Summary of a Survey of Water Garden Owners in Canada

D. Marson[1], B. Cudmore[1], D.A.R. Drake[2], and N.E. Mandrak[1]

[1]Central and Arctic Region
Fisheries and Oceans Canada
Burlington, ON L7R 4A6

[2]University of Toronto

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D. Marson, B. Cudmore, D.A.R. Drake, and N.E. Mandrak

Fisheries and Oceans Canada
Centre of Expertise for Aquatic Risk Assessment
P.O. Box 5050, 867 Lakeshore Road
Burlington, Ontario
L7R 4A6

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The “Great Canadian Water Garden Survey” was led by the Ontario Federation of Anglers and Hunters (OFAH) along with partner organizations, both as an online and paper questionnaire to determine the origin and fate of aquatic invasive species in the water garden trade. A total of 752 surveys were completed, of which 359 respondents (48%) indicated they had a water garden. In the survey was a list of water garden plant and animal species used by respondents, including eight aquatic invasive plant species and two aquatic invasive animal species, all of which were added to water gardens by multiple respondents. Analyses of the purchase locations and water garden locations indicated relatively small mean travel distances (mean Euclidean distances were 39.49 km for plants and 33.52 km for animals), but were notable for high variability and extreme right-skewness signifying rare, long-distance travel distances within both the plant and animal surveys. The survey results indicate that the water garden trade should not be overlooked as a vector for aquatic invasive species into Canadian freshwaters.

RÉSUMÉ

Marson, D., B. Cudmore, D.A.R. Drake, and N.E. Mandrak. 2009. Summary of a survey of water garden owners in Canada. Can. Manuscr. Rep. Fish. Aquat. Sci. 2906: v + 23 p.

Afin de déterminer l’origine et le sort des espèces aquatiques envahissantes (EAE) dans le commerce des espèces destinées aux jardins d’eau, la Fédération ontarienne des pêcheurs à la ligne et des chasseurs (Ontario Federation of Anglers and Hunters – OFAH), de pair avec d’autres organismes partenaires, a mené un grand sondage canadien sur les jardins d’eau à l’aide d’un questionnaire en ligne et sur papier. Sur un total de 752 répondants, 359 (48 %) ont indiqué qu’ils possédaient un jardin d’eau. Parmi la liste des espèces animales et végétales de jardin d’eau que possèdent les répondants, huit espèces végétales aquatiques et deux espèces animales aquatiques sont des espèces envahissantes, et toutes sont utilisées par de nombreux répondants. Les analyses indiquent des distances moyennes de parcours relativement faibles entre le lieu d’achat et l’emplacement des jardins d’eau (la distance euclidienne moyenne est de 39,49 km pour les plantes et de 33,52 pour les animaux). Ces analyses révèlent cependant une grande variabilité et une asymétrie positive élevée, ce qui signifie que les espèces végétales et animales en cause sont parfois transportées sur de longues distances. Les résultats du sondage démontrent que le commerce lié aux jardins d’eau ne devrait pas être sous-estimé en tant que porte d’entrée des espèces aquatiques envahissantes dans les eaux douces canadiennes.

INTRODUCTION

Aquatic invasive species (AIS) have been, and will continue to be, introduced into Canadian freshwaters through various vectors including stocking (authorized and unauthorized), canals and water diversions, ballast water, baitfish use, live fish markets, pet stores, and garden centres. An understanding of the relative risk of each of these vectors is essential in prioritizing and directing prevention efforts. Data exist for stocking (OMNR, unpubl. data), canals and diversions (Emery 1981), ballast water (Ricciardi and Rasmussen 1998), and live fish markets (Cudmore and Mandrak 2004, Goodchild 1999, and Rixon et al. 2005), but are poor for baitfish (Goodchild 1999b, Litvak and Mandrak 1993) and pet stores (Rixon et al. 2005) due to limited sample sizes, and are totally lacking for garden centres. The water garden trade has, however, been identified as a potential vector for the introduction of aquatic invasive species (Crossman and Cudmore 1999).

To determine the origin and fate of AIS in various live trade pathways, surveys were conducted by the Ontario Federation of Anglers and Hunters, along with partner organizations (Ontario Ministry of Natural Resources and others), with Fisheries and Oceans Canada providing scientific information. A survey was produced, in both paper and online formats, and marketed to individuals during trade show events most likely to result in the congregation of the targeted market (such as the All About Pets Show, Canada Blooms, and the Spring Fishing Show). Three surveys were developed and specifically directed to aquarium owners, the users of baitfish, and water garden owners. The results of these surveys will be used to contribute information to a risk assessment currently being undertaken on live trade pathways.

The “Great Canadian Water Garden Survey” was developed to determine the origin and fate of aquatic invasive species in the water garden trade. The survey included questions regarding the specific plant and animal species added to the respondent’s water garden, where they were purchased, and what was done with them in the winter. A list of animal and plant species was provided, including eight aquatic invasive plant species: European frogbit (*Hydrocharis morsus-ranae*), fanwort (*Cabomba caroliniana*), floating heart (*Nymphoides peltata*), flowering rush (*Butomus umbellatus*), parrot's feather (*Myriophyllum aquaticum*), water fern (*Salvinia minima*), water hyacinth (*Eichhornia crassipes*), water lettuce (*Pistia stratiotes*); and two aquatic invasive fish species Common Carp (*Cyprinus carpio*) and Goldfish (*Carrasius auratus*). Surveys were limited to 20 questions per water garden (i.e. if the recipient of the survey had multiple water gardens, they were asked to answer the 20 questions for each water garden).

MATERIALS AND METHODS

The “Great Canadian Water Garden Survey” was produced as an online and paper questionnaire. Both forms of the survey were made available during trade shows and the online version of the survey was developed using SurveyMonkey (www.surveymonkey.com). The survey was comprised of 20 questions, most of which

were of multiple choice format (see Appendix 1 for the complete survey). The survey consisted of questions regarding the size of water garden, types of plants and animals added, where they were purchased (or collected), how they were maintained through the winter, and how they were disposed of. The intention was to create a survey that was succinct so that individuals would complete it, while providing as much relevant detail as possible for informing the risk assessment. Each survey required approximately 10 minutes to complete.

The survey was first distributed to Ontario recipients at the Canada Blooms flower and garden festival, March 8-12, 2006. Both paper and online versions of the survey were provided in a trade show booth designed specifically for survey respondents. Individuals who were unable to complete the survey at the trade show booth were provided with information (promotional material including fridge magnets, mouse pads, and pens-, that advertised the survey and included the website address) on how to access the website and paper copies were distributed to those preferring that format. Completed paper copies of the survey were subsequently entered into the online database for analysis.

Following the Canada Blooms flower and garden festival, the survey was advertised at additional trade shows, in several magazines, and online through various partner organizations involved in the water garden trade.

RESULTS

NUMBER OF SURVEYS COMPLETED

A total of 752 online and paper surveys were completed. Of those completed, 28 respondents indicated that they had more than one water garden and answered the 20 questions a second time according to the characteristics of their second water garden. While many of the questions were mandatory to complete in order to proceed to the next question in the survey, several were not properly filled in, therefore, the sample size varies between questions. Of the 752 surveys taken, 674 (90%) were answered to completion, however, a total of 121 respondents (25% of those surveyed) did not own a water garden, eliminating further responses throughout the bulk of the survey. In addition, a large percentage of respondents failed to provide responses to certain questions, including 271 respondents who skipped answering whether or not they owned a water garden.

Many of the questions had multiple answers from the respondents (i.e. plants/animals purchased from multiple locations, some plants/animals were left in the water garden while others were removed, etc.) leading to cumulative totals of answers being greater than the total number of respondents for some questions.

The survey results provide information on a variety of water garden related questions, including the size of water gardens, the types of plants and animals added, where the plants and animals were acquired, and what was done with the plants and animals

during the winter.

SIZE DISTRIBUTION OF WATER GARDEN

Of the 752 surveys taken, 359 respondents (48%) indicated they had a water garden. Of the 359 respondents who indicated they had a water garden, 348 indicated the size of their water gardens. An additional 28 respondents indicated having a second water garden and the information gathered from the second water garden was added to the total numbers for the remainder of the analyses. Water gardens were most often either 1-3 m^2 in size (35%) or 3-5 m² (29%) but some respondents own water gardens in excess of 5 m² (21%) or less than 1 m² (15%). The distribution of water garden sizes is shown in Fig. 1.

ORIGIN AND TYPE OF SPECIES USED IN WATER GARDENS

The selection of plants added to water gardens was the focus of the next five questions in the survey. Plants were divided into five groups: surfacing, free-floating, oxygenating, marginal and emergent, and rushes. A variety of species was listed for each category, as well as the opportunity for respondents to manually add other species/varieties to the list that was provided. Respondents frequently entered plant species in the "other" category that were listed in the following questions (84% of "other" entries in the surfacing plant question were species that were listed in the following questions)--respondents also used the "other" category to write out the scientific name for species (30% of the "other" answers to the question regarding the use of oxygenation plants were individuals entering the genus *Elodea* for pondweed). Some respondents indicated they did not know the names of the species or that they were not using any of the species listed (27% of "other" answers to the oxygenating plant selection indicated not knowing the name of species used, or not planting any of the species). The most popular plants in each group were lilies (surfacing), water hyacinth, water lettuce and duckweed (free floating), hornwort (oxygenating), irises, marsh marigold, arrowhead and cattails (marginal and emergent), and bulrush and pickerelweed in the rushes category (Figs. 2-6).

