



# Pathway Analysis for the Gulf and South Atlantic States

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USGS

Nonindigenous Aquatic Species Program

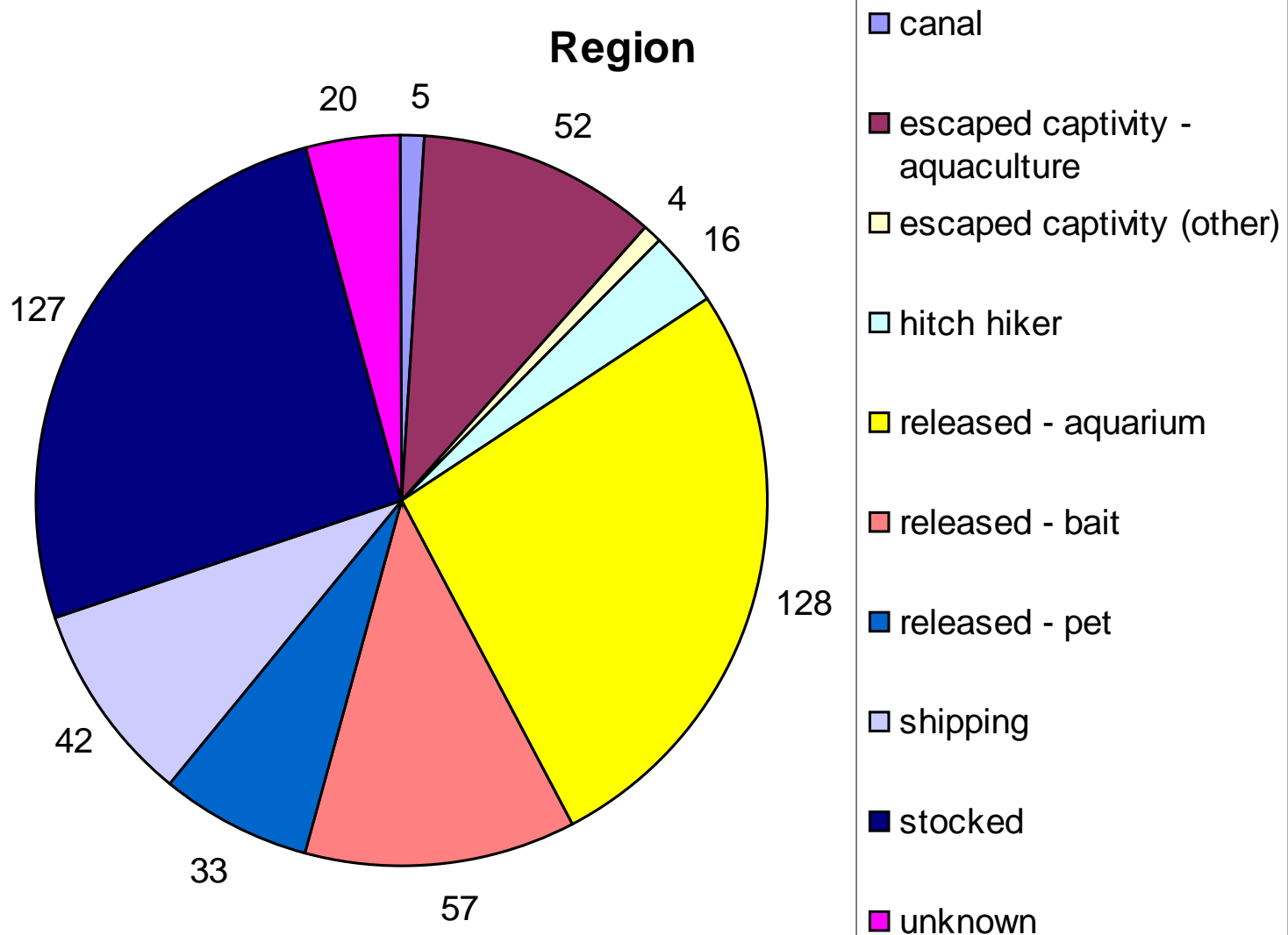
July 26, 2005

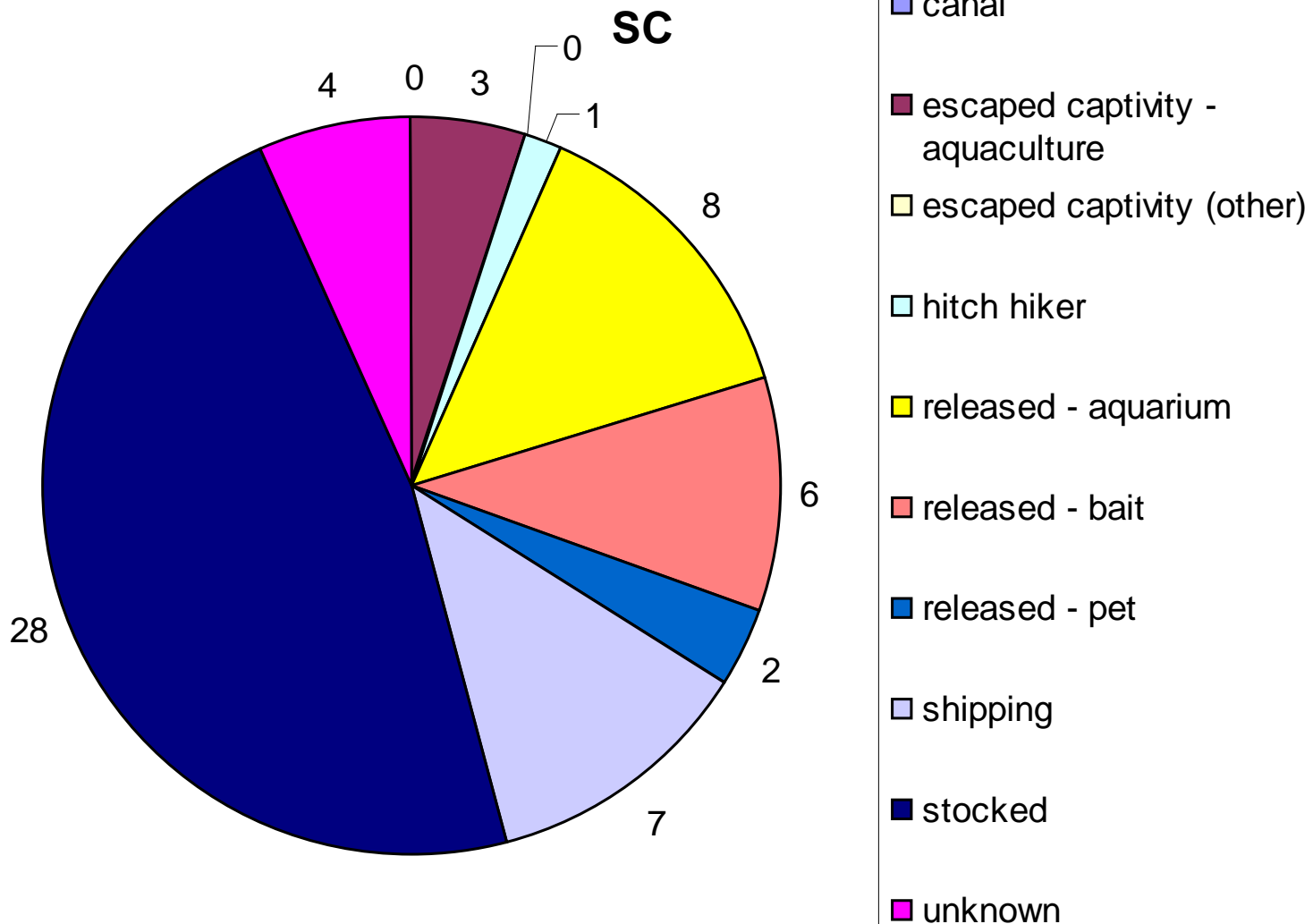
# Explanation of data

- All data are based on data entered into the USGS/NAS database as of 7/25/05.
- A single species may be counted in multiple pathways.
- Data is based on the best available information. Sometimes that means educated guesses about a species.
- Data includes species that did not persist (including single individuals).

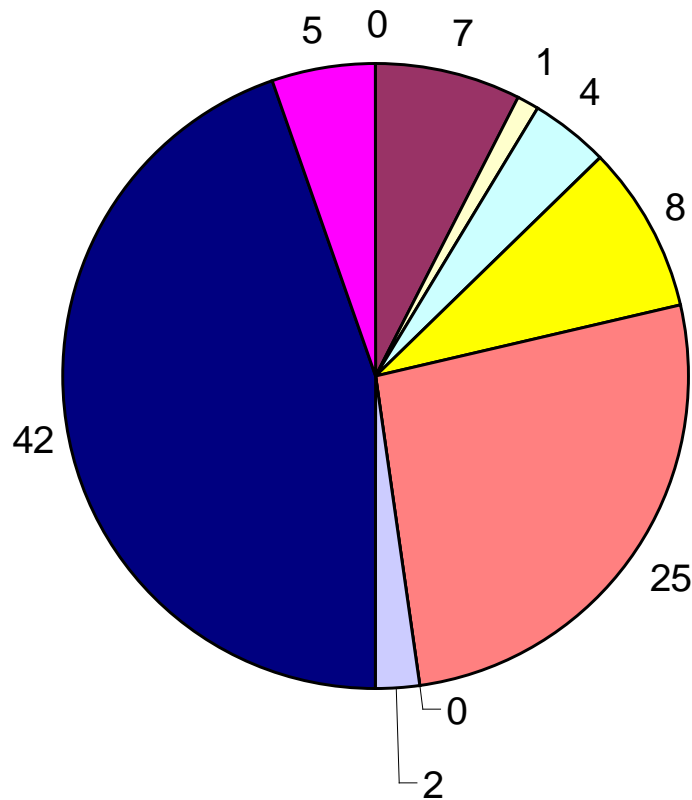
- The following slides are based on ALL TAXA introduced into at any time into the following states.
- Data includes species that did not persist (including single individuals).
- The colors have been standardized, so a specific color always means the same pathway.

