Adaptations of Dolphins
Exploring Evolutionary Principles

Background Information

Freshwater dolphins are threatened wherever they occur, vulnerable because of their high level of specialization and imperiled by habitat alterations, exploitation and the disruption of the aquatic ecosystems on which they depend. The study of the populations is difficult because of the frequently challenging environments in which they live: murky waters in remote locations make the location of individuals challenging and the small populations require that extreme care be taken during the study. Nevertheless, biologists are piecing together the evolutionary history of the dolphin and are working to develop strategies to protect all the species in the habitats in which they occur. They seek to answer the question of the origin of the freshwater dolphin.

The radiation of the whales is a complex story. Appearing in the Eocene, whales diverged into their two modern groups by the late Oligocene (University of California Berkeley, Museum of Paleontology, 2005). The evolutionary history of the four living genera of freshwater dolphins remains one of uncertainty (Table 1). Although all are grouped in the superfamily *Platanistoidae*, the basis of this classification grows largely from similarity in appearance and behavior rather than solid evidence of a common ancestor (Table 2). To answer the questions below, you must look for research to support the various theories proposed to explain the occurrence of similar species in geographically distant parts of the world.

Table 1. River Dolphins of the World

Baiji (Chinese River Dolphin; *Lipotes vexillifer*; declared extinct in 2007)
Boto (Amazon River Dolphin; *Inia geoffrensis*)
Franciscana (La Plata River Dolphin; *Pontoporia blainvillei*)
Ganges River Dolphin (*Platanista gangetica*)
Indus River Dolphin (*Platanista minor*)

Table 2. Taxonomy of the dolphin family

Kingdom Animalia
    Phylum Chordata
        Class Mammalia
            Order: Cetacea
                Suborder Odontoceti (toothed whales)
                    Nine families of dolphins

Research Questions

1. Using on-line resources, describe the features and characteristics of river dolphins (see Table 1 for a species list) that have led to their frequently being placed in a single group. What selective pressures have led to these adaptations?

2. Is a "convergent evolutionary model" appropriate to explain similarities among the different genera, one in which the marine species left the ocean and each evolved similar characteristics in response to the similar conditions found in the rivers in which they settled? Is it possible that once a freshwater dolphin had evolved it slowly migrated to rivers in distant parts of the globe?

3. Discuss how the human uses of the Ganges may threaten the Gangetic Dolphin. Killing of the dolphins for food or because they are seen as competitors for the commercial fish may provide some explanation for the decline, but other factors may indirectly lead to the extinction of the species. What are these and how might they be controlled to allow for the recovery of the dolphin?

4. Describe the factors that led up to the extinction of the Chinese River Dolphin. What steps could be taken to increase the likelihood of survival of the other species faced with similar threats?