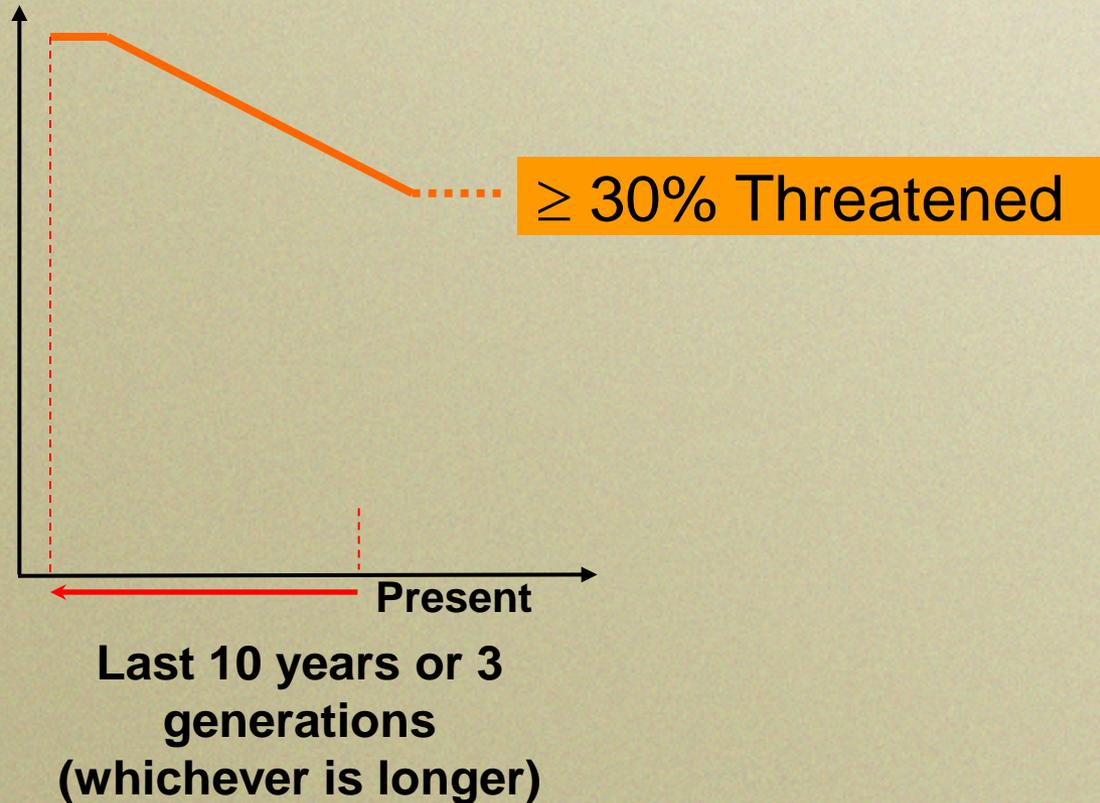


Inferred



Suspected

population size reduction of:



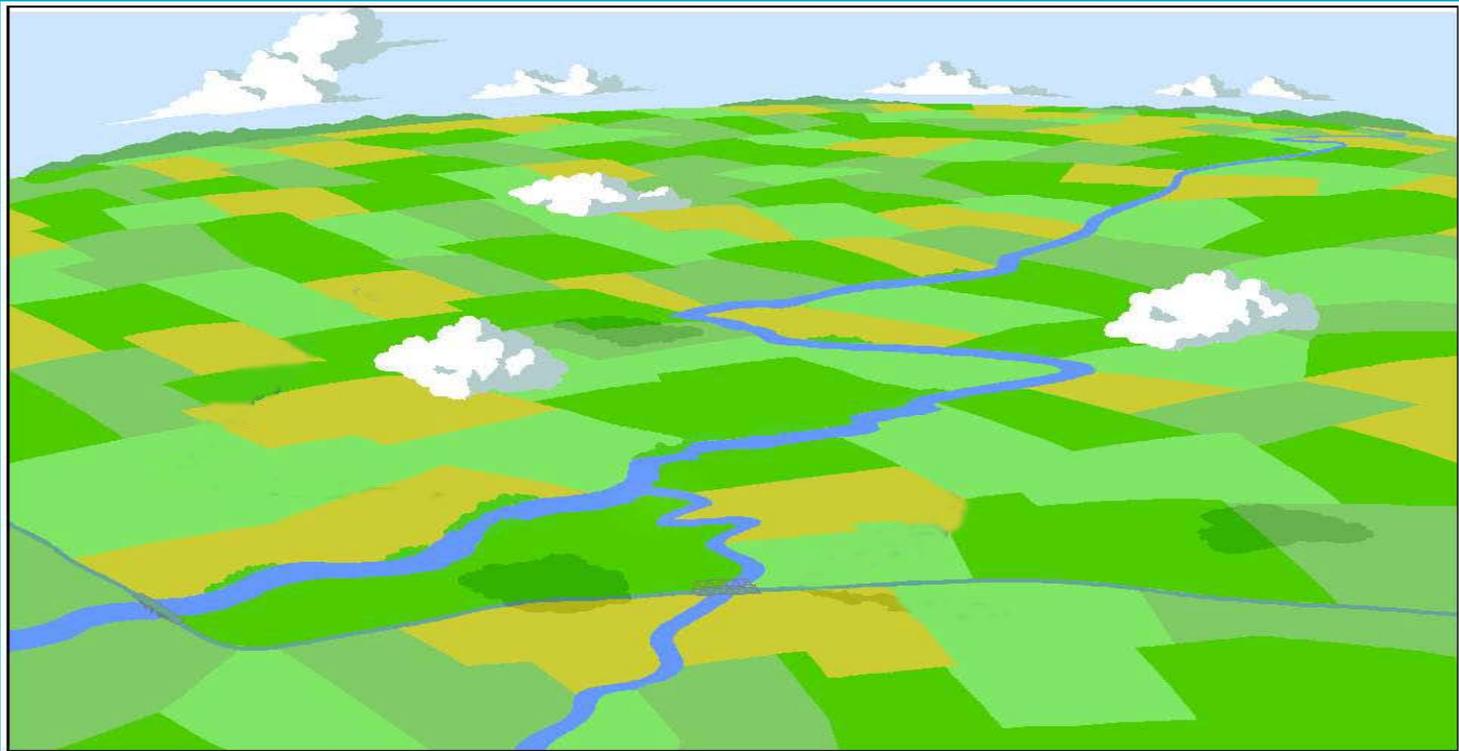
Where the causes of decline may not:

- be reversible, OR
- be understood, OR
- have ceased



Criterion B

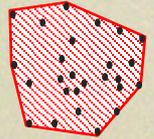
Restricted Geographic Range and Fragmentation,
Continuing Decline or Extreme Fluctuations



Criterion B

Based on either of two sub-criteria:

B1: Estimated extent of occurrence



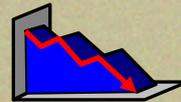
B2: Estimated area of occupancy

AND at least **TWO** of a-c:

a. Severely fragmented or few locations.



b. Continuing decline.



c. Extreme fluctuations.