Following the questions on what types of plants were added to the water garden were questions on what type of store they were purchased from and the purchase location (city, province). Nearly 79% of the respondents purchased one or more plants from a garden centre or nursery. Plants were also often acquired from friends (31%) or taken from the wild (31%, Fig. 7). The total of the percentages is greater than 100 since several respondents acquired plants from multiple locations.

There were a total of 301 locations submitted by the respondents with regards to where the plants were acquired. While plants can be ordered by Internet or mail order, very few respondents purchased plants in this manner (n = 13).

Water garden plants were most often left in the water garden over the winter (75%). However, plants were also brought indoors (41%) or either thrown in the garbage or

composted (49%, Fig. 8).

Of those surveyed, 304 indicated that animals were added to the water gardens. The most commonly added animals include Goldfish (72%), koi (a variety of Common Carp) (33%), as well as frogs/tadpoles (37%) and snails (39%), of which the latter two groups generally arrived naturally or as accompaniments to plants added to the water garden (Fig. 9). While it was indicated that some of the animals arrived naturally or were collected from the wild (n = 61), most were purchased from either a pet store (n = 168) or garden centre (n = 155, Fig. 10). A total of 257 locations were given by respondents regarding the purchase location of water garden animals. Water garden animals were most often left in the water garden through the winter (74%), however, 34% were brought indoors, 3% were released into the wild, and 1% were thrown into the garbage or composted (Fig. 11).

DISTANCE PLANTS AND ANIMALS ARE TRANSFERRED FROM PURCHASE LOCATION TO RESPONDENTS' WATER GARDEN LOCATIONS

Spatial analyses were performed to determine the distances that plants and animals were transferred following their acquisition. The data was first sorted for useable origins (i.e. purchase locations) and destinations (i.e. water garden locations). Several postal codes (signifying water garden locations) were unusable due to missing or inaccurate digits. Additionally, many purchase locations were generic and could not be reliably determined. Therefore, missing or incomplete data were excluded from subsequent analysis. Following data sorting for quality, 298 responses within the plant survey and 223 responses within the animal survey were suitable for tracking vector movement. Of those who responded with suitable data to track vector movement, plants and animals were tracked separately and water garden locations were estimated using the provided postal codes. Of the respondents who provided suitable data with regards to water garden location and plant/animal purchase locations, 87 plant and 73 animal purchase locations were located in the greater Toronto area (Canadian postal unit 'L'), 61 plant and 53 animal purchase locations were located in southwestern Ontario (Canadian postal unit 'N'), 26 plant and 20 animal purchase locations were located in downtown Toronto (Canadian postal unit 'M'), 20 plant and 17 animals purchase locations were located in eastern Ontario (Canadian postal unit 'K'), and 7 plant and 5 animal purchase locations were located in northern Ontario (Canadian postal unit 'P'). Because respondents may purchase plants and animals from multiple locations but transport them to a single water garden location, the total number of responses providing suitable plant/animal movement data (n = 298 for plant and 223 for animal) is larger than the actual number of respondents (n = 201 for plant and 168 for animal) who provided vector movement data.

Vector movement for each respondent was determined using a Geographic Information System (ArcGIS 9.3) and spatially-explicit postal code and provincial city/town data to describe spatial interaction between origins and destinations. To determine Euclidean distance, each respondent's origin (purchase location) was plotted, followed by his or her final destination (water garden location). Euclidean distances (km) were calculated

as the shortest linear distance between each origin and destination (Figs. 12 and 13). Although Euclidean distances provide reasonable approximations for vector movement, they may underestimate actual distances travelled due to the complexity of many road networks.

Euclidean distance is displayed using an error bar plot displaying 95% confidence intervals (Fig. 14) and a box plot (Fig. 15). Results were characterized by relatively small mean travel distances (mean Euclidean distances were 39.49 km for plants and 33.52 km for animals), but were notable for high variability and extreme right-skewness signifying rare, long-distance travel distances within both the plant and animal surveys.

DISCUSSION

One of the primary objectives of the water garden survey was to determine the extent to which AIS were introduced into water gardens in Canada. Of the aquatic plants listed in the online survey, eight are noted as either invasive or posing significant threat as a potential invasive species. These include European frogbit (*Hydrocharis morsus-ranae*), fanwort (*Cabomba caroliniana*), floating heart (*Nymphoides peltata*), flowering rush (*Butomus umbellatus*), parrot's feather (*Myriophyllum aquaticum*), water fern (*Salvinia minima*), water hyacinth (*Eichhornia crassipes*), and water lettuce (*Pistia stratiotes*; Table 1). The aquatic invasive plant species identified in this study share several characteristics including rapid and dense growth, reduction of light penetration, altering of the physical and chemical characteristics of the waterbodies they invade, and the displacement of native plants that provide food and habitat for native species (global invasive species database www.issg.org/database; MNR/OFAH invading species awareness program www.invadingspecies.com).

The list of aquatic animals in the survey includes two invasive fish species, the Common Carp (including koi) and Goldfish (including ryukins). These species also share several characteristics detrimental to native habitats such as the bottom-sucking feeding habits which result in the suspension of sediment causing increased turbidity of the water, the destruction of rooted aquatic plants, and the reduction of macroinvertebrates through predation and habitat loss (global invasive species database, MNR/OFAH invading species awareness program). Both Common Carp and Goldfish act as competitors for benthic food resources with native fish and have also been found to feed on native fish eggs and fry (MNR/OFAH invading species awareness program).

Known aquatic invasive species are listed on the Global Invasive Species Database (http://www.issg.org/database) that includes both water garden plants and animals and is regularly updated to include newly introduced species and those that will pose a greater risk with climate warming (Crossman and Cudmore 1999). Therefore, with updates additional species noted in this survey may be listed as invasive species in the near future. All of the invasive plant species listed in the survey were identified as species that had been planted in the water garden of a least one respondent. Floating heart, parrot's feather, water fern, and water lettuce were frequently identified as species planted in water gardens (Table 1). The use of aquatic invasive fishes, such as

Common Carp (koi) and Goldfish, was also common among water garden respondents (Fig. 9, Table 1). During the analyses of the data it became evident that in the case of frogs, snails, turtles and others, respondents were documenting animals arriving naturally and did not appear to be intentionally introducing these types of animals into their water gardens.

While the use of AIS in water gardens does not automatically result in the introduction of the AIS into the wild, it is important to realize that these species pose a threat if they are transferred, be it intentionally or not, to ecosystems free of the AIS species. In addition, aquatic plant and animal species can be unintentionally spread to adjacent water bodies during flood events, which would most likely occur in instances where plants/animals are left in the water garden through the winter and, therefore, would be subject to the threat of spring flooding (>75% of water garden owners left both plants and animals in the water garden through the winter, Figs. 8 and 11). Though determining how many of the respondents' water gardens are located in flood-prone areas is difficult; there exists baseline risk posed by the large proportion of water garden owners that overwinter their plants and animals.

The transfer of AIS, from purchase location to pond, is also of particular concern given the likelihood of spread and subsequent establishment, should a release occur. It was noted in the analyses of plant transfer distances (movement vectors) that the mean transfer distances were relatively small (<40 km from point of purchase). Some purchases, however, were transported considerably farther (maximum Euclidean distances were 508 km for plants and 432 km for animals), indicating that AIS are transported and introduced to water garden locations far from their source (point of purchase). Given the risk posed by potential long distance transport, the propensity for water garden owners to travel considerable distances from points-of-purchase should be noted in lieu of the future AIS arrival at water garden retailers, and ultimately suggests that AIS spread may not be a localized process. Therefore, should a particularly threatening plant be discovered at a retailer, the potential for the spread may extend far beyond the mean distance of 39.49 km from the point of purchase.

An additional consideration when analyzing the threat of AIS introduction from human movement pathways is that respondents are generally aware that it is ill-advised to release plants and animals into the wild and accordingly, may falsify survey responses rather than disclosing their actual practices.

The "Great Canadian Water Garden Survey" was developed in order to collect information about the practices of water garden owners. The survey has helped to create a better understanding of the plants and animals most often selected for water garden use, as well as the distances travelled between purchase locations and water garden locations. The results of this survey indicate that the water garden trade should not be overlooked as a vector for aquatic invasive species into Canadian freshwaters. Further risk assessment studies of the water garden trade will help to inform the probability of invasive species survival in Canadian ecosystems and the level of disturbance that would be associated with the successful invasion of the aquatic

invasive species introductions from this pathway.

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Table 1. Aquatic Invasive Species (AIS) added to water gardens based on 359 survey respondents with water gardens. Occurrences reflect the number of respondents who indicated that they planted AIS in personal water gardens. AIS information is available at the suggested websites.