# All Taxa

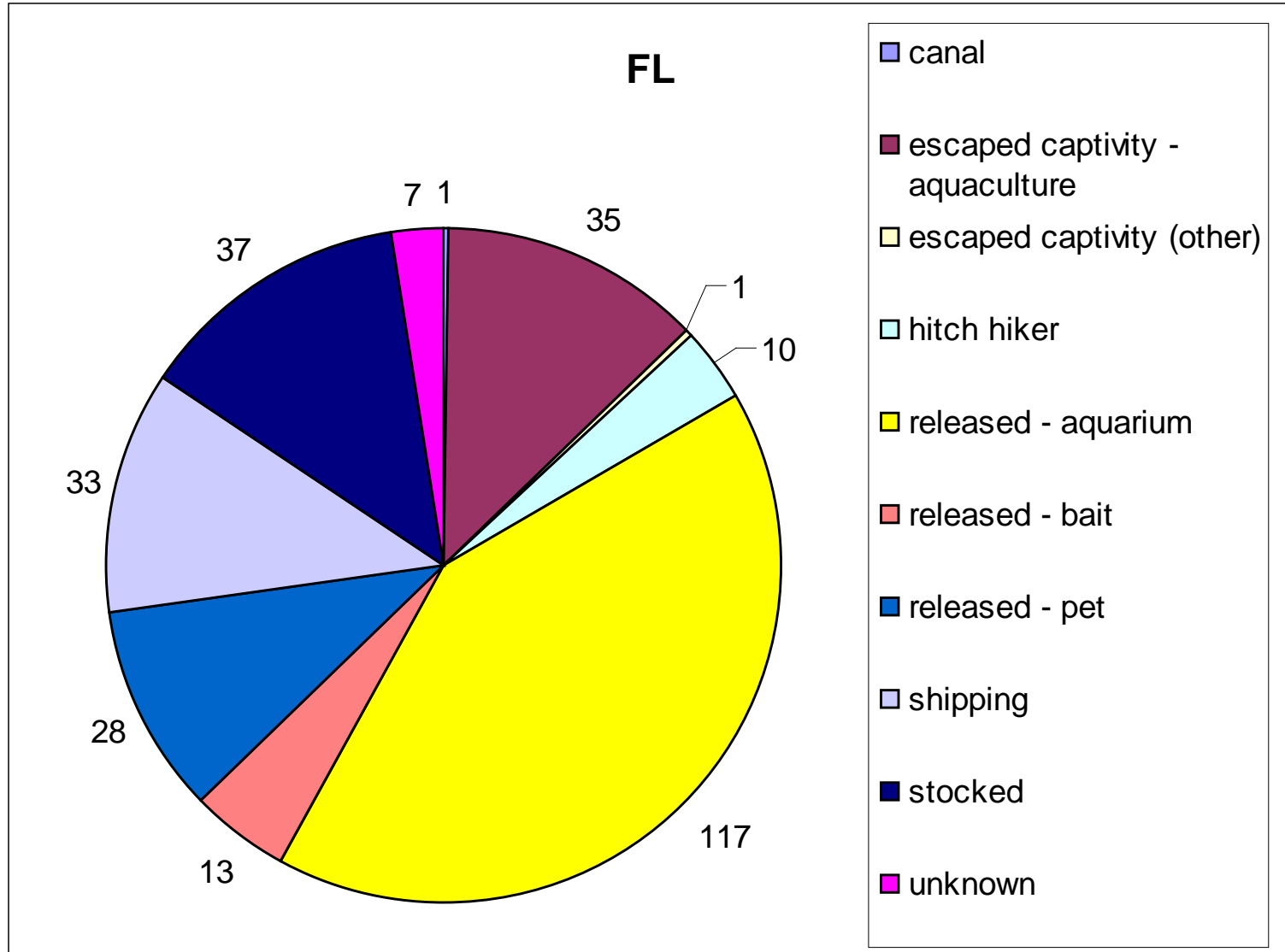




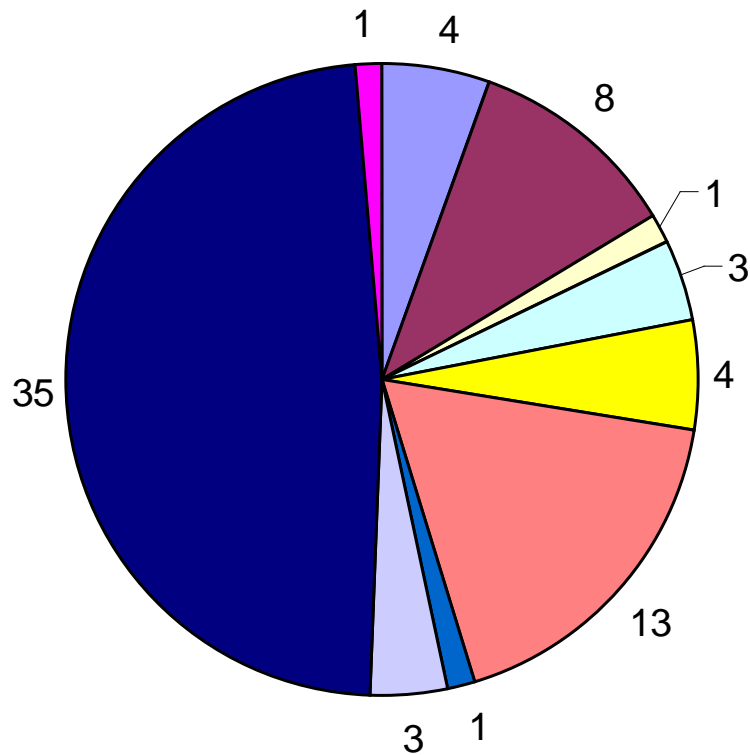
# GA



- canal
- escaped captivity - aquaculture
- escaped captivity (other)
- hitch hiker
- released - aquarium
- released - bait
- released - pet
- shipping
- stocked
- unknown

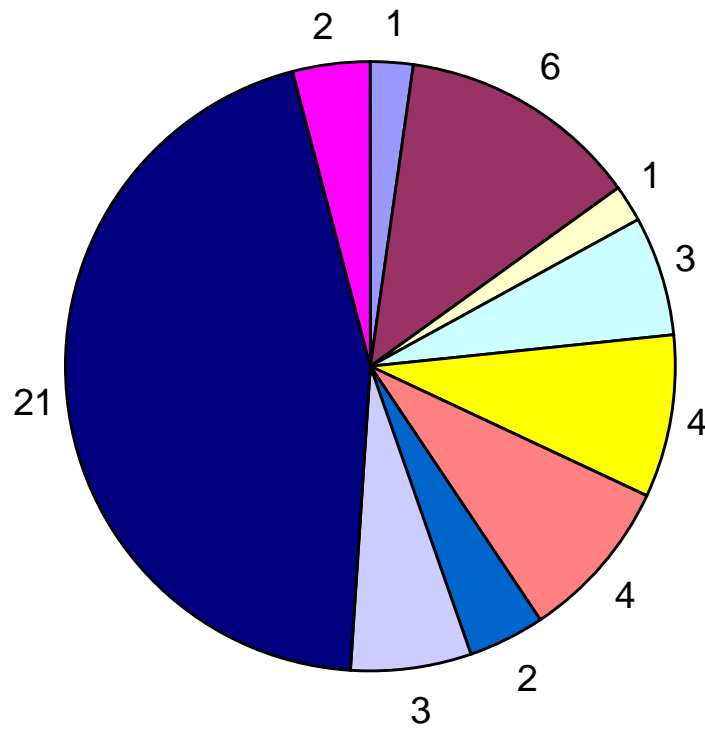


AL



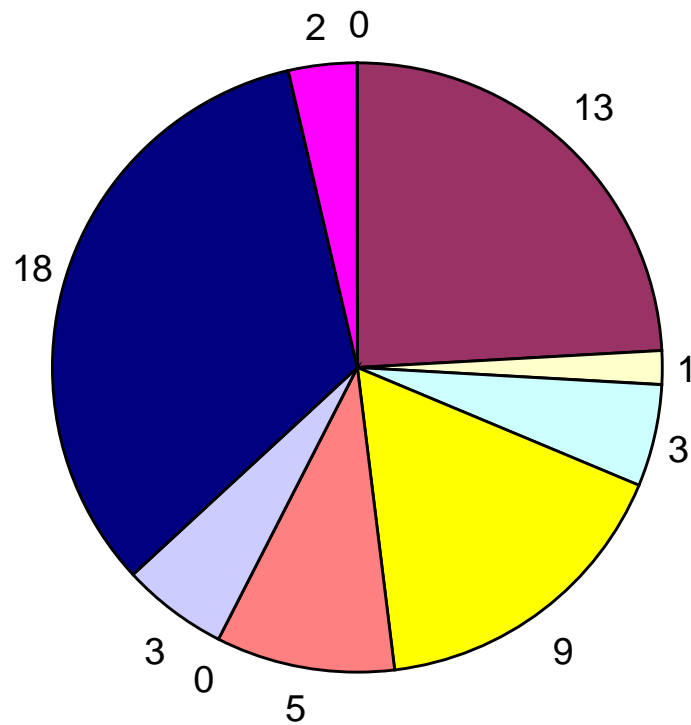
- canal
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## MS



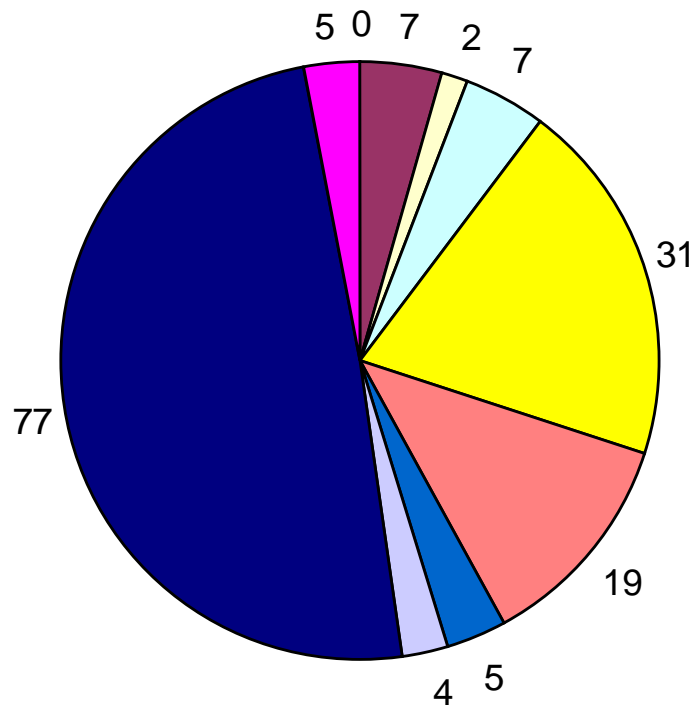
- canal
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# LA



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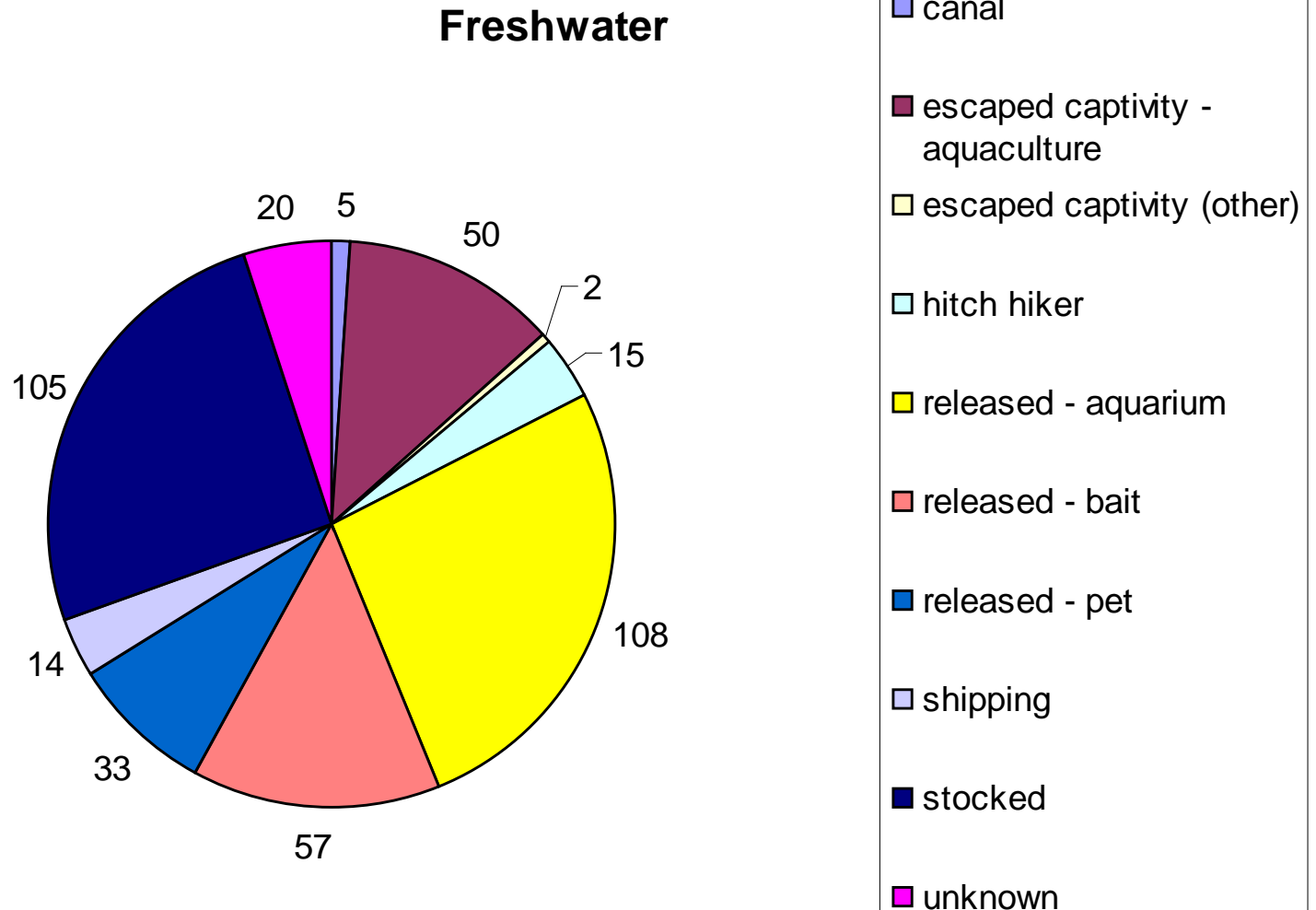
## TX



