ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Invertebrate Abstract **Element Code:**IMGASD7020
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Helix aspersa*
COMMON NAME: Brown Garden Snail, European Brown Snail, European Garden Snail
SYNONYMS: *Cornu aspersum, Cryptomphalus aspersa, Cantareus aspersus*
FAMILY: Helicidae

AUTHOR, PLACE OF PUBLICATION: Müller, O. F., 1774. Vermium terrestrium et fluviatilium seu animalium infusorium, helminthicorum, et testaceorum non marinorum succincta historia.

TYPE LOCALITY: First specimen was described from Italy in the late 1700's.

TYPE SPECIMEN:

TAXONOMIC UNIQUENESS:

DESCRIPTION: According to Burch (1960), as cited by Dekle and Fasulo (2001), Shell is large, globose, rather thin, imperforate or nearly so, moderately glossy, sculptured with fine wrinkles. It is yellow or horn-colored with chestnut brown spiral bands, which are interrupted, by yellow flecks or streaks. The aperture is roundly lunate to ovate-lunate, the lip turned back. Adult shells (four to five whorls) measure 28 to 35 mm. Brown garden snails attain a diameter of 16 to 20 mm within one year, and 26 to 33 mm by their second year. Juvenile shells have one whorl only when newly hatched, smooth, light brown, speckled black, lacking any pattern of bands and flecks. These snails have pale gray moist skin. At the front end are four tentacles, the shorter two are for feeling and the longer pair are eye stalks.

AIDS TO IDENTIFICATION: *H. pomatia* is closely related to *H. aspersa*, so differentiating between the two can be difficult. Both are virtually identical in shell coloring, banding, and number of whorls. *H. pomatia* can be distinguished, though, by its large size, growing 40 to 55 mm, which is about 15-20 mm larger than *H. aspersa*.

ILLUSTRATIONS: Color photo (Frank *in* http://www.jaxshells.org/cornu.htm)
Color photo of infested tree (*In* http://edis.ifas.ufl.edu/IN396)
Color photos (BBC *in* http://www.bbc.co.uk/nature/wildfacts/factfiles/415.shtml)
Color photos (*In* http://members.tripod.com/arnobrosi/gallery.html)

TOTAL RANGE: According to Burch (1960), as cited by Dekle and Fasulo (2001), the reported natural distribution of *H. aspersa* is in Britain, Western Europe, and along borders of the Mediterranean and Black Seas. It has been introduced into the Atlantic Islands, South Africa, Haiti, New Zealand, Australia, Mexico, Chile and Argentina. According to Beaquart & Miller (1973), H. aspersa is now fully established in the warm temperate United States as well as in British Columbia and Canada.

RANGE WITHIN ARIZONA: Yuma, Prescott, Phoenix, Tucson, possibly statewide.

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Terrestrial and mostly nocturnal non-native snail that is considered to be a nuisance species. When dry conditions prevail, the snail may seal itself to various objects or close the shell opening with a parchment-like epiphragm. When sealed away like this the snail goes into a state of suspended animation and can survive for several months without water. With the advent of humid conditions, the snail again becomes active. Snails move with a gliding motion by means of a long flat muscular organ called a foot. Mucus that is constantly secreted by glands in the foot, facilitate movement and leaves a silver-like slimy trail. (Dekle and Fasulo, 2001).

REPRODUCTION: *Helix aspersa* is hermaphroditic with the ability to self-fertilize, though they usually prefer to cross-fertilize. This is one of many species of land snail that will inject a "love dart", whose function is controversial, into its partner during precopulatory behavior. After touching tentacles, the two snails rise upwards slightly on their creeping soles until their mouths are in contact. They 'kiss' for a minute or two and then lean over slightly to mouth one another's genitals, which by now will be semi-everted. The next major step, about 30 minutes into the ritual, is mutual stimulation of the genital areas. This causes one of the snails to propel a love dart into its partner's body. Mating for this species requires 4 to 12 hours. Oviposition occurs 3 to 6 days after fertilization. White spherical eggs about 1/8 inch in diameter are deposited in a nest constructed by the snail, which uses its foot to shovel soil upwards. The nest is about 1 to 1 1/2 inches deep. The egg mass is concealed by a mixture of soil with secreted mucus followed by a quantity of excrement. The number of eggs deposited at one time varies from 30 to 120, averaging 86. (Dekle and Fasulo, 2001).