Common Name	Scientific Name	# Occurrences	Invasive Species Information
Common Carp/Koi	*Cyprinus carpio*	138	www.issg.org/database www.invadingspecies.com
European Frogbit	*Hydrocharis morsus-ranae*	30	www.invadingspecies.com www.issg.org/database
Fanwort	*Cabomba caroliniana*	34	www.invadingspecies.com www.issg.org/database
Floating heart	*Nymphoides peltata*	104	www.invadingspecies.com www.issg.org/database www.cws-scf.ec.gc.ca
Flowering rush	*Butomus umbellatus*	23	www.invadingspecies.com www.issg.org/database www.cws-scf.ec.gc.ca
Goldfish/ryukins	*Carassius auratus*	288	www.invadingspecies.com www.issg.org/database
Parrot's feather	*Myriophyllum aquaticum*	98	www.invadingspecies.com www.issg.org/database
Water fern	*Salvinia minima*	41	www.invadingspecies.com www.issg.org/database
Water hyacinth	*Eichhornia crassipes*	264	www.invadingspecies.com www.issg.org/database
Water lettuce	*Pistia stratiotes*	206	www.invadingspecies.com www.issg.org/database

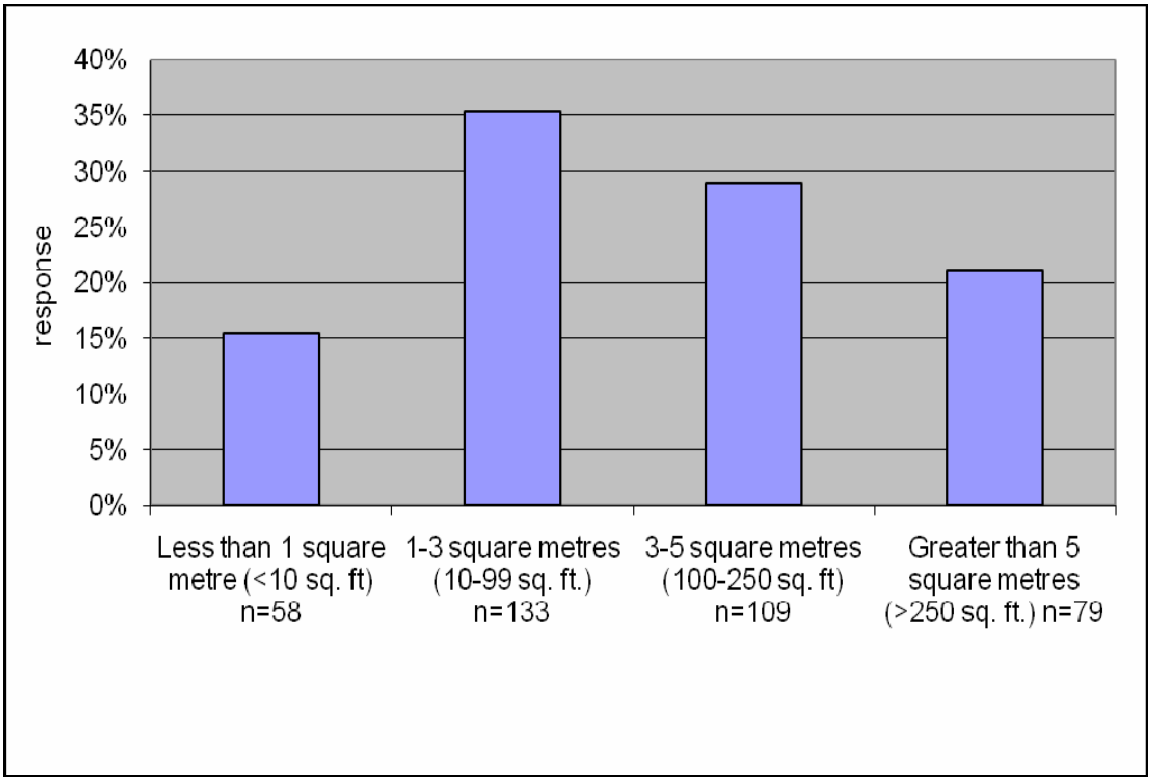

Figure 1. Frequency of responses regarding water garden size.

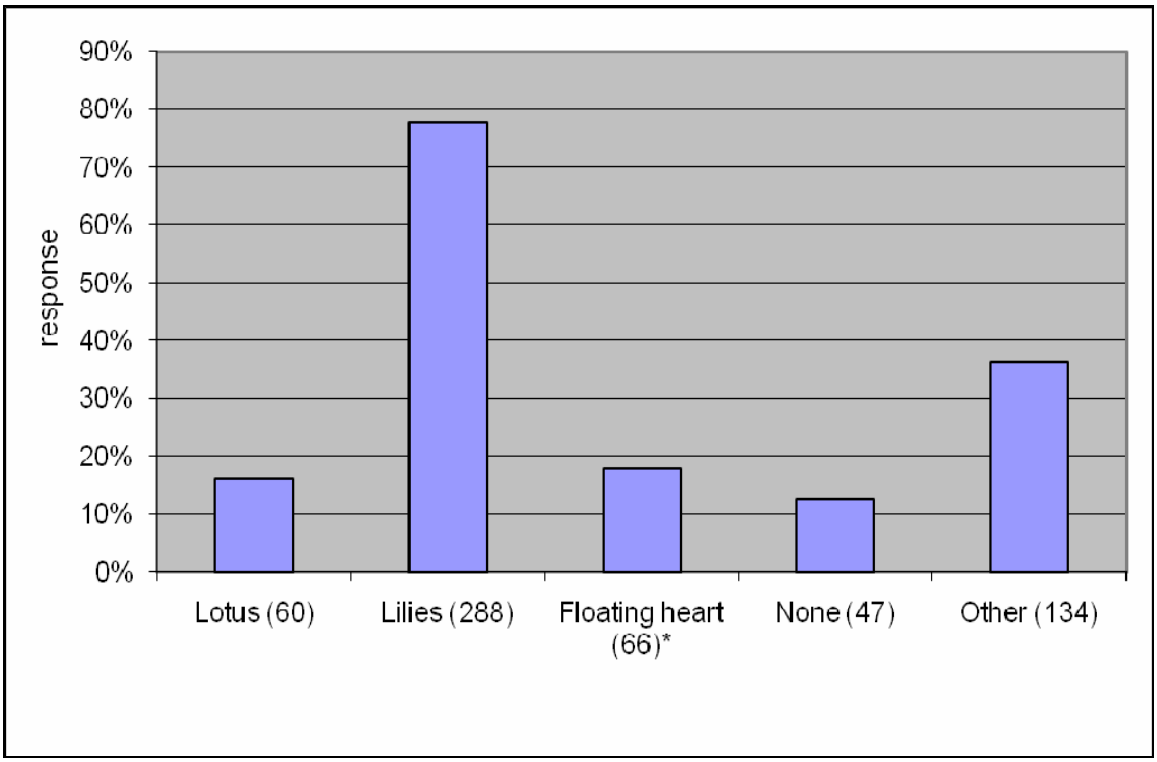

Figure 2. Surfacing plants added to water garden (n). * - Aquatic Invasive Species

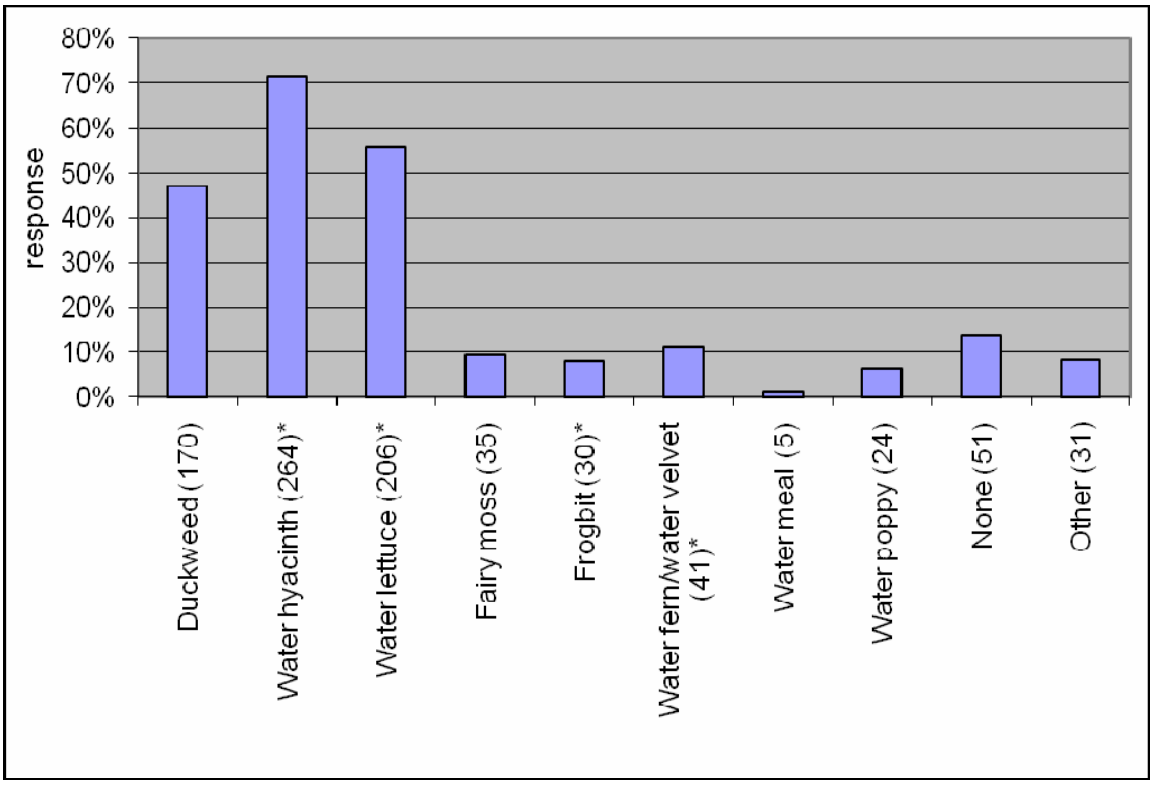

Figure 3. Free-floating plants added to water garden (n). * - Aquatic Invasive Species