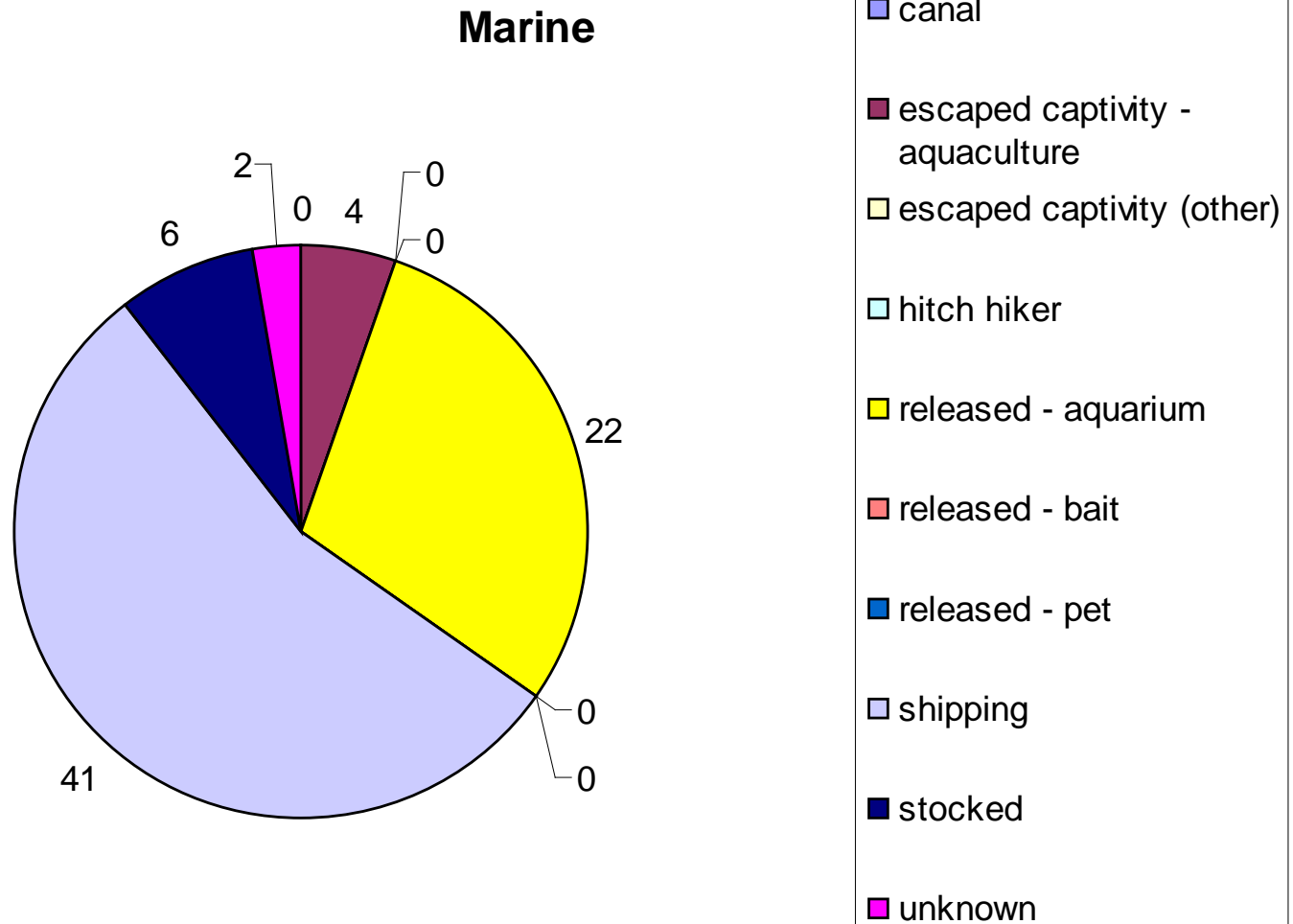
- canal
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- The following data are based on ALL TAXA but broken down into freshwater or marine introductions (not species origin)
- Anything coastal was considered marine.
- Data includes species that did not persist (including single individuals).

# Freshwater introductions

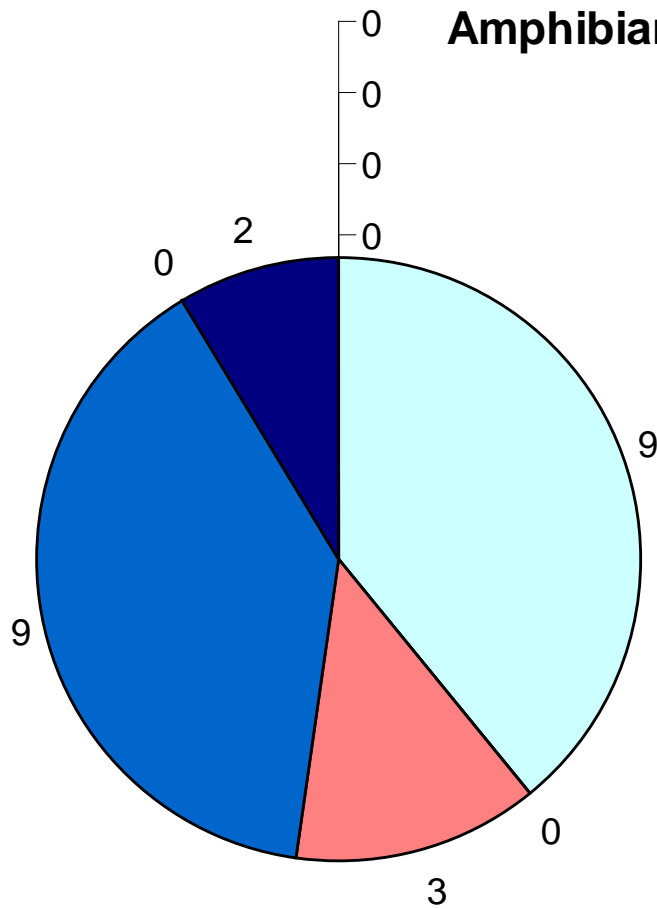


# Marine Introductions

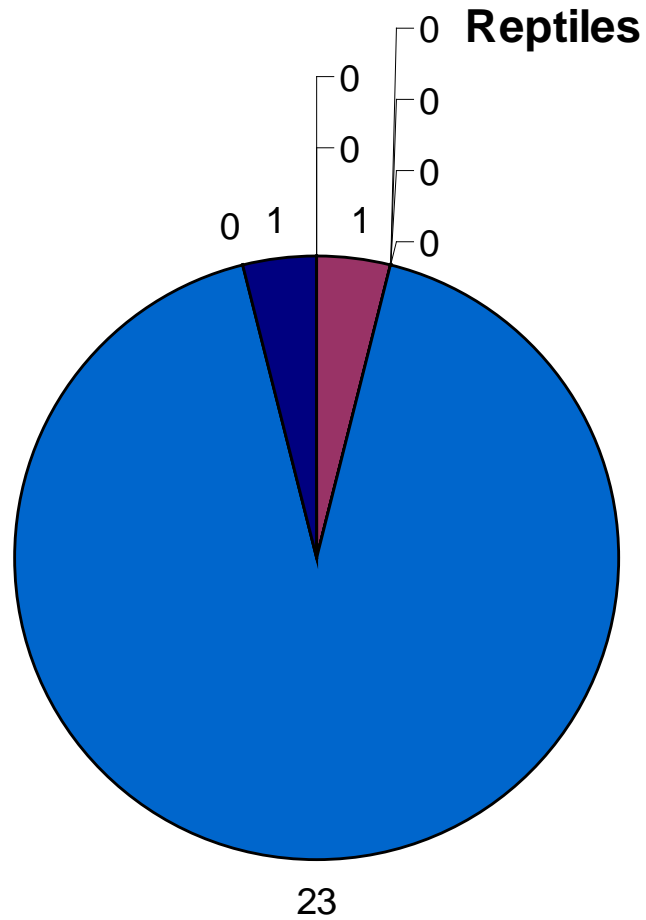


- The following slides are based on all species introduced at any time from a taxonomic group.
- Data includes species that did not persist (including single individuals).

## Amphibians

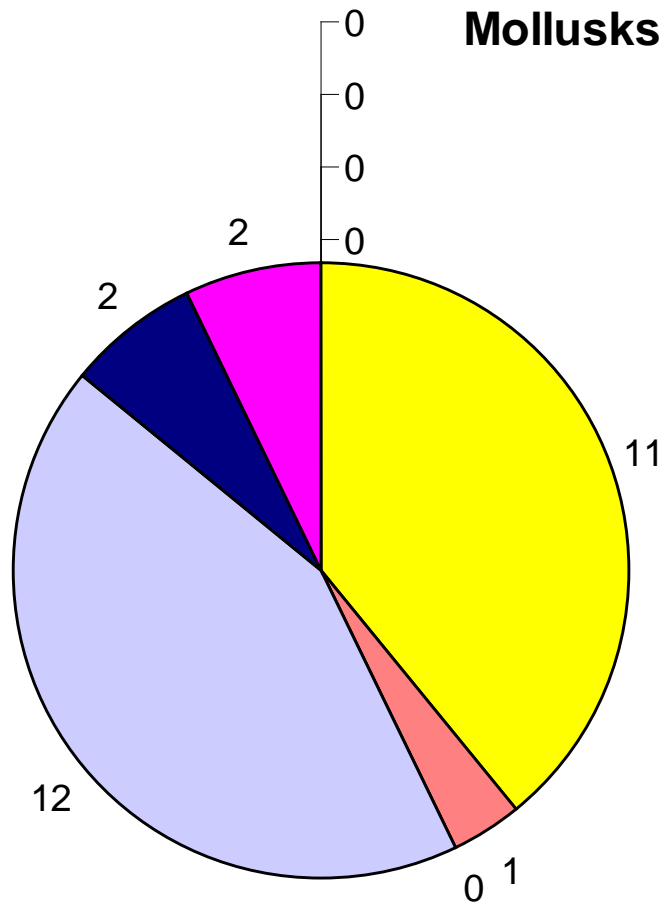


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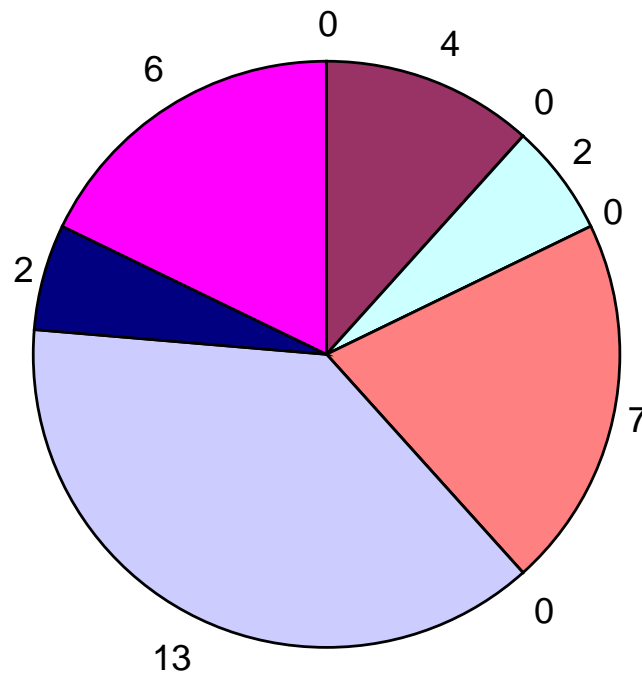
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## Mollusks



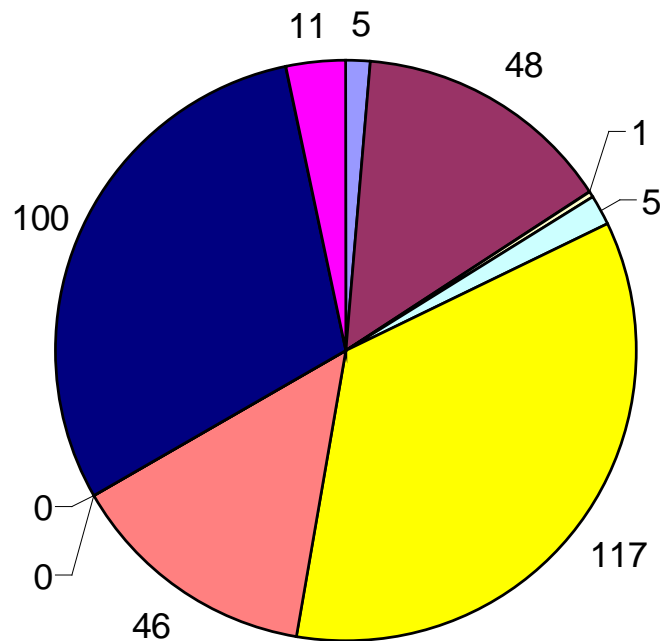
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- released - aquarium
- released - bait
- released - pet
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## Crustaceans