Frequency of oviposition is subject to temperature, humidity, and soil conditions. Low temperature and low humidity inhibit the activity of the snail, and dry soil is unsuitable for the preparation of a nest. During warm damp weather, ovipositions may be as frequent as once a month (February to October). Low humidity and cold temperatures greatly inhibit the activity of the snails during the fall and winter months. During the summer months, the eggs hatch in about two weeks. The shells of hatchlings are fragile and translucent. Maturity requires about two years in southern California (Dekle and Fasulo, 2001).

FOOD HABITS: *Helix aspersa* will feed on organic matter in the soil, bark from trees, algae, lichens, and especially on vegetation (decaying or otherwise). Nearly anything growing in a vegetable or flower garden can be consumed (Dekle and Fasulo, 2001). This species has symbiotic bacteria in their crop that enables them to digest cellulose and have been known to feed on damp paper and cardboard (BBC, 2004). There are a large variety of host plants, which include trees, shrubs, vegetables, cereals, and flowers. According to Capinera (2001), as cited by Dekle and Fasulo (2001), they normally feed within the temperature range of 5 to 21 ºC. They feed by scraping a ribbon-like tongue covered in horny teeth called a radula, over their food.

HABITAT: The habitat of the Brown garden snail is widely varied. They are often found in gardens, parks, forests and dunes. They prefer an undisturbed habitat with adequate moisture and a good food supply. (BBC, 2004). Often common in irrigated gardens and nurseries in Arizona.

ELEVATION:

PLANT COMMUNITY: A variety of trees, plants, shrubs, and flowers.

POPULATION TRENDS: This species a serious threat to crops and groves in California and the Pacific Northwest. *Helix aspersa* populations have the potential to grow at alarming rates.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None
STATE STATUS: None
OTHER STATUS: None

MANAGEMENT FACTORS: This snail is an exotic, nuisance species. Detection signs include holes in fruit and ragged holes chewed in leaves, with large veins remaining. Slime trails and excrement on plant material. Management of the brown garden snail is a four-step process that involves pruning tree skirts; banding tree trunks with copper foil or a basic copper sulfate slurry; putting out poison bait to reduce their populations; and making releases of the predatory decollate snail, *Rumina decollata*. Habitat reduction will aid in control. Remove anything snails may hide under: boards, bags, brush, and debris. During the night, place a board on the ground near damaged plants. Elevate the board with four stones near the corners. The snails will take shelter under the board in the morning and can be removed and then destroyed by dropping them in a jar filled with water and a little rubbing alcohol. Some birds, especially ducks, will feed on these snails. Barriers of diatomaceous earth, sand, or ashes provide only temporary control. With a beer trap the goal is to trap and drown the snails and slugs in a shallow dish of beer placed slightly below the grade so that the lip of the dish is even with the soil. However, this does not provide reliable control. (Dekle and Fasulo 2001).

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS:

LAND MANAGEMENT/OWNERSHIP:

SOURCES OF FURTHER INFORMATION

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MAJOR KNOWLEDGEABLE INDIVIDUALS:

ADDITIONAL INFORMATION: Due to the brown garden snail, various states in the United States have quarantine restrictions concerning plant materials brought in from other states. The states under quarantine include Arizona, California, Louisiana, Oregon, South Carolina and Washington (Dekle and Fasulo 2001).

First state record of this species was from Tucson by A.R. Mead in 1951.

This snail has been disseminated into many parts of the world intentionally as a food delicacy, accidentally by the movement of plants, and by hobbyists who collect snails. It was introduced to California in the 1850s as a source of escargot. It has adapted well to California and is very troublesome as a pest of crops and ornamentals.

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