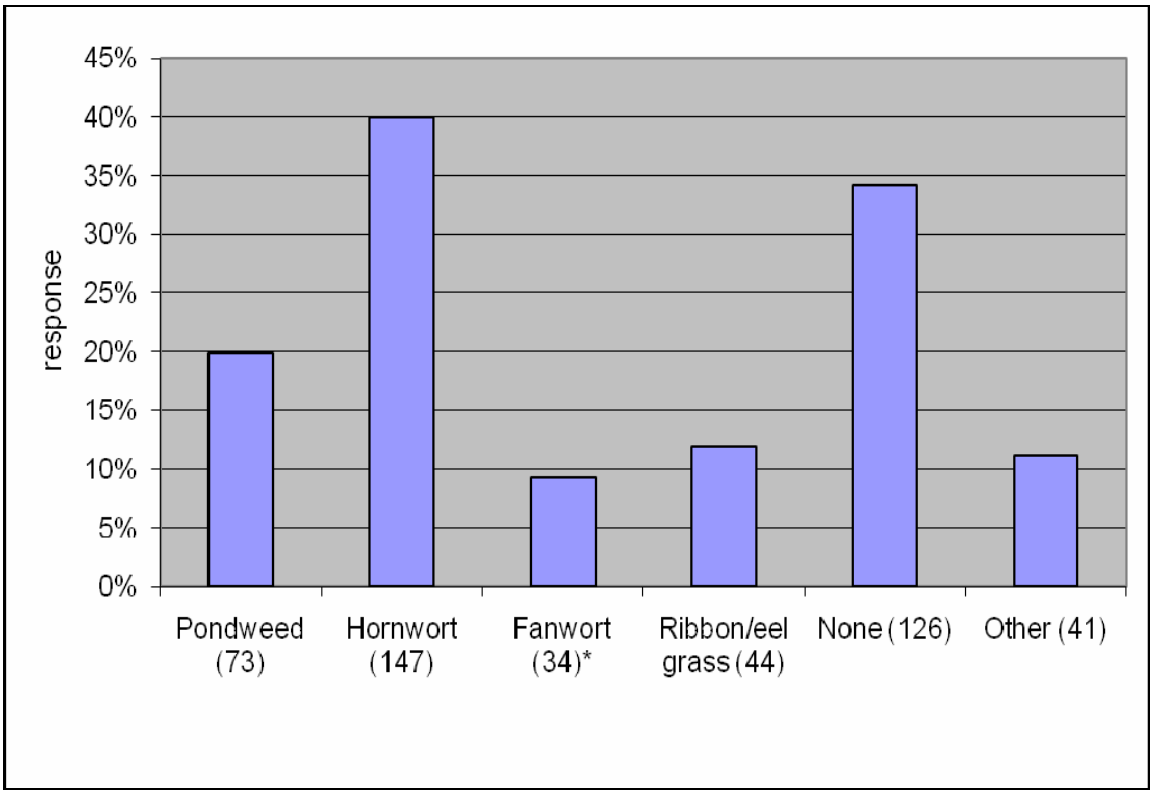

Figure 4. Oxygenating plants added to water garden (n). * - Aquatic Invasive Species

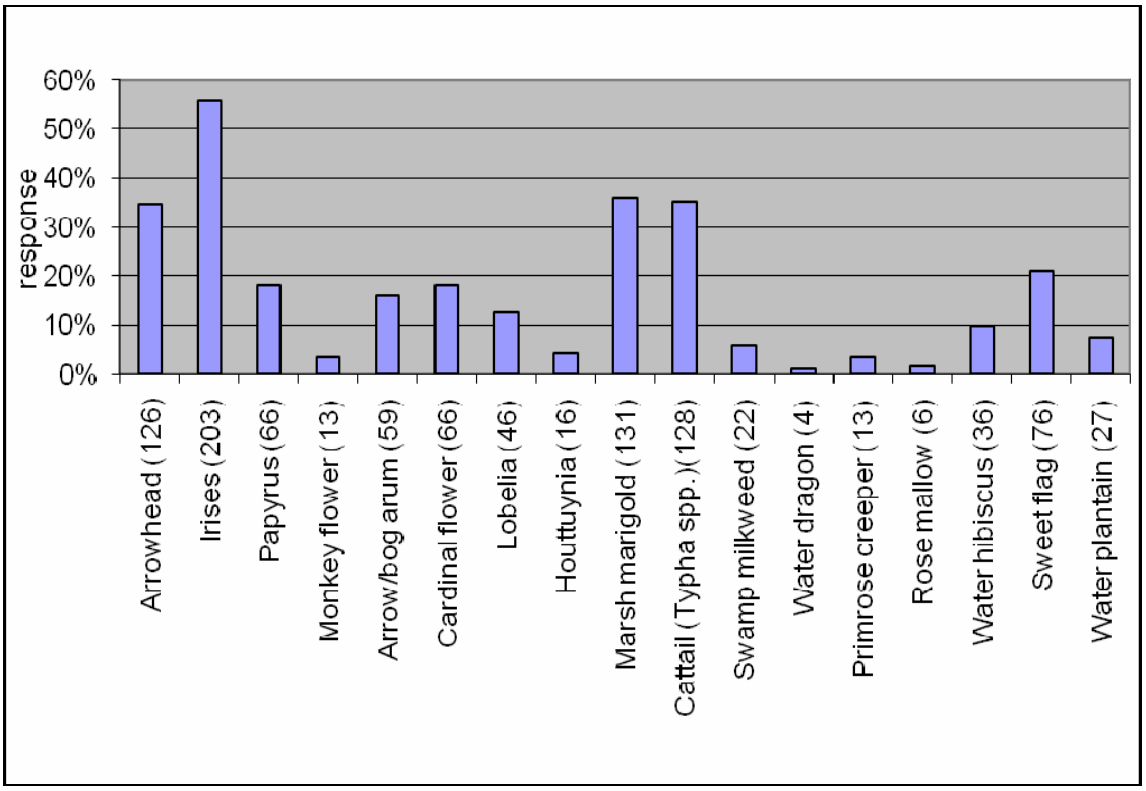

Figure 5a. Marginal and emergent plants added to water garden (n).

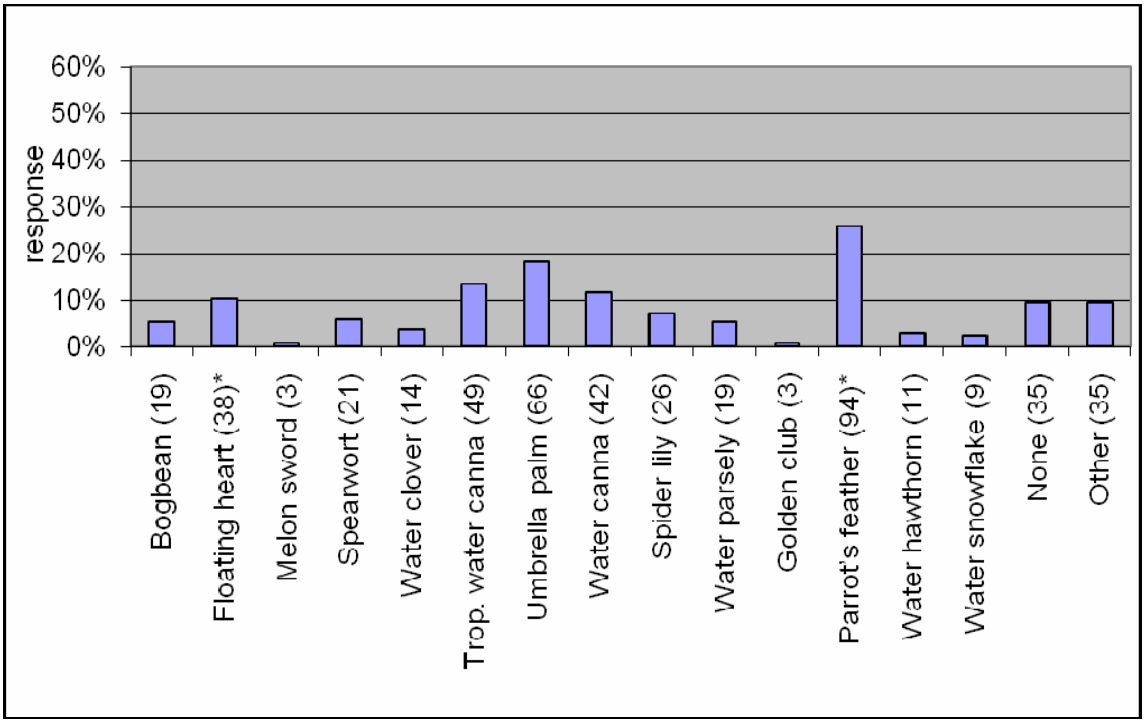

Figure 5b. Marginal and emergent plants added to water garden (n). * - Aquatic Invasive Species