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- unknown

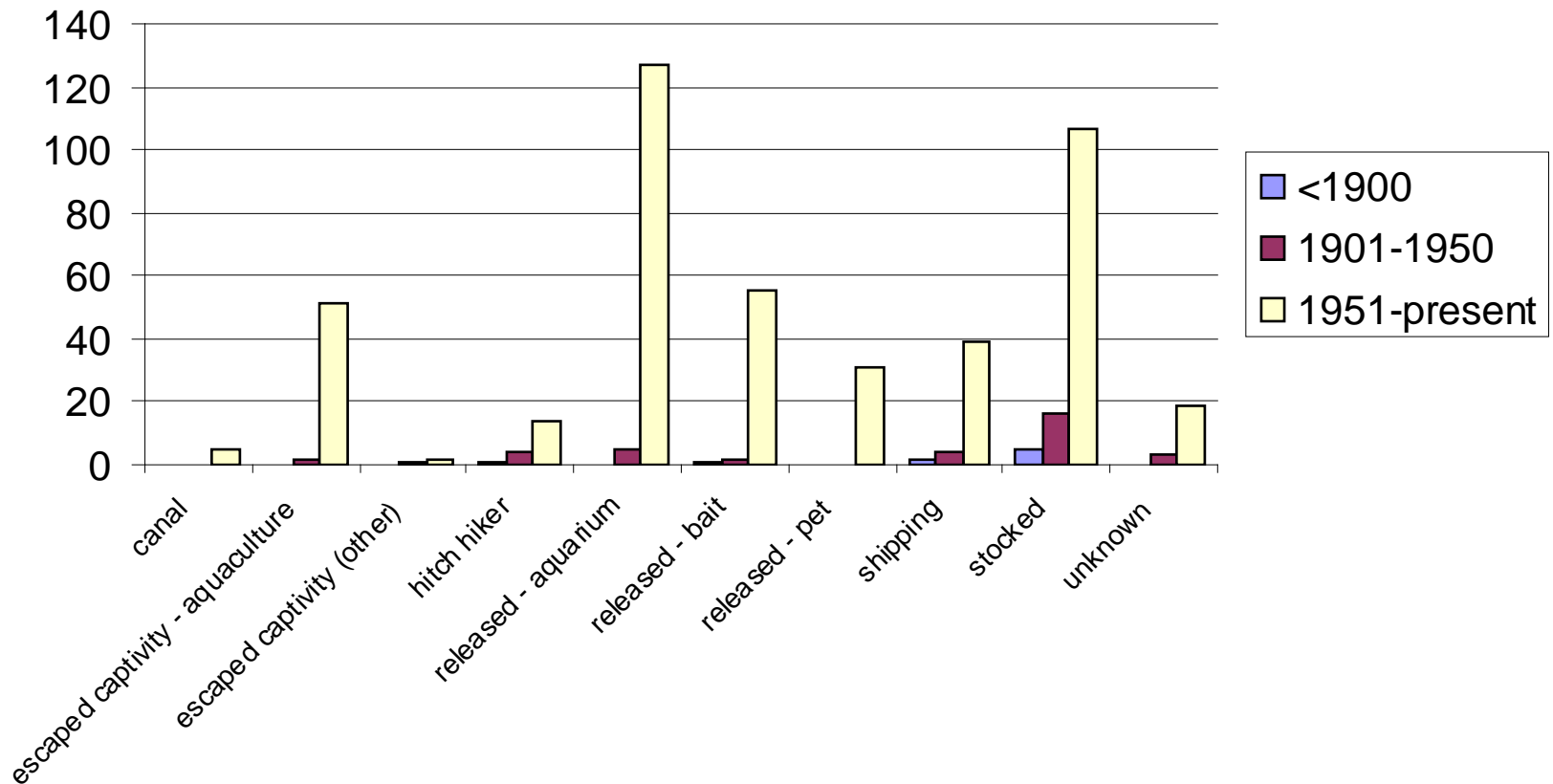
## Fishes



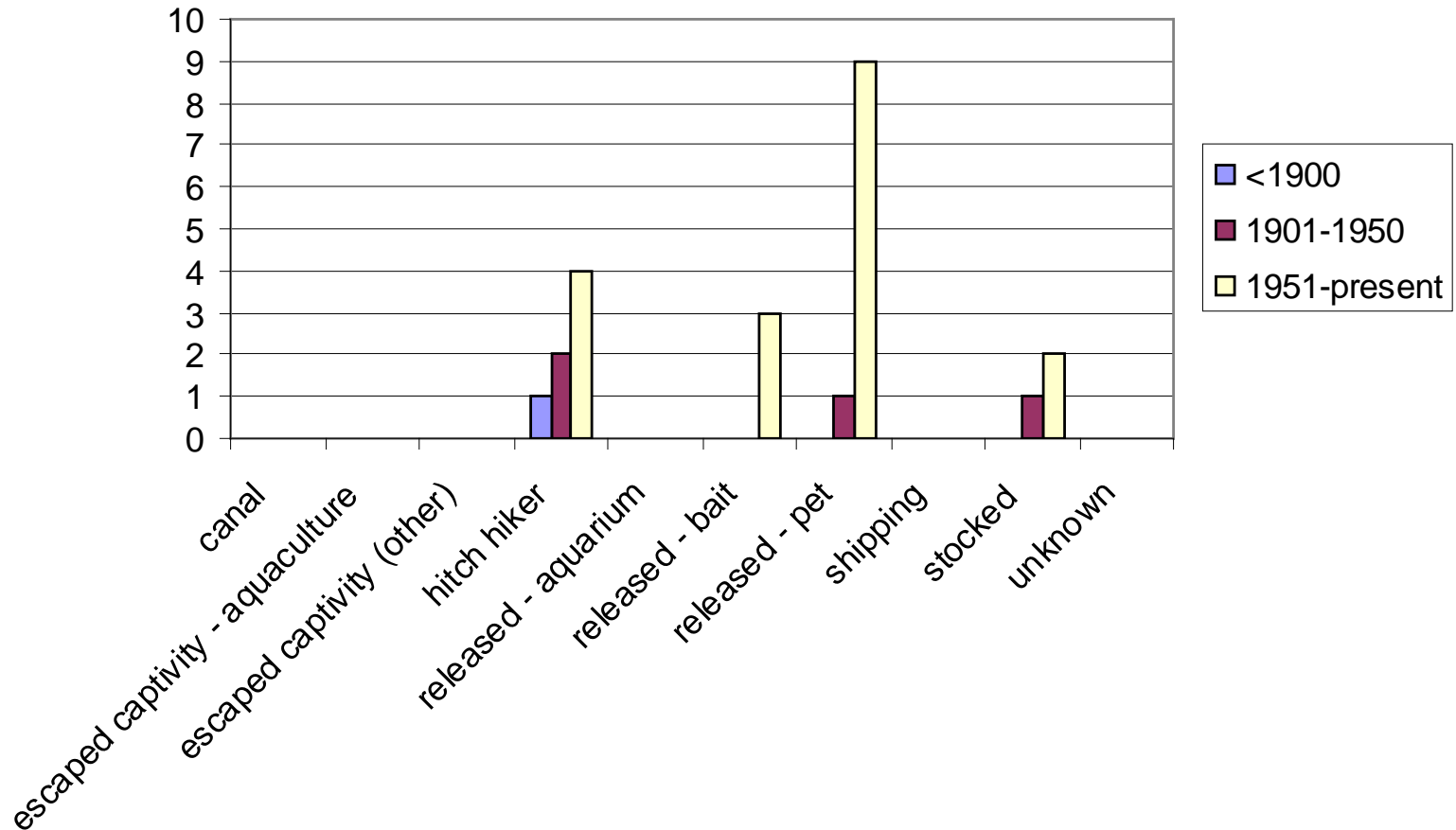
- canal
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- hitch hiker
- released - aquarium
- released - bait
- released - pet
- shipping
- stocked
- unknown

- The following slides are analyzed by ~50 blocks of time.
- Data includes species that did not persist.
- A species may be counted in multiple blocks of time.