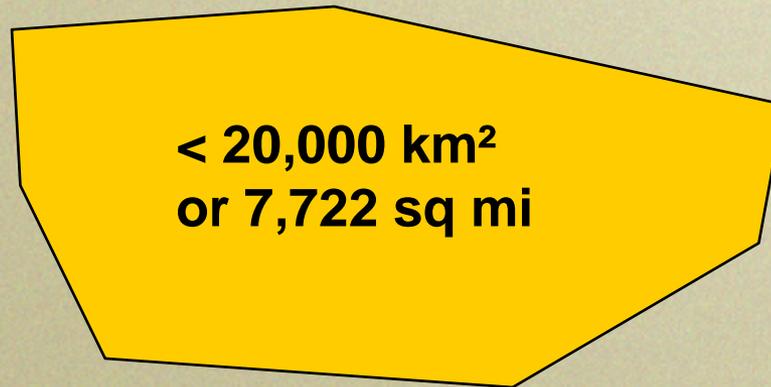


Criterion B

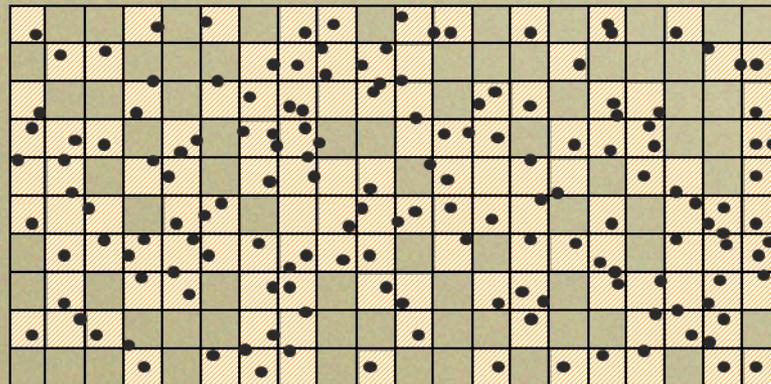


Sub-criteria B1 and B2

B1: Extent of occurrence estimated to be:



B2: Area of occupancy estimated to be:



< 2,000 km² or 772 sq mi

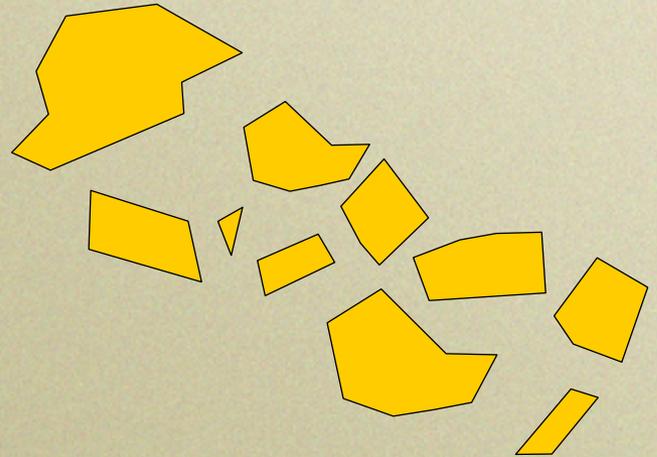


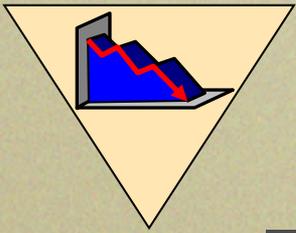
B1 and/or B2 **AND** at least **TWO** of
a, b or c...

a. Severely fragmented :

OR

Occurs at fewer
than 10 locations
(threat areas)





B1 and/or B2 **AND** at least **TWO** of a, b or c...

b.



observed



inferred

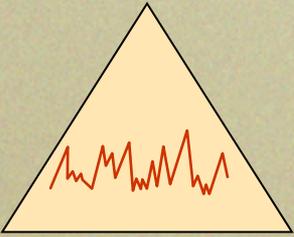


projected

continuing decline in any of:

- (i) extent of occurrence
- (ii) area of occupancy
- (iii) area, extent and/or quality of habitat
- (iv) number of locations or subpopulations
- (v) number of mature individuals