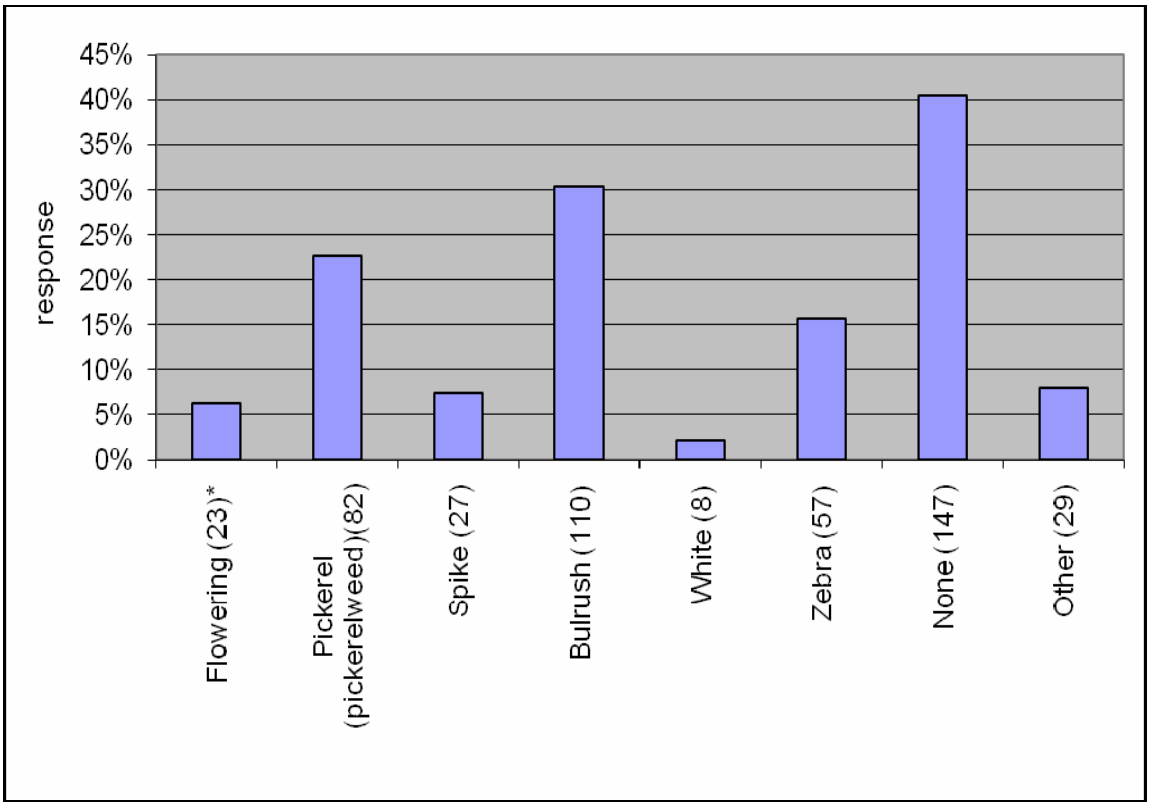

Figure 6. Rushes added to water garden (n). * - Aquatic Invasive Species

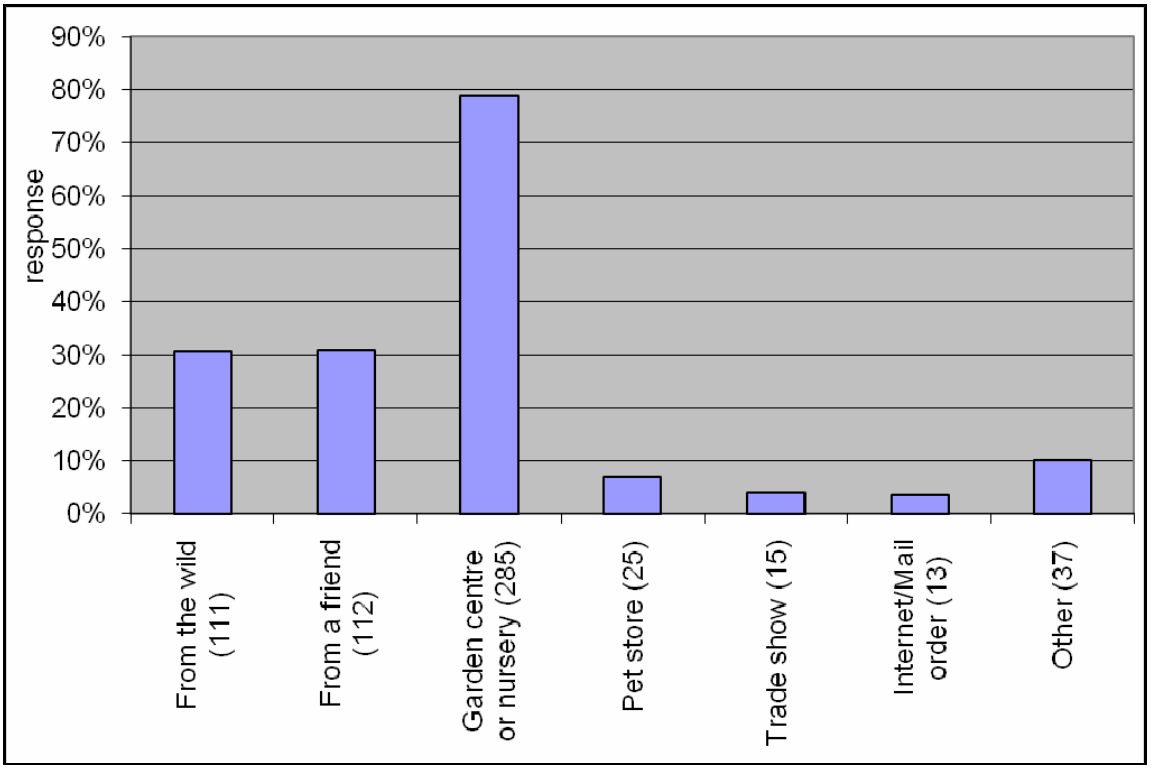

Figure 7. Responses to where water garden plants were acquired (n).

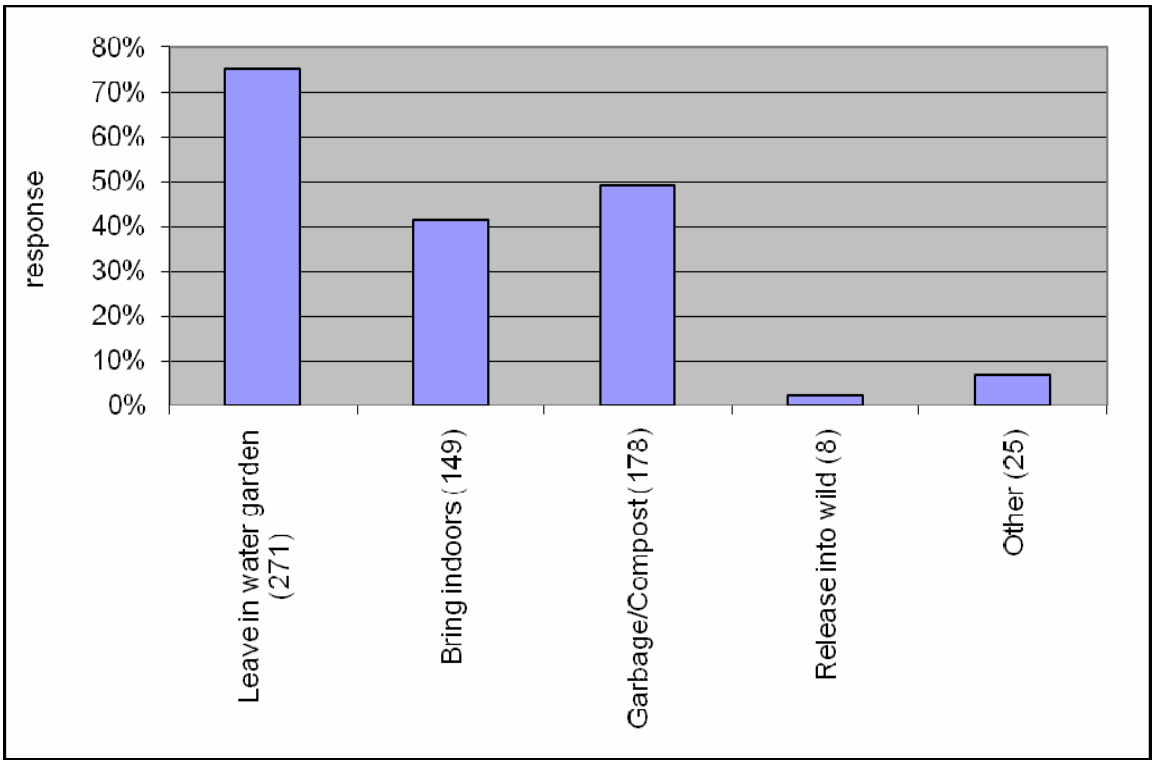

Figure 8. What is done with water garden plants in winter (n).