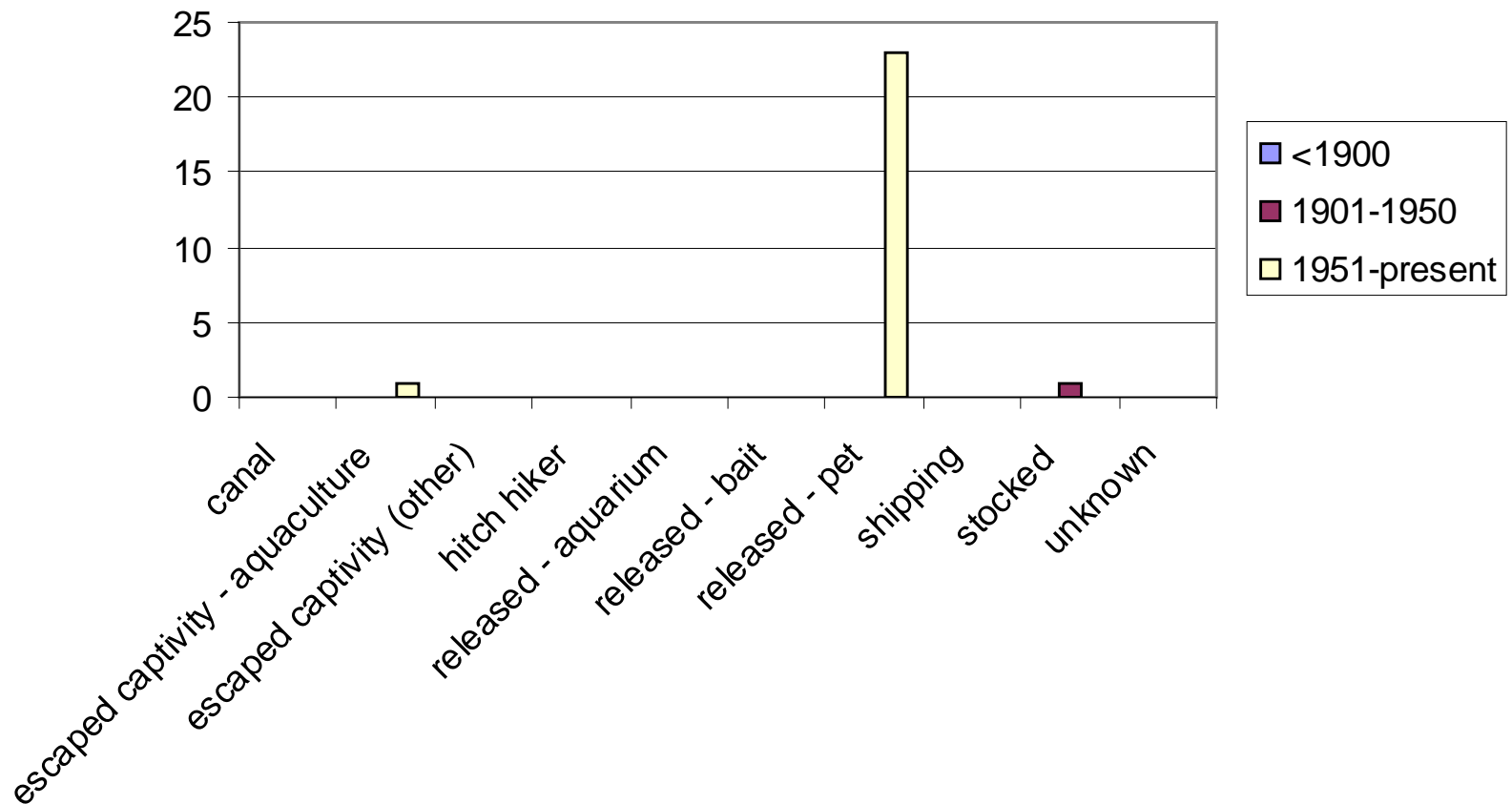
## Pathways in the SE through time



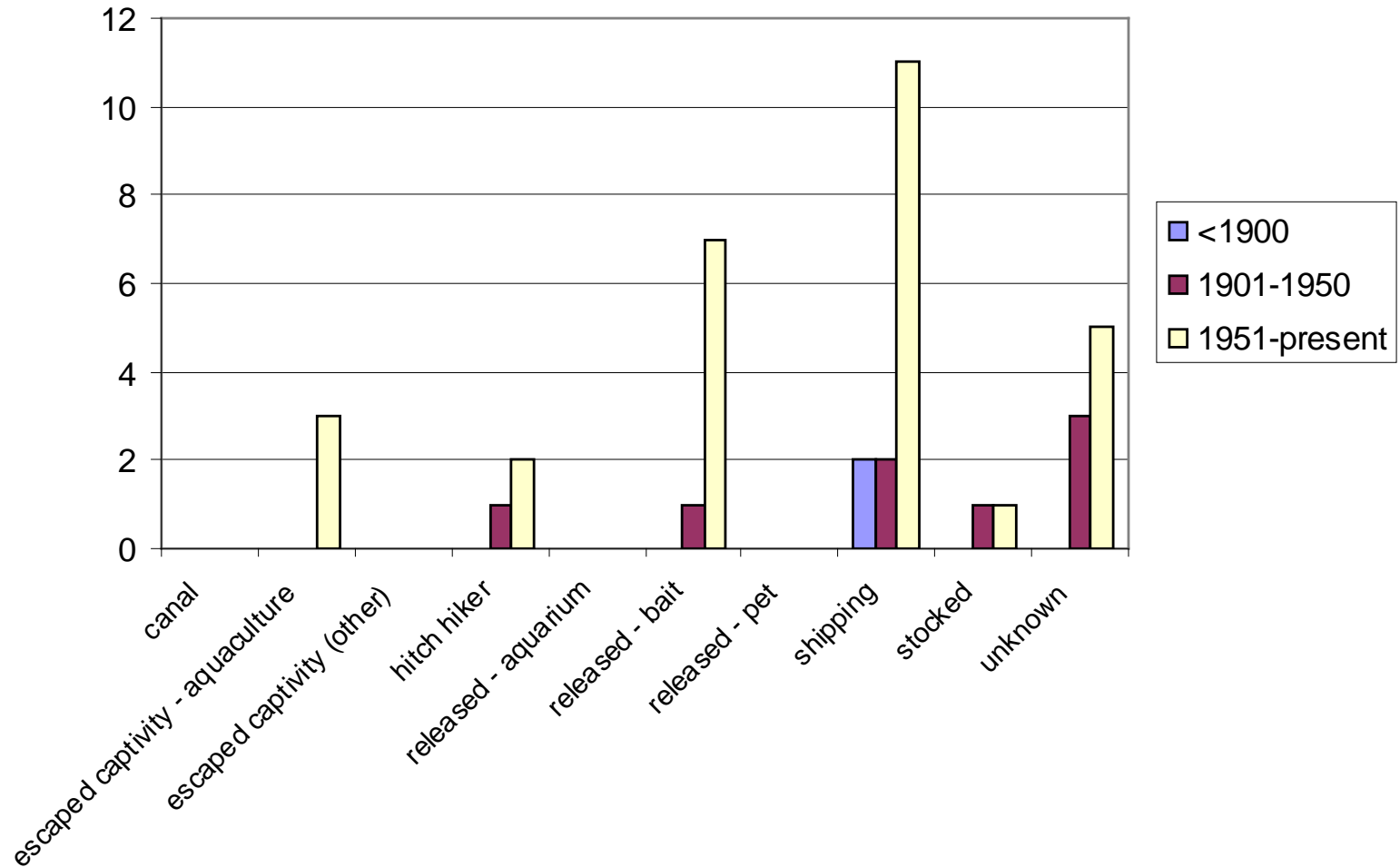
## Amphibians in the SE



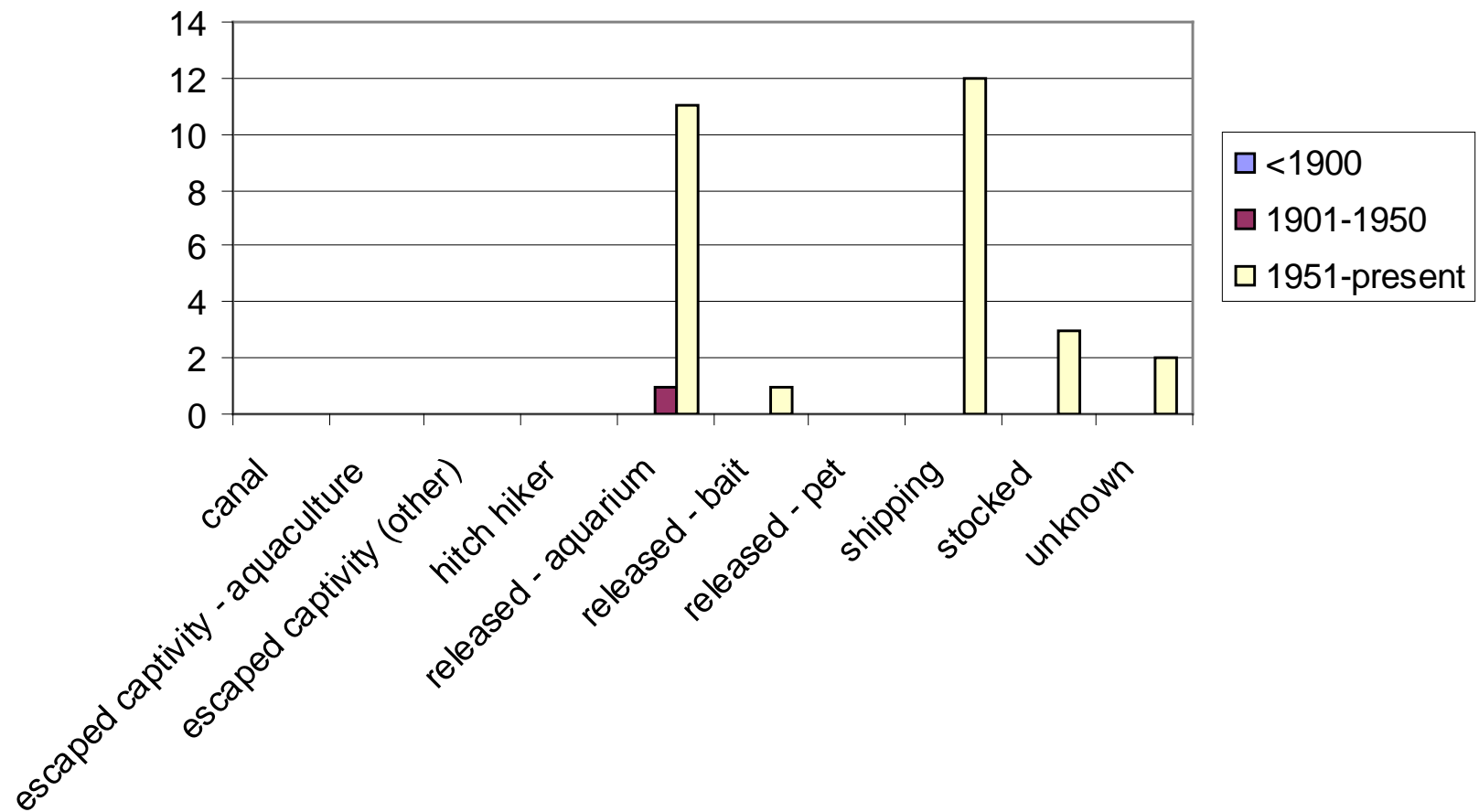
## Reptile pathways in the SE



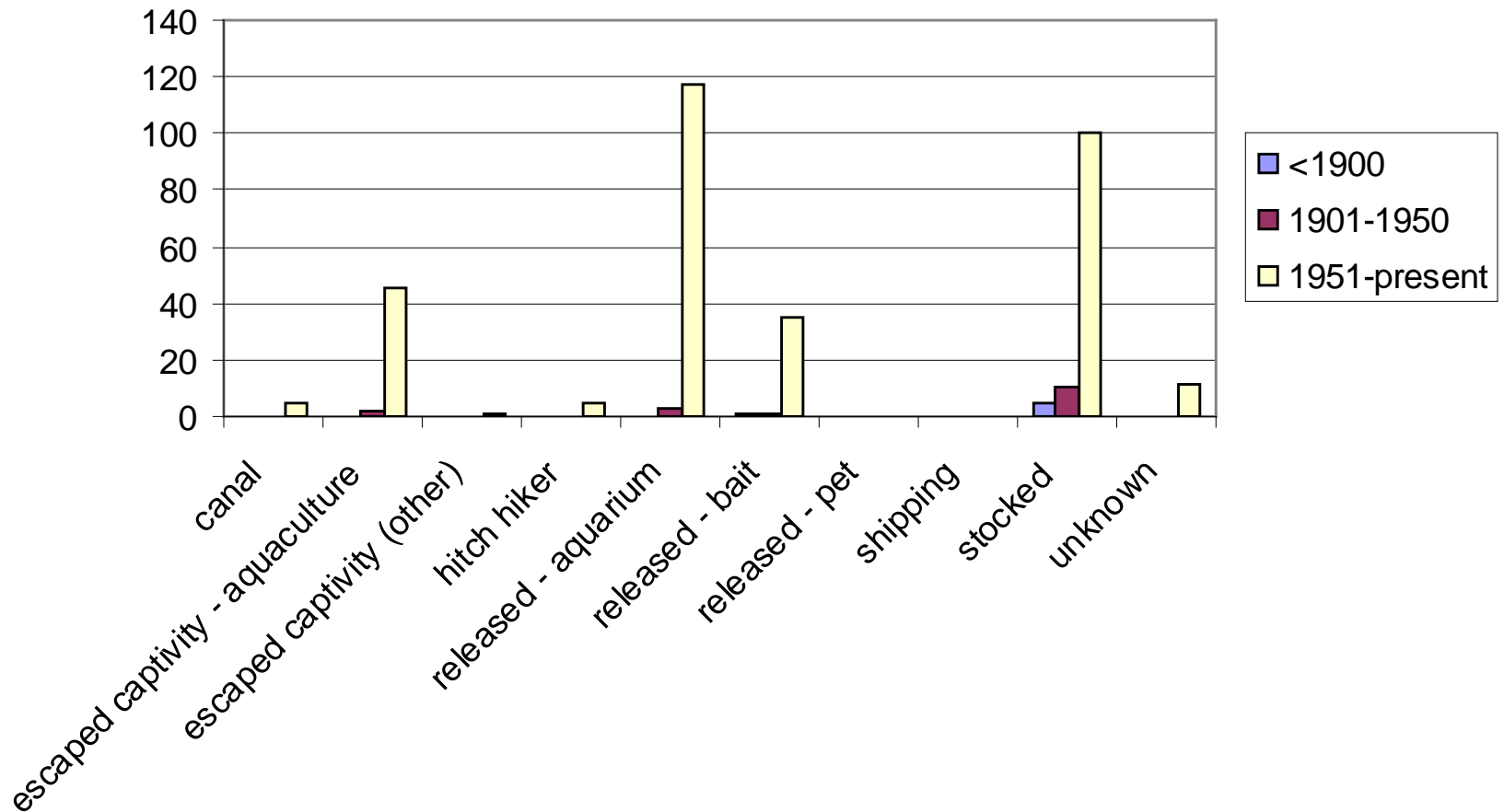
## Crustacean pathways in the SE



## Mollusks pathways in the SE



## Fish pathways in the SE

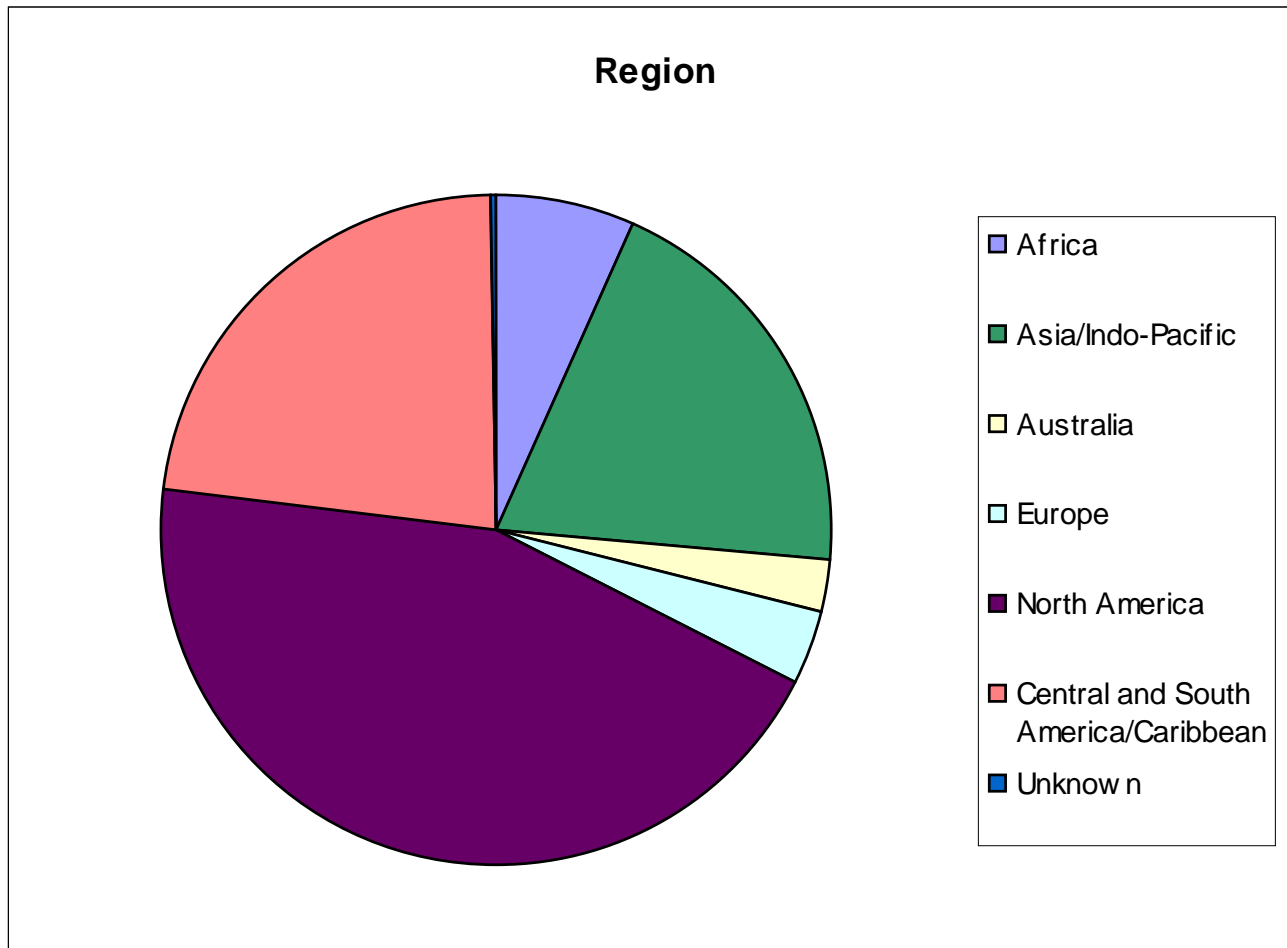