B1 and/or B2 **AND** at least **TWO** of **a, b or c...**

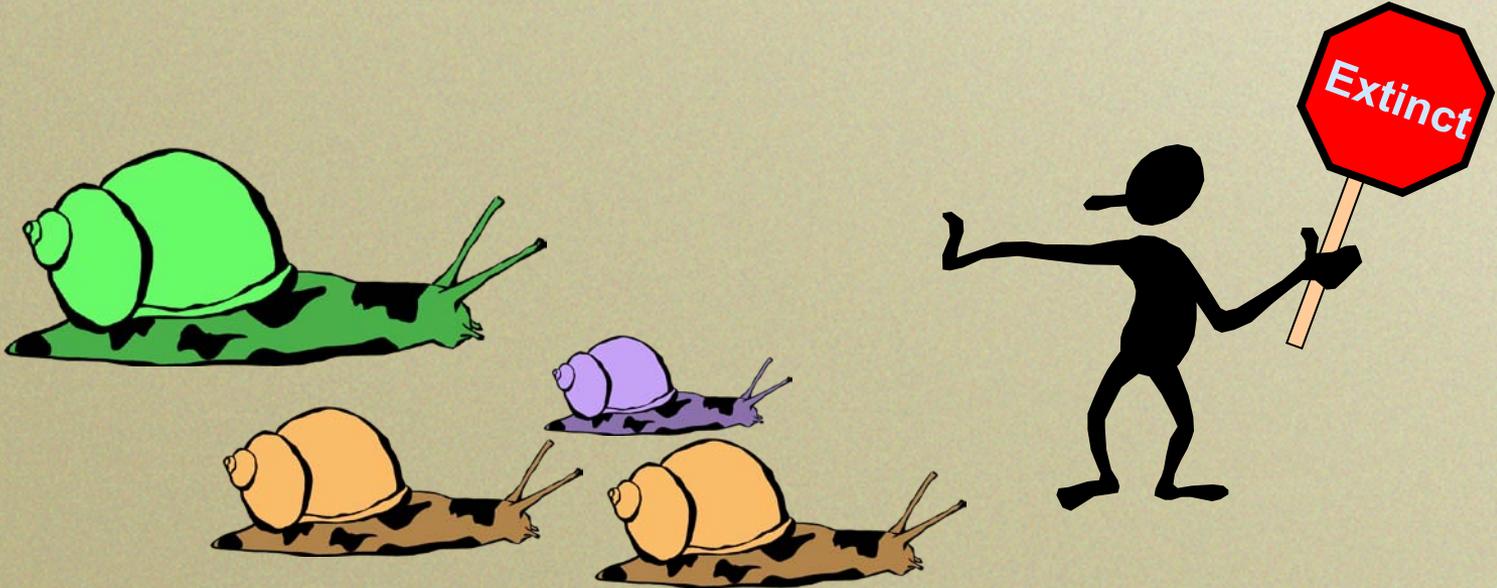
c. Extreme fluctuations in any of:

- (i) extent of occurrence
- (ii) area of occupancy
- (iii) number of locations or subpopulations
- (iv) number of mature individuals



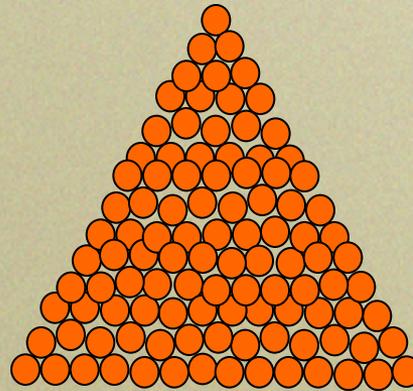
Criterion C

Small population size and
continuing decline



Criterion C

Based on population size of:



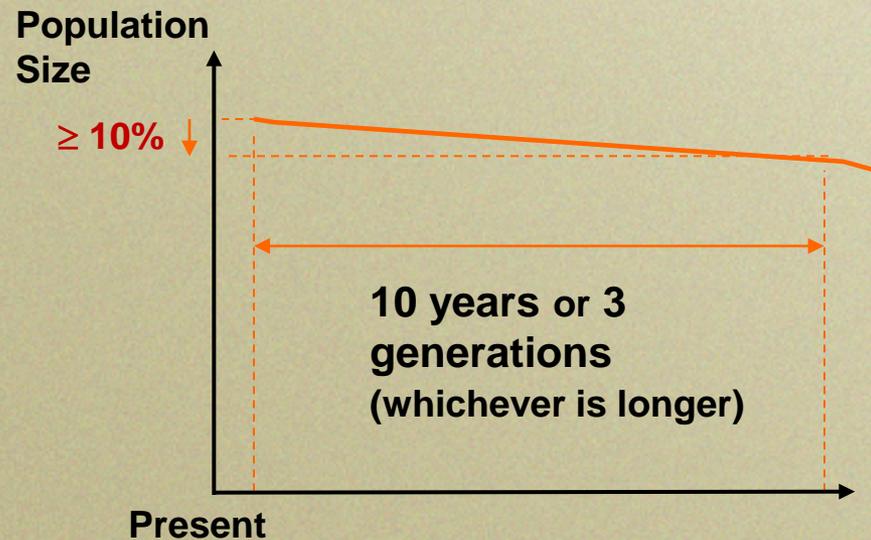
< 10,000
mature individuals

AND either sub-criteria C1 or C2...



Sub-criterion C1

Estimated **continuing decline** of at least:



$\geq 10\%$ within 10 years
or 3 generations

Up to a maximum of 100 years in the future



Sub-criterion C2



Observed

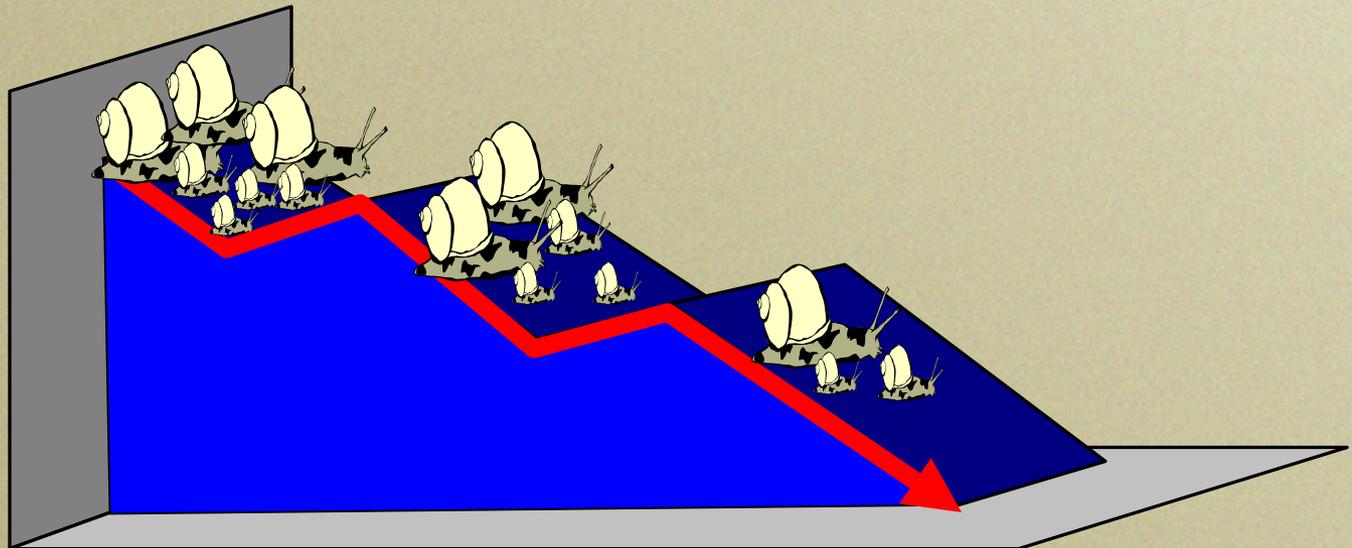


Projected



Inferred

continuing decline in numbers of mature individuals **AND** at **least one of a or b ...**