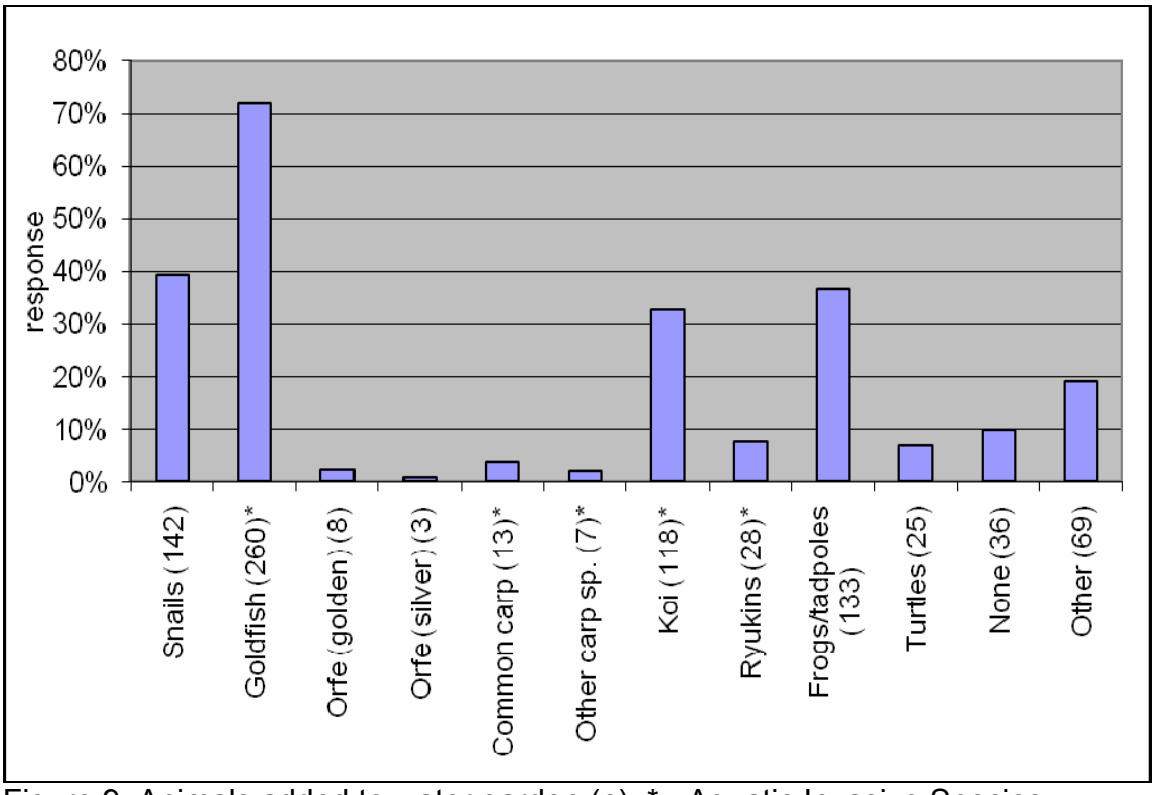

Figure 9. Animals added to water garden (n). * - Aquatic Invasive Species

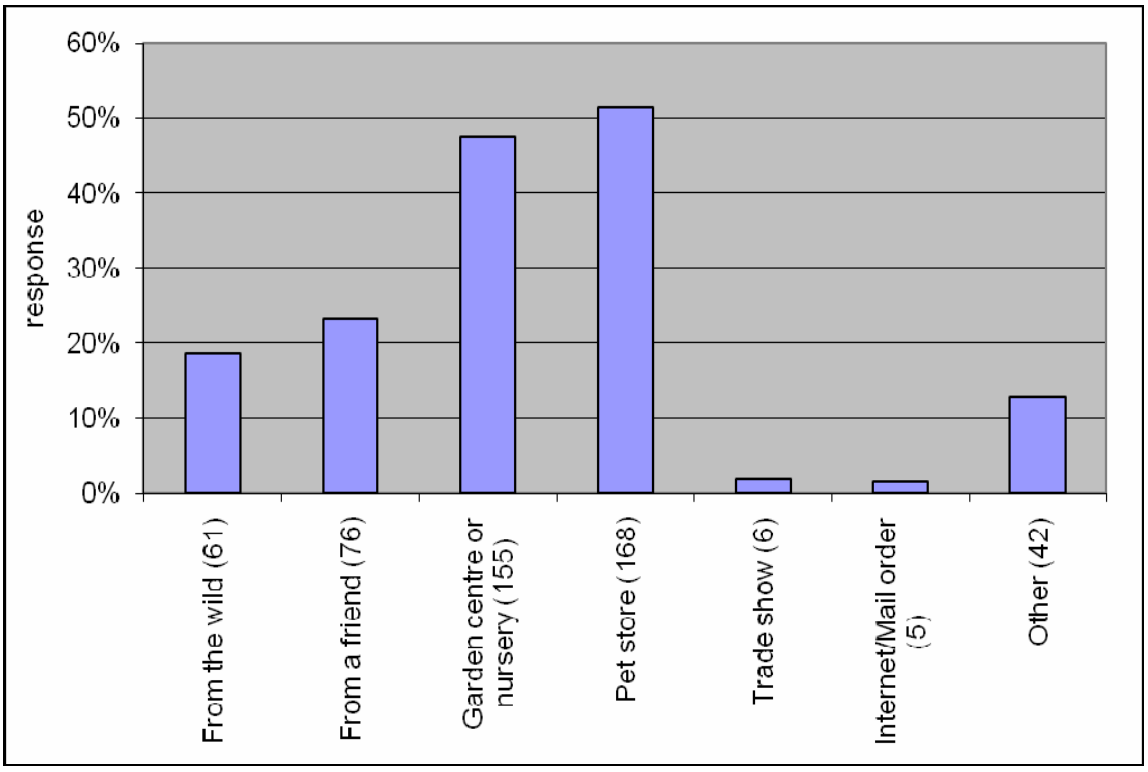

Figure 10. Where water garden animals were acquired (n).

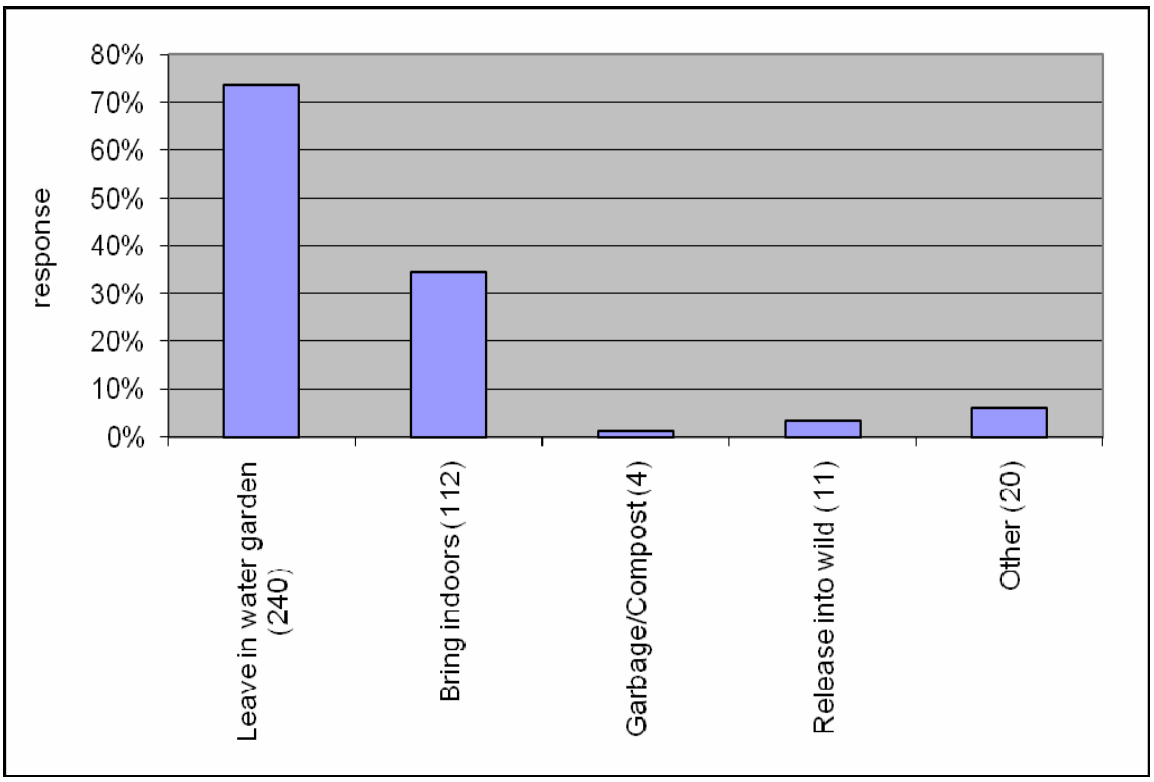

Figure 11. What is done with water garden animals in winter (n).