# Source Regions

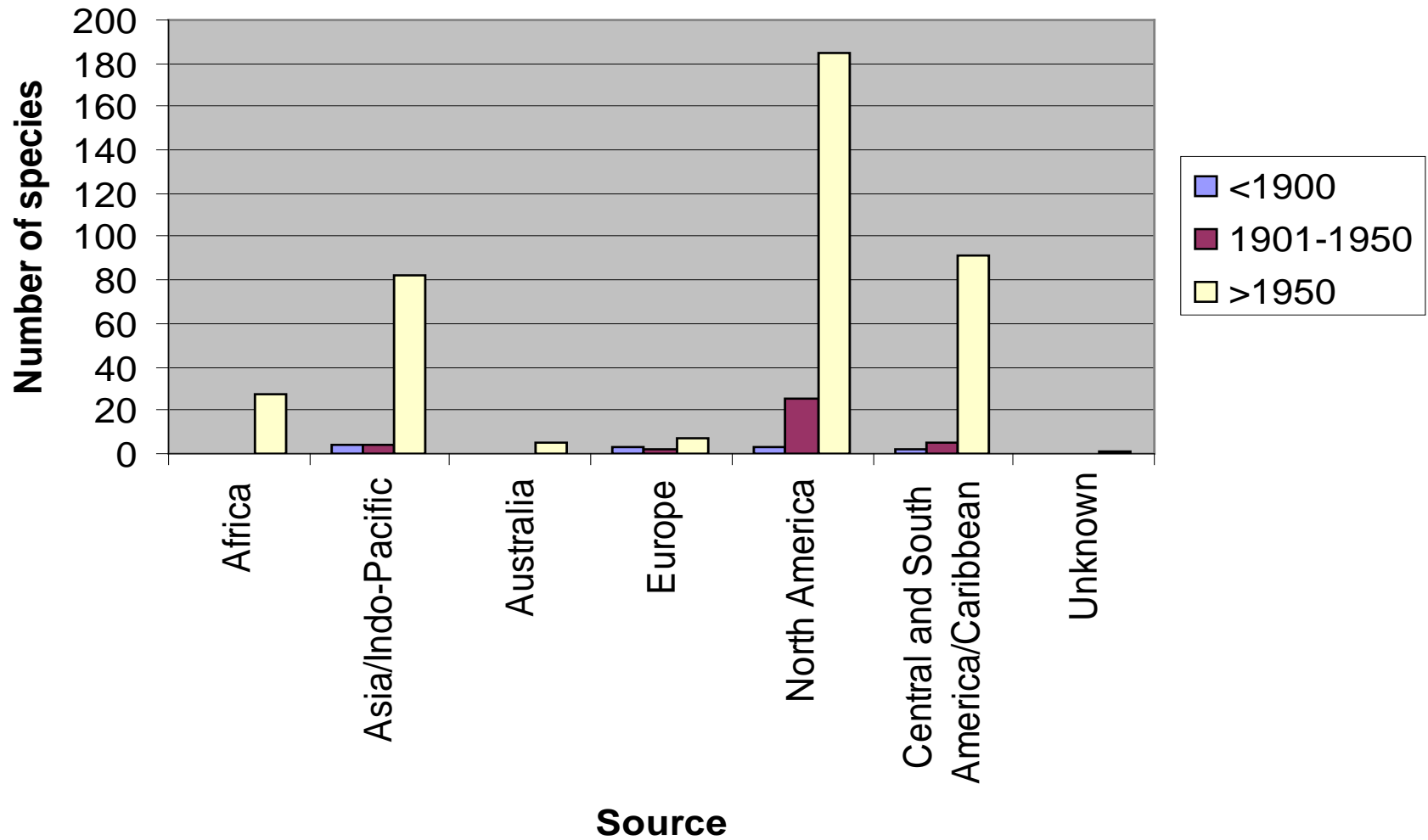
- The following is an analysis of source region
- Species may be counted multiple times if they are from a wide area (i.e., Eurasian species were counted in Europe and Asia)
- Species will also be counted multiple times if they were introduced by multiple pathways.