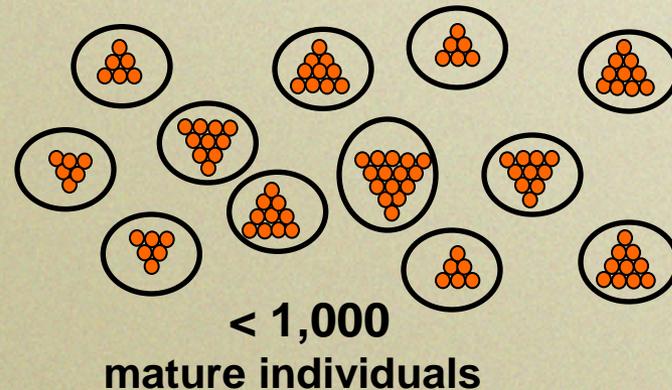


Sub-criterion C2

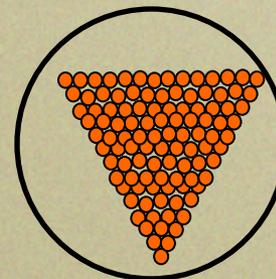
Continuing decline in numbers of mature individuals **AND** at least one of a or b ...

a. Population structure in form of one of the following:

(i) **All** subpopulations have:



(ii) **One** subpopulation has:



Sub-criterion C2

Continuing decline in numbers of mature individuals **AND** at least one of a or b ...

b. Extreme fluctuations in the number of mature individuals



Criterion C

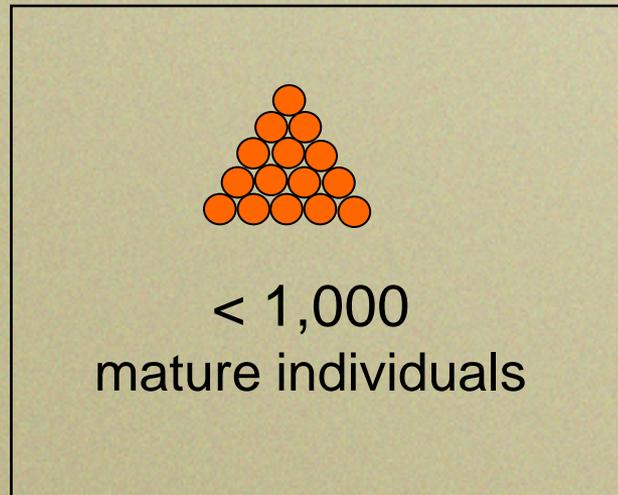
Points to remember:

- The taxon must meet the population size threshold (< 10,000) **BEFORE** meeting the thresholds for sub-criteria C1 or C2.
- Sub-criterion C1 is based on **continuing decline of \geq 10%** within 10 years or 3 generations.
- Sub-criterion C2 is based on **continuing decline at any rate**, but the taxon **must also** meet the requirements for **population structure (C2a) or extreme fluctuations (C2b)**.



Criterion D

Based on population size of:



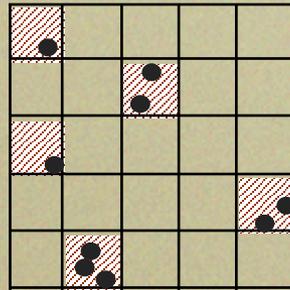
OR

Sub-criterion D1



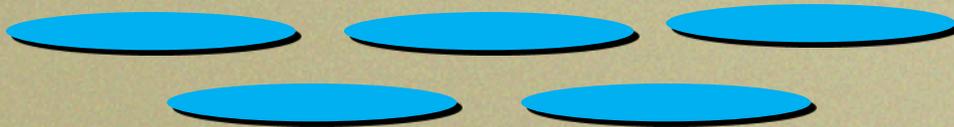
Sub-criterion D2

Population has a very restricted area of occupancy:



typically $< 20 \text{ km}^2$
or 8 sq mi

OR a very restricted number of locations:

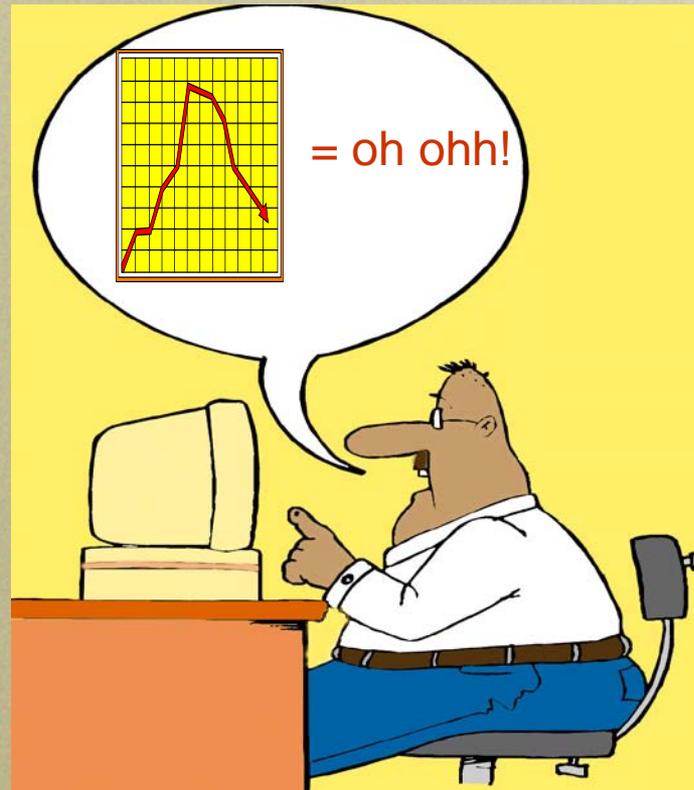


typically ≤ 5



Criterion E

Quantitative analysis
P extinct 100 years $\geq 10\%$

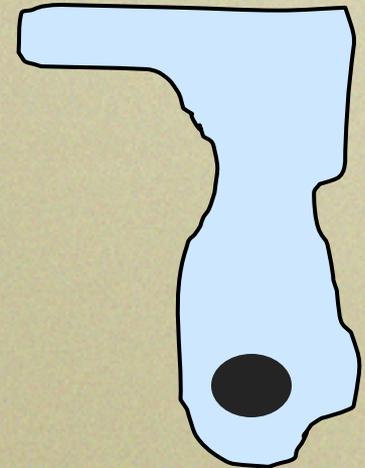


Step Two

Considering Adjustments to the Regional Assessment

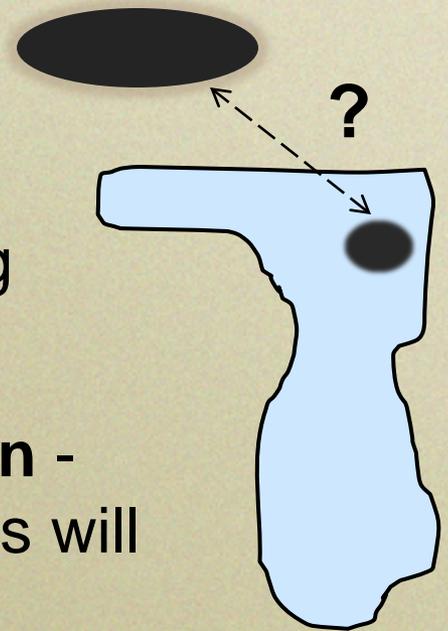
- **Endemic taxa** - No extra-regional populations to influence the regional assessment. The Categories and Criteria alone can be used.

Regional assessment = Global assessment



Considering Adjustments to Regional Assessment

- **Non-endemic taxa** - may be influenced by populations outside the region:
 - **Isolated populations** - Behave as endemics. These can be assessed using the Categories and Criteria alone.
 - **Migration to or from outside the region** - Movement of individuals between regions will influence the risk of extinction within the region. The Categories and Criteria alone **may produce a wrong categorization** for these populations.



Regional Criteria Assessment Flow Chart



Breeding

Non-breeding

QUESTIONS?