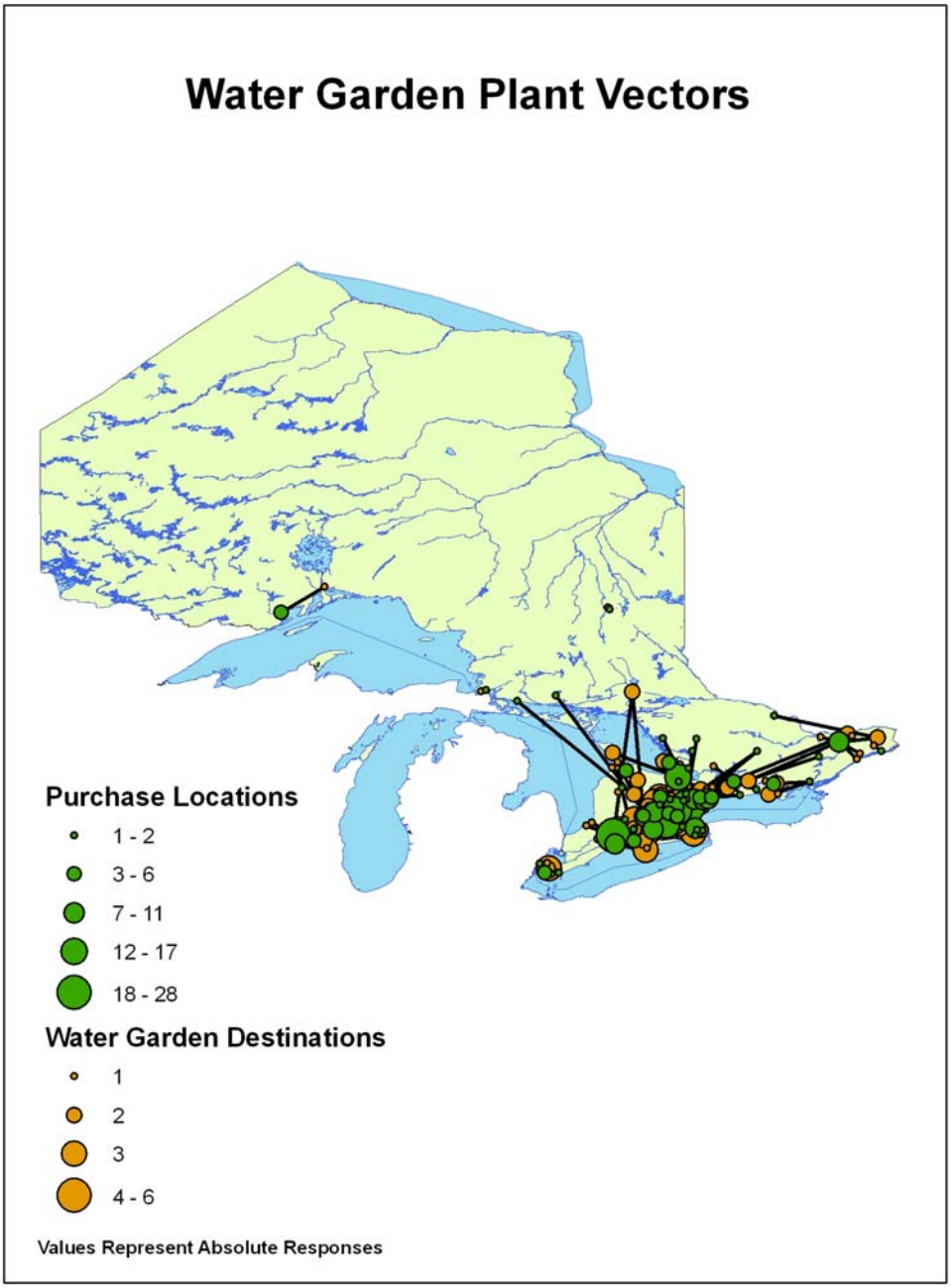

Figure 12. Movement of water garden survey respondents between plant origins (water garden plant retailer location) and destinations (respondent's water garden location). Black lines (—) represent Euclidean travel route for each origin-destination pair.

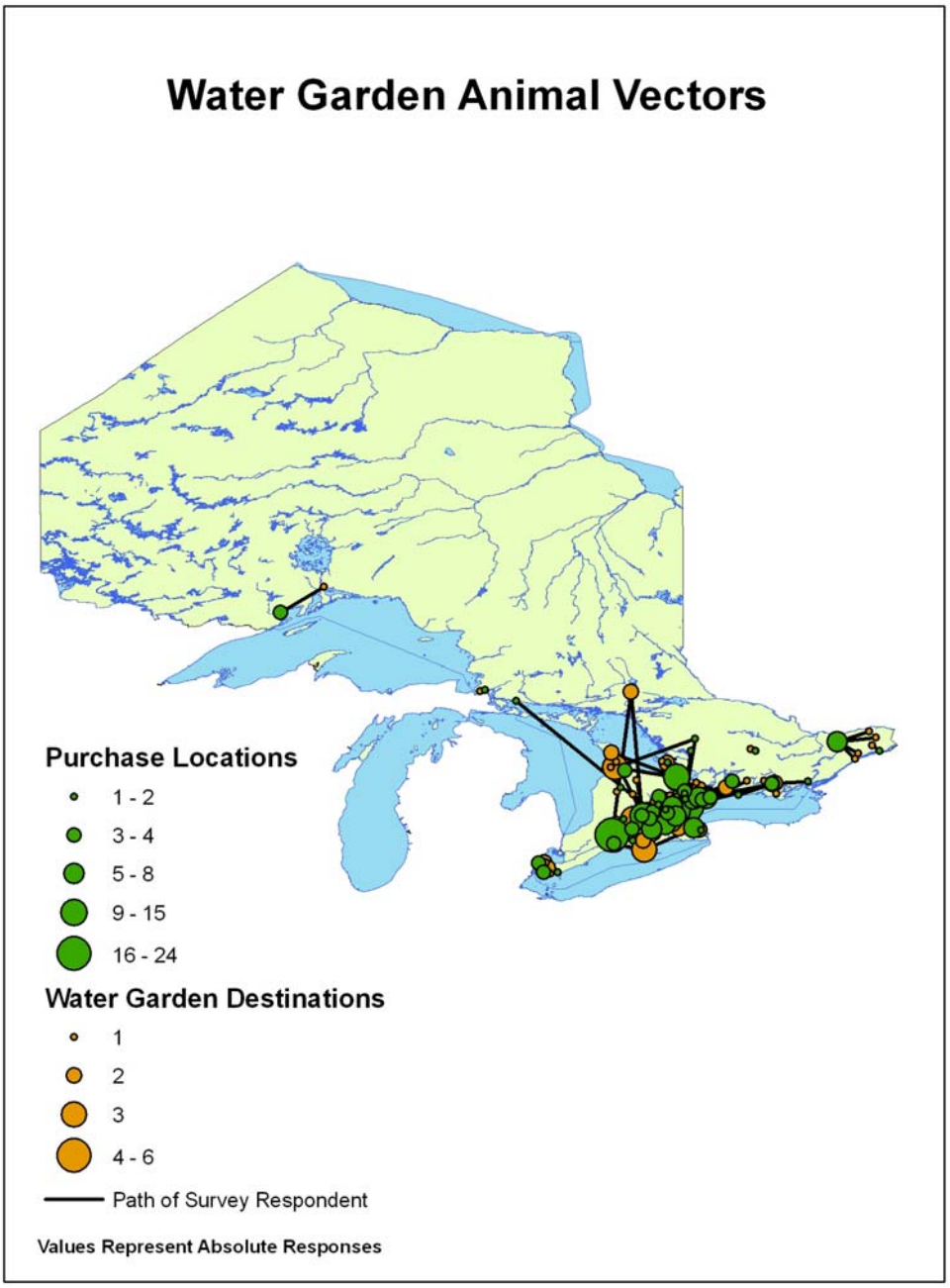

Figure 13. Movement of water garden survey respondents between animal origins (water garden animal retailer location) and destinations (respondent's water garden location). Black lines (—) represent Euclidean travel route for each origin-destination pair.

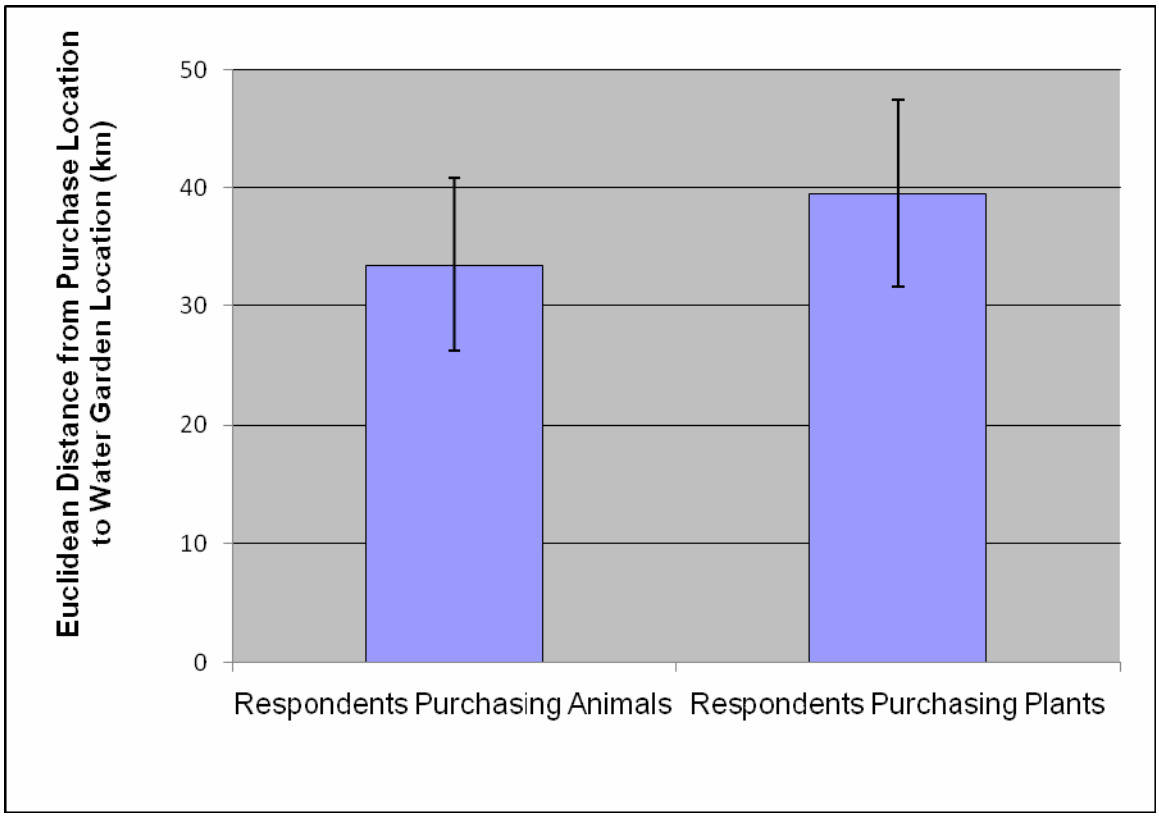

Figure 14. Mean Euclidean distances (and associated 95% confidence intervals) for up to three potential trips per respondent. Distance values represent the shortest possible linear path from origin (purchase location) to destination (water garden location).