# Source Regions for All Gulf and South Atlantic Introductions

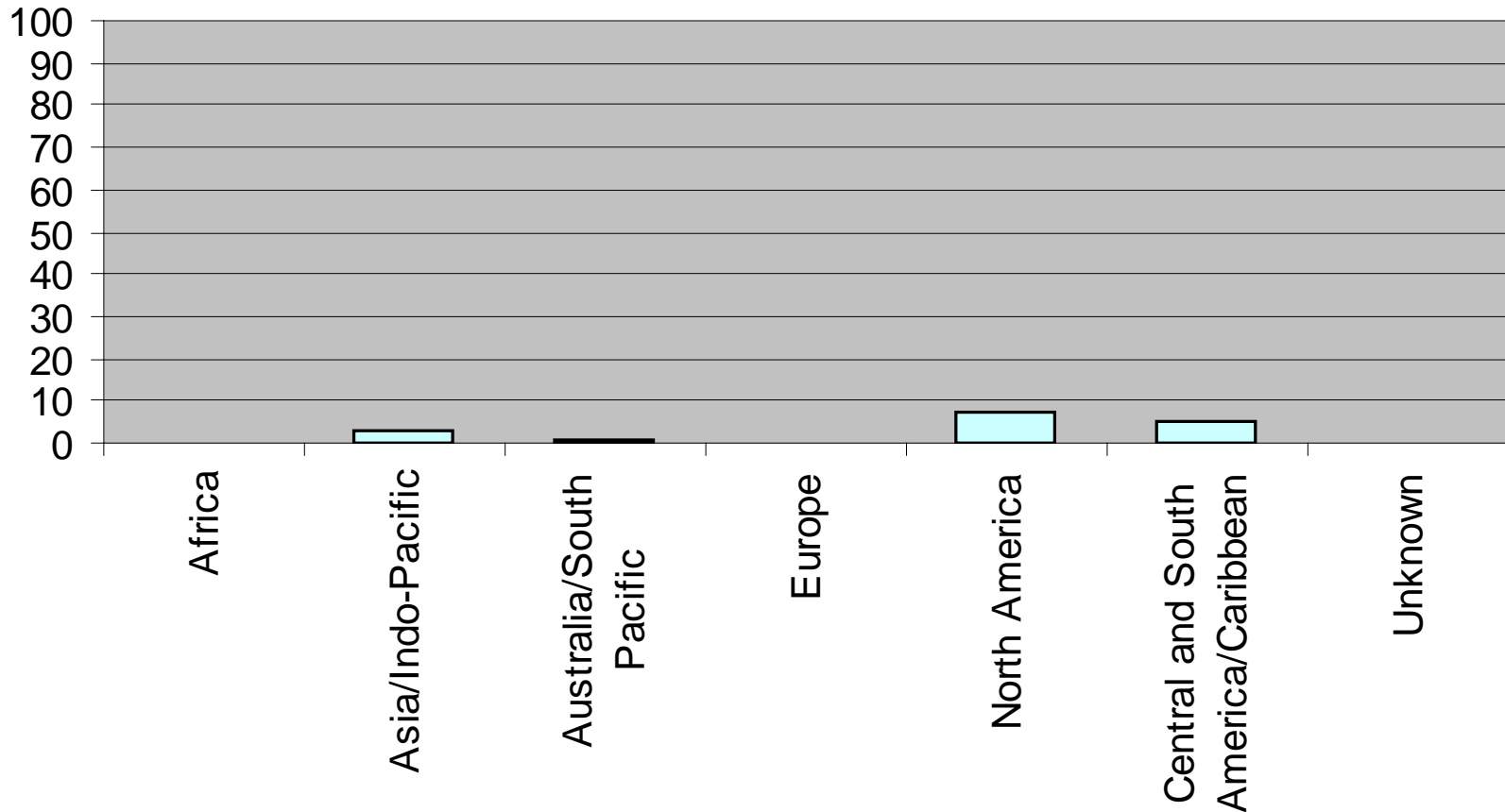


## Region by Time



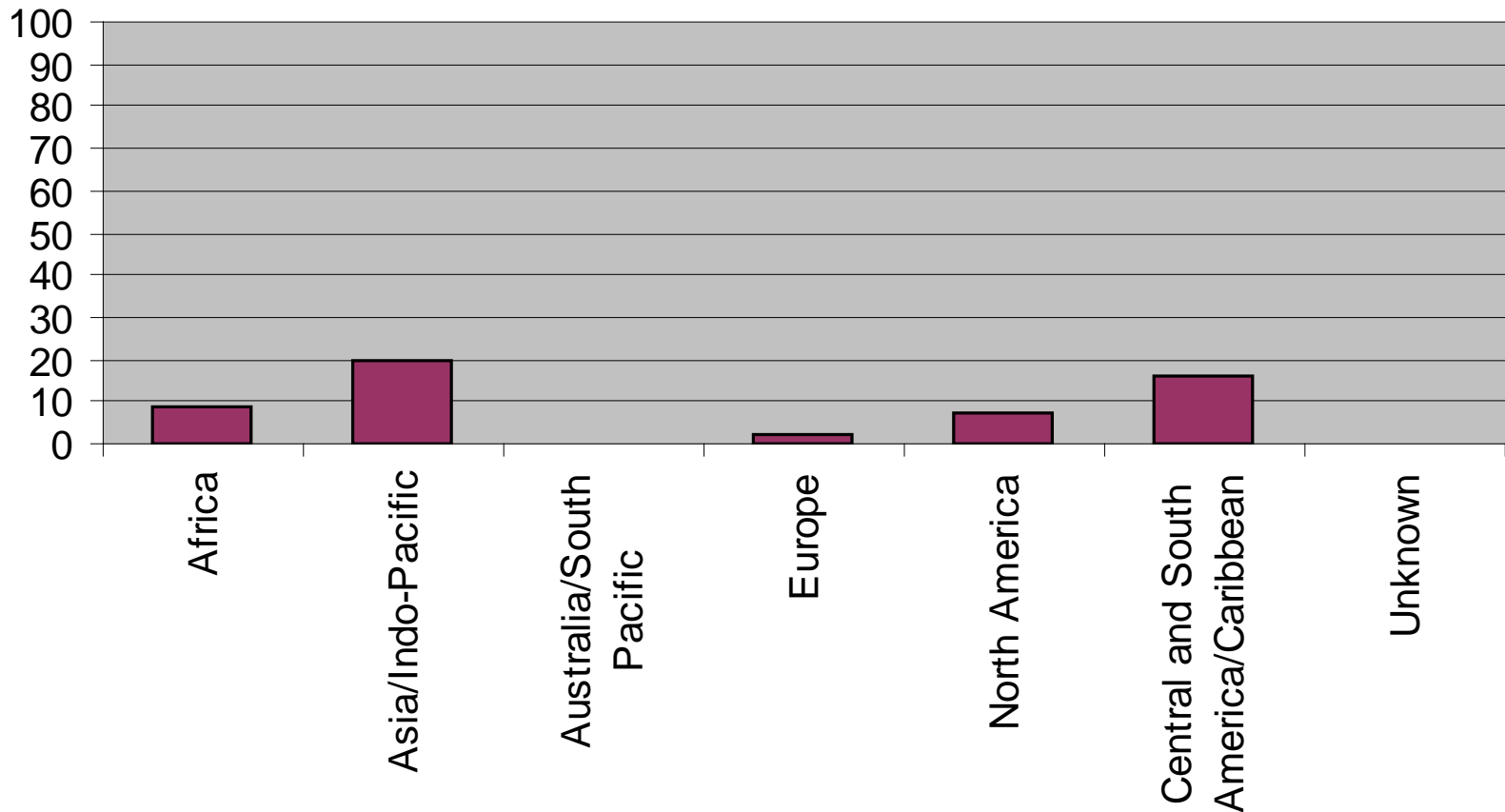
# Sources of hitch hikers

hitch hiker



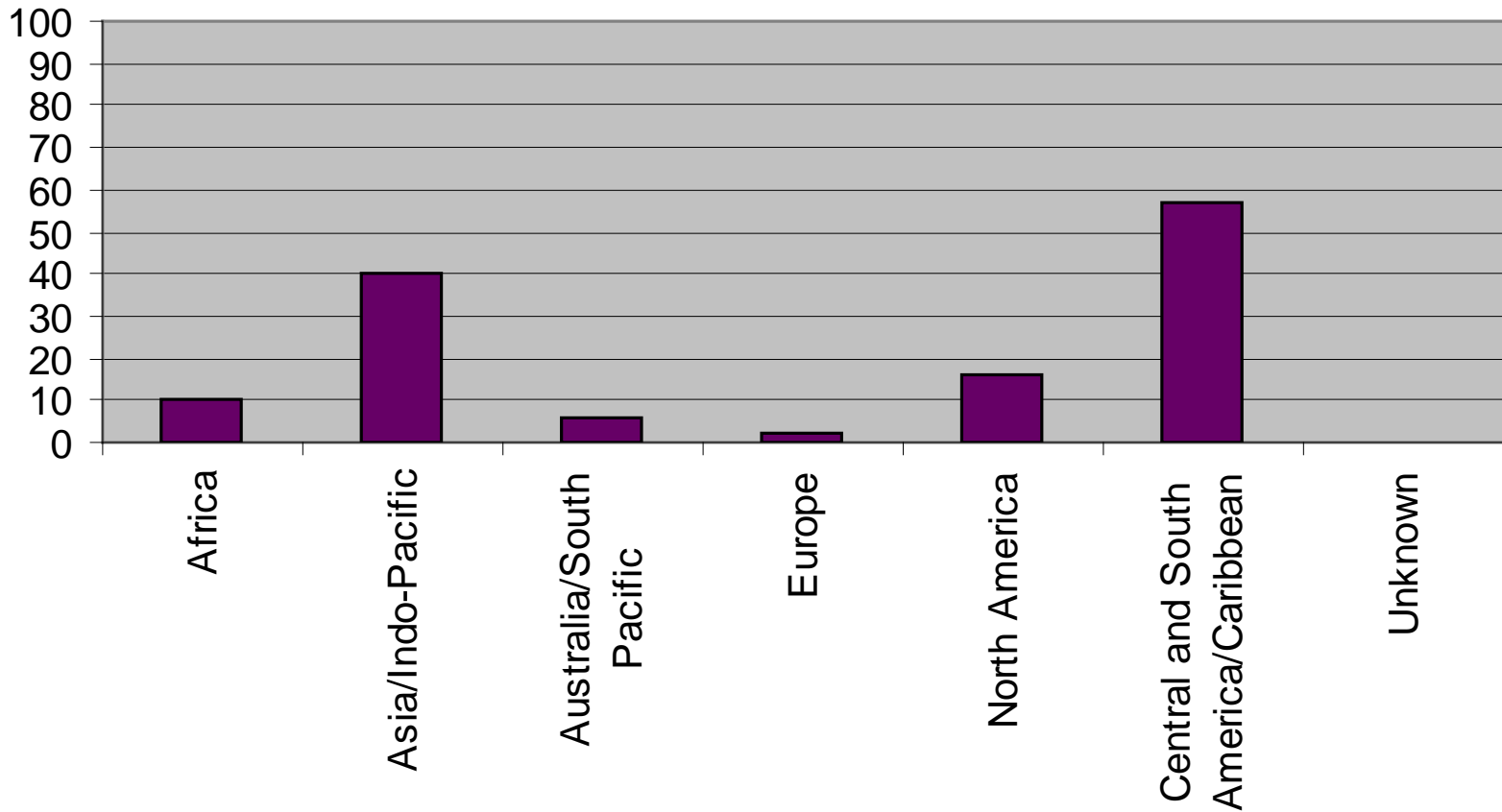
# Sources of aquaculture species

aquaculture



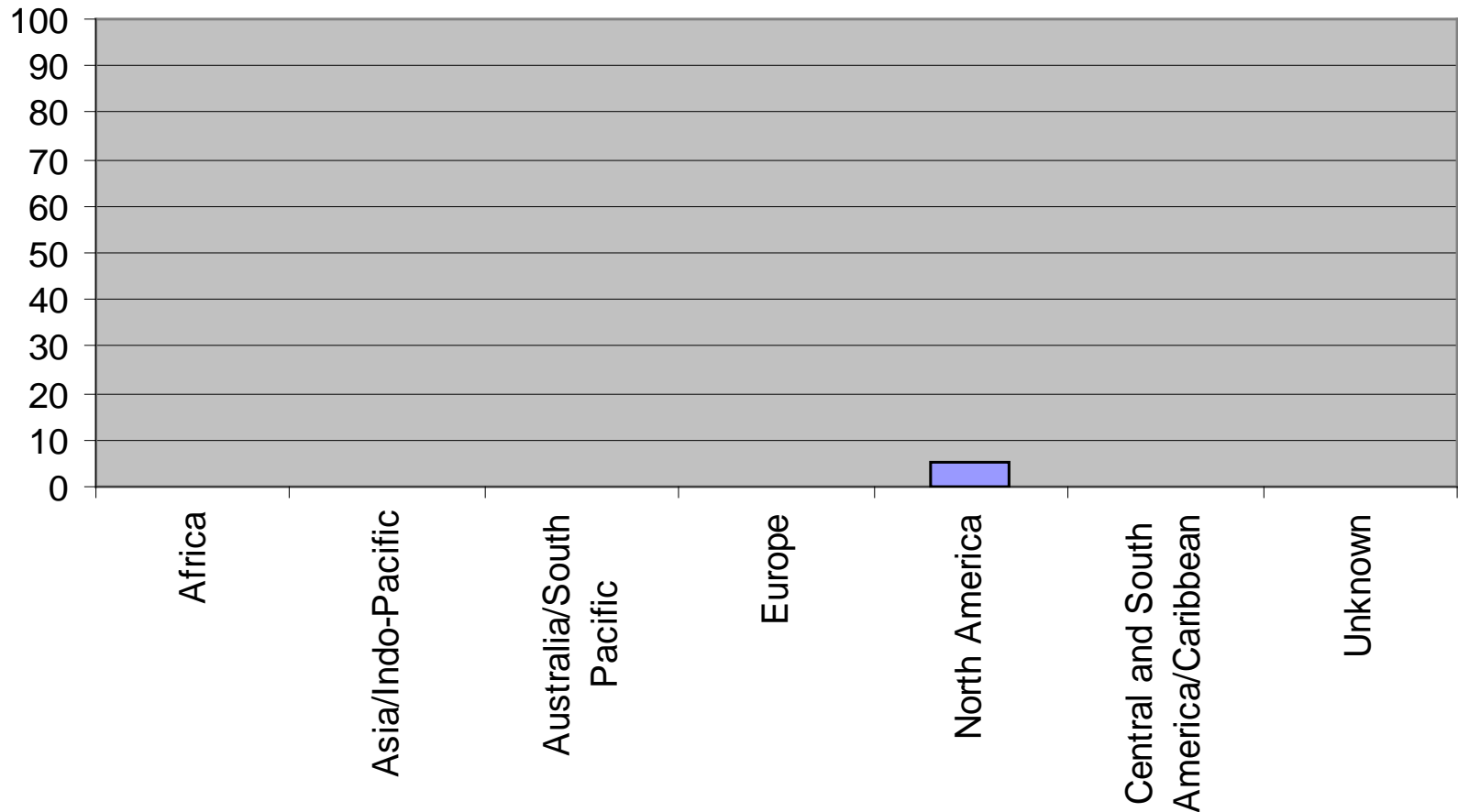
# Sources of aquarium species

aquarium



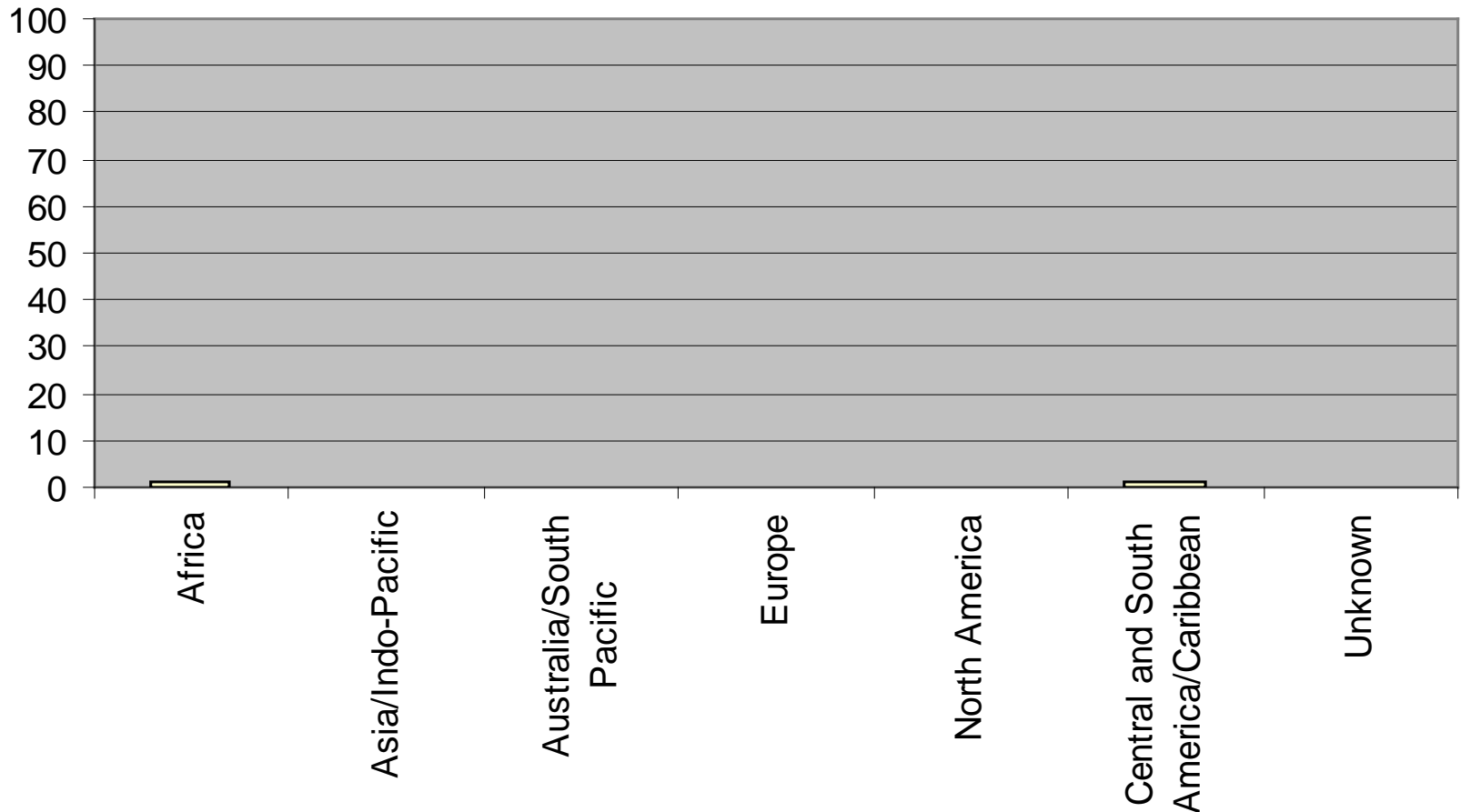
# Sources of canal introductions

canal

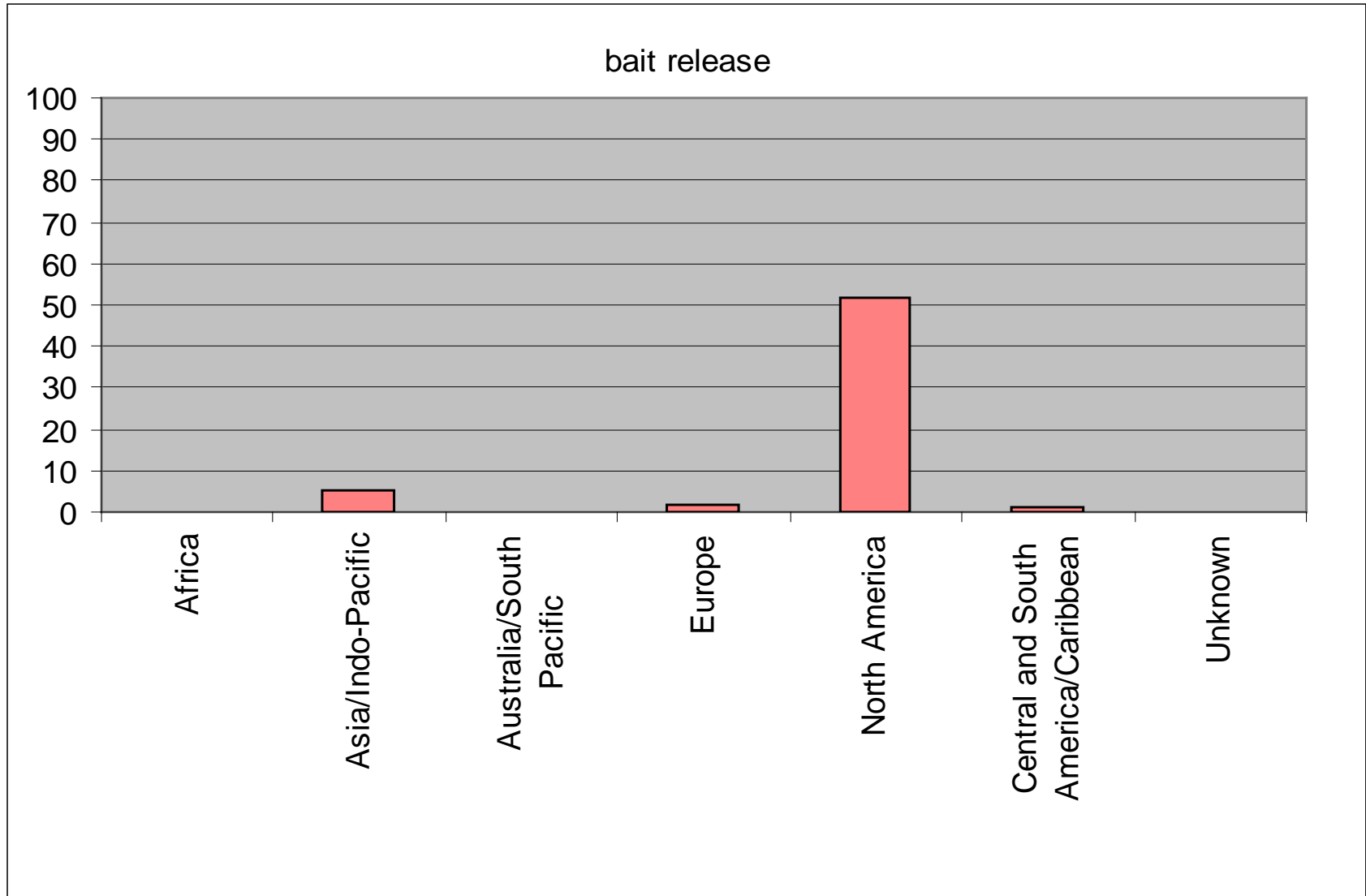


# Sources of escaped species

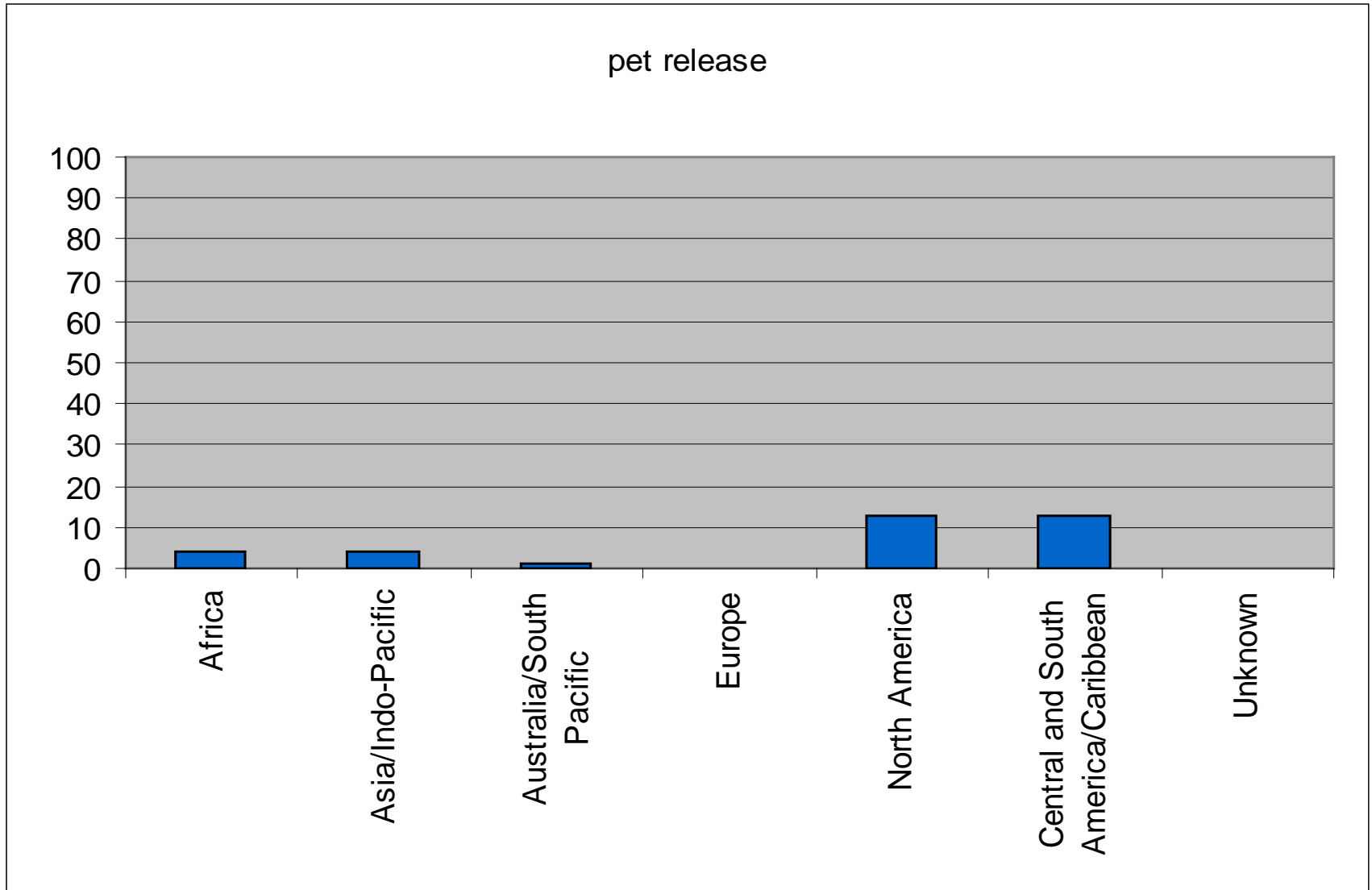
escaped captivity



# Sources of bait species

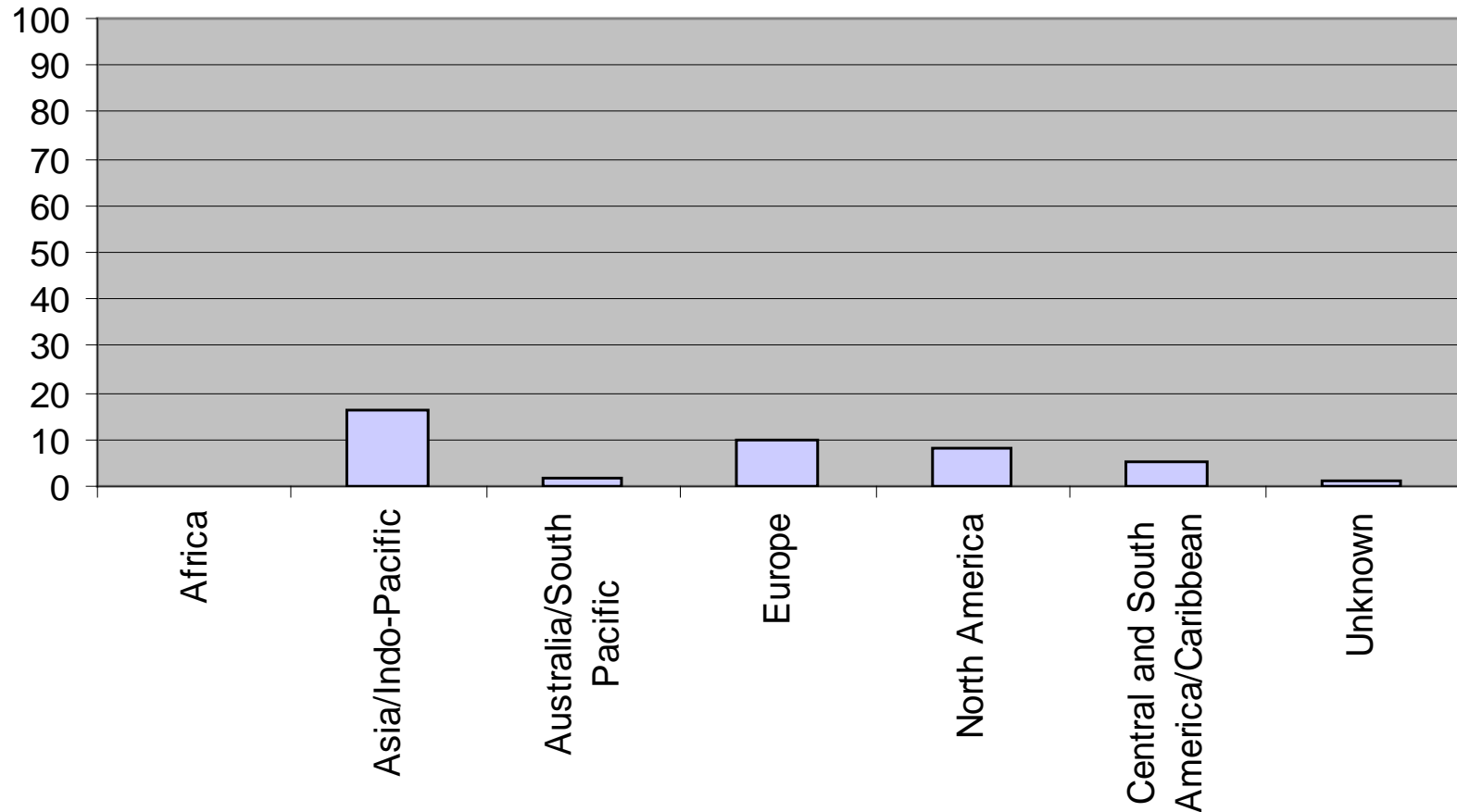


# Sources of pet species

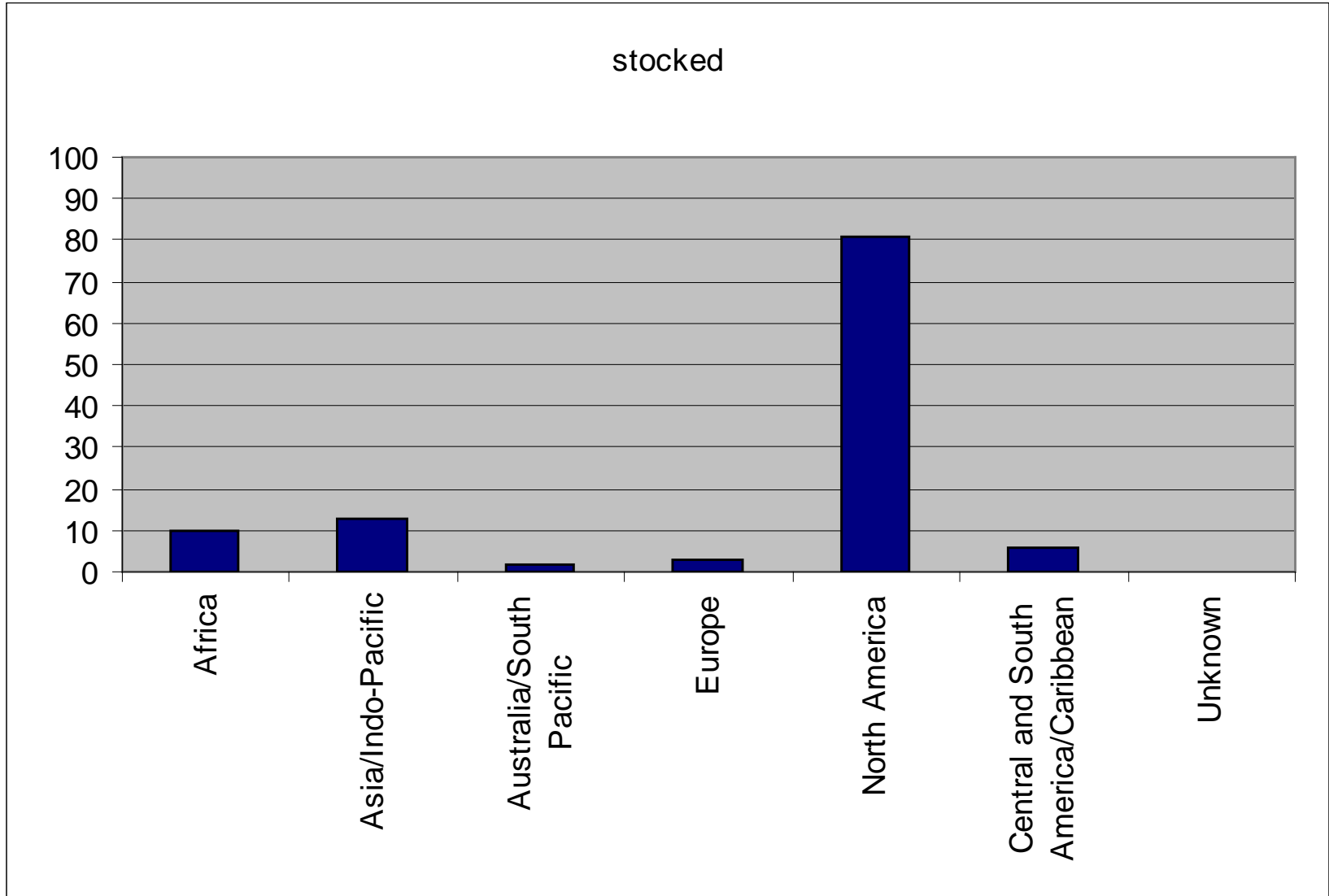


# Sources of shipping species

shipping



# Sources of stocked species



# Sources of species by unknown pathway