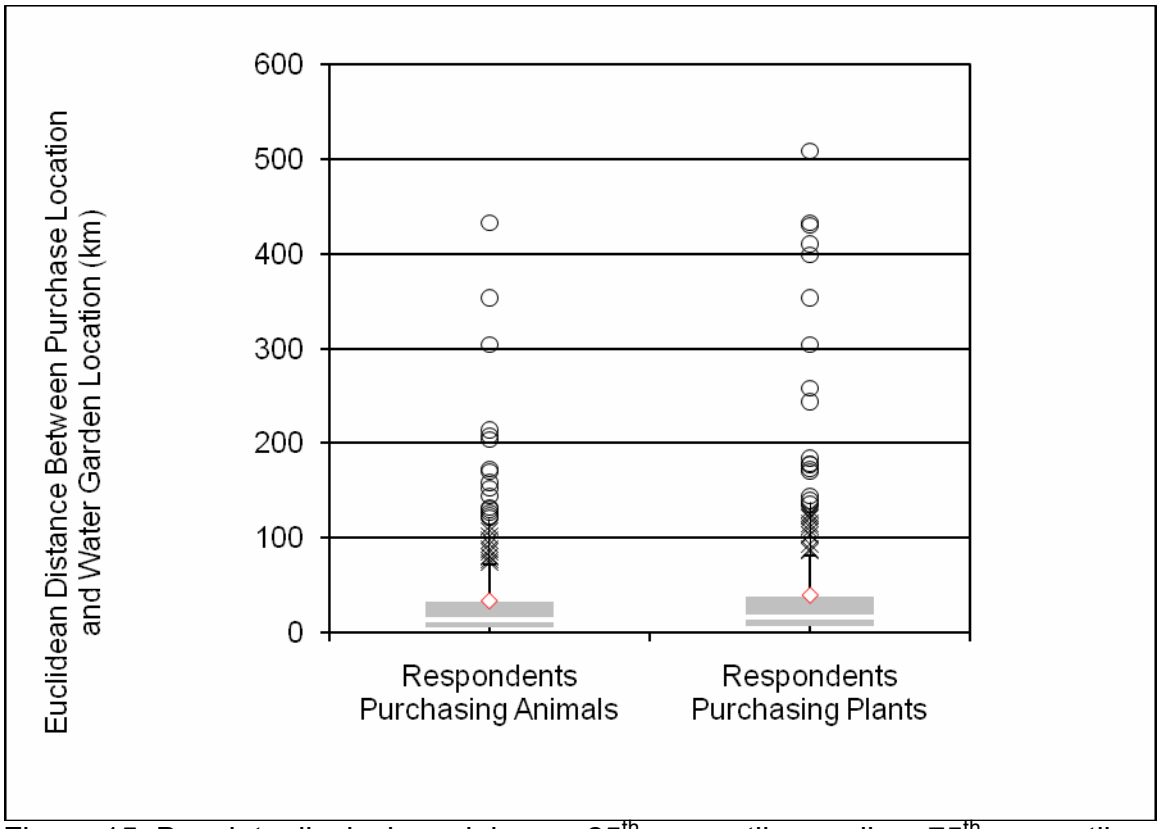

Figure 15. Boxplots displaying minimum, 25th percentile, median, 75th percentile, and maximum values for Euclidean distances for up to three potential trips per respondent. Outlying data (i.e. those outside the first or fourth quartiles) are represented as point based symbols ('X' or 'O'). Distances represent the shortest linear route from origin (purchase location) to destination (water garden location).

APPENDIX 1. The Great Canadian Water Garden Survey.

Welcome to The Great Canadian Water Garden Survey.
The purpose of the survey is to get a better understanding of the plants and animals used by Canadians in their water gardens and ponds.
The survey is divided into two parts.
Part A should be completed by all first time visitors to the survey site.
Part B is a shorter survey to be used after every time that you add plants or animals to your water garden – it is sort of like a water garden logbook.

1. Is this your first time visiting this survey?
   - ❍ Yes
   - ❍ No

2. Please choose a unique username and password. Use the same username and password every time that you fill out Part B. These unique identifiers will be used to track your use of plants and animals in your water garden through the year anonymously. They will in no way be linked to, or reveal, your identity.
Username:
Password:

3. Do you have a water garden?
   - ❍ Yes
   - ❍ No

4. In what postal code is your water garden?

5. How large is your water garden? Choose one.
   - ❑ Less than 1 square metre (<10 sq. ft)
   - ❑ 1-3 square metres (10-99 sq. ft.)
   - ❑ 3-5 square metres (100-250 sq. ft)
   - ❑ Greater than 5 square metres (>250 sq. ft.)

6. What surfacing plants have you put in your water garden? Choose all that apply.
   - ❑ Floating heart
   - ❑ None
   - ❑ Lilies
   - ❑ Lotus
   - ❑ Others (please specify):

7. What free-floating plants have you put in your water garden? Choose all that apply.
   - ❑ None
   - ❑ Water lettuce
   - ❑ Water hyacinth
   - ❑ Fairy moss
   - ❑ Water poppy
   - ❑ Duckweed

- ❑ Frog's bit
- ❑ Water meal
- ❑ Water fern/water velvet
- ❑ Others (please specify):

8. What oxygenating plants have you put in your water garden? Choose all that apply.
- ❑ Fanwort
- ❑ Hornwort
- ❑ Ribbon/eel grass
- ❑ None
- ❑ Pondweed
- ❑ Others (please specify):

9. What marginal or emergent plants have you put in your water garden? Choose all that apply.
- ❑ Water plantain
- ❑ Lobelia
- ❑ Water parsely
- ❑ Bogbean
- ❑ Parrot's feather
- ❑ Tropical water canna
- ❑ Melon sword
- ❑ Primrose creeper
- ❑ Water clover (pepperwort, water shamrock)
- ❑ Houttuynia
- ❑ Arrow/bog arum
- ❑ Water snowflake
- ❑ Water canna (blue fire flag)
- ❑ Spider lily
- ❑ Papyrus
- ❑ Water hibiscus
- ❑ Spearwort (tongue buttercup)
- ❑ None
- ❑ Monkey flower
- ❑ Water hawthorn
- ❑ Swamp milkweed
- ❑ Sweet flag
- ❑ Rose mallow
- ❑ Arrowhead
- ❑ Water dragon
- ❑ Irises
- ❑ Cardinal flower
- ❑ Marsh marigold
- ❑ Cattail (Typha spp.)
- ❑ Golden club
- ❑ Floating heart
- ❑ Umbrella palm

❑ Others (please specify):

10. What rushes have you put in your water garden? Choose all that apply.
- ❑ Bulrush
- ❑ Spike
- ❑ Zebra
- ❑ Flowering
- ❑ None
- ❑ Pickerel (pickerelweed)
- ❑ White
- ❑ Others (please specify):

11. Where did you get your water garden plants? Choose all that apply.
- ❑ Pet store
- ❑ From the wild
- ❑ Internet/Mail order
- ❑ Garden centre or nursery
- ❑ Trade show
- ❑ From a friend
- ❑ Other (please specify)

12. List the top three locations (cities or towns) where you buy/collect your water garden plants.
Location
Province
Location
Province
Location
Province

13. If you purchased your water garden plants by internet or mail order, please provide company name.

14. What do you do with your water garden plants in the winter? Choose all that apply.
- ❑ Garbage/Compost
- ❑ Release into wild
- ❑ Leave in water garden
- ❑ Bring indoors
- ❑ Other (please specify)

15. What animals have you put in your water garden? Choose all that apply.
- ❑ Orfe (golden)
- ❑ Orfe (silver)
- ❑ Common Carp
- ❑ None
- ❑ Other Carp (not Common Carp)
- ❑ Koi

- ❑ Ryukins
- ❑ Turtles
- ❑ Goldfish
- ❑ Snails
- ❑ Frogs/tadpoles
- ❑ Other (please specify)

16. Where did you get your water garden animals? Choose all that apply.
- ❑ Pet store
- ❑ Trade show
- ❑ Garden centre or nursery
- ❑ From the wild
- ❑ Internet/Mail order
- ❑ From a friend
- ❑ Other (please specify)

17. List the top three locations (cities or towns) where you buy/collect your water garden animals.

Location
Province
Location
Province
Location
Province

18. If you purchased your water garden animals by internet or mail order, please provide company name.

19. What do you do with your water garden animals in the winter? Choose all that apply.
- ❑ Leave in water garden
- ❑ Release into wild
- ❑ Bring indoors
- ❑ Garbage/Compost
- ❑ Other (please specify)

20. Do you have a water garden in more than one location (e.g. cottage)?
- ❍ Yes
- ❍ No