NEW YORK
TERRESTRIAL VERTEBRATE INVASIVENESS RANKING FORM

Scientific name: Myocastor coypus
Common names: Nutria, Coypu
Native distribution: Southern South America
Date assessed: 6/27/2013
Assessors: E. Schwartzberg
Reviewers: 
Date Approved: 
Form version date: 12 June 2013

New York Invasiveness Rank: Very High (Relative Maximum Score >80.00)

Distribution and Invasiveness Rank (Obtain from PRISM invasiveness ranking form)

<table>
<thead>
<tr>
<th>Status of this species in each PRISM:</th>
<th>Current Distribution</th>
<th>PRISM Invasiveness Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Adirondack Park Invasive Program</td>
<td>Not Present</td>
<td>Not Assessed</td>
</tr>
<tr>
<td>2 Capital/Mohawk</td>
<td>Not Present</td>
<td>Not Assessed</td>
</tr>
<tr>
<td>3 Catskill Regional Invasive Species Partnership</td>
<td>Not Present</td>
<td>Not Assessed</td>
</tr>
<tr>
<td>4 Finger Lakes</td>
<td>Not Present</td>
<td>Not Assessed</td>
</tr>
<tr>
<td>5 Long Island Invasive Species Management Area</td>
<td>Not Present</td>
<td>Not Assessed</td>
</tr>
<tr>
<td>6 Lower Hudson</td>
<td>Unknown</td>
<td>Not Assessed</td>
</tr>
<tr>
<td>7 Saint Lawrence/Eastern Lake Ontario</td>
<td>Not Present</td>
<td>Not Assessed</td>
</tr>
<tr>
<td>8 Western New York</td>
<td>Not Present</td>
<td>Not Assessed</td>
</tr>
</tbody>
</table>

Invasiveness Ranking Summary

<table>
<thead>
<tr>
<th>Invasiveness Ranking Summary</th>
<th>Total (Total Answered*)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Ecological impact</td>
<td>30 (30)</td>
<td>30</td>
</tr>
<tr>
<td>2 Biological characteristic and dispersal ability</td>
<td>30 (30)</td>
<td>24</td>
</tr>
<tr>
<td>3 Ecological amplitude and distribution</td>
<td>30 (30)</td>
<td>21</td>
</tr>
<tr>
<td>4 Difficulty of control</td>
<td>10 (10)</td>
<td>6</td>
</tr>
<tr>
<td>Outcome score</td>
<td>100 (100)^a</td>
<td>81(^a)</td>
</tr>
<tr>
<td>Relative maximum score (^\dagger)</td>
<td></td>
<td>81.00</td>
</tr>
<tr>
<td>New York Invasiveness Rank (^\S)</td>
<td></td>
<td>Very High (Relative Maximum Score &gt;80.00)</td>
</tr>
</tbody>
</table>

* For questions answered “unknown” do not include point value in “Total Answered Points Possible.” If “Total Answered Points Possible” is less than 70.00 points, then the overall invasive rank should be listed as “Unknown.”
\(^\dagger\)Calculated as 100(a/b) to two decimal places.
\(^\S\)Very High >80.00; High 70.00–80.00; Moderate 50.00–69.99; Low 40.00–49.99; Insignificant <40.00

A. DISTRIBUTION (KNOWN/POTENTIAL): Summarized from individual PRISM forms

| A1.1. Has this species been documented in NY? (reliable source; voucher not required) |
|-----------------------------------------------|----------------------------------|
| ☒ Yes – continue to A1.2                     | No – continue to A2.1; Yes [NA]; Yes [USA] |

| A1.2. In which PRISMS is it known (see inset map)? |
|-----------------------------------------------|----------------------------------|
| ☐ Adirondack Park Invasive Program            |                                  |
| ☐ Capital/Mohawk                              |                                  |
| ☐ Catskill Regional Invasive Species Partnership |                                  |
| ☐ Finger Lakes                                |                                  |
| ☐ Long Island Invasive Species Management Area |                                  |
| ☒ Lower Hudson                                |                                  |
| ☐ Saint Lawrence/Eastern Lake Ontario        |                                  |

![Map of New York showing distribution of species]
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Western New York

Documentation:
Sources of information:
One record from New York (Lower Hudson PRISM) in 1989. (Fuller 2013).

A2.0. Is this species listed on the Federal Injurious Fish and Wildlife list?
☒ Yes – the species will automatically be listed as Prohibited, no further assessment required
☒ No – continue to A2.1

A2.1. What is the likelihood that this species will occur and persist given the climate in the following PRISMs?
(Obtain from PRISM invasiveness ranking form and/or Climatch score)
Very Likely Adirondack Park Invasive Program
Very Likely Capital/Mohawk
Very Likely Catskill Regional Invasive Species Partnership
Very Likely Finger Lakes
Very Likely Long Island Invasive Species Management Area
Very Likely Lower Hudson
Very Likely Saint Lawrence/Eastern Lake Ontario
Very Likely Western New York

Documentation:
Sources of information (e.g.: distribution models, literature, expert opinions):
Nutria has been introduced into every continent with the exception of Antarctica and Australia (Carter and Leonard 2002).

If the species does not occur and is not likely to survive and reproduce within any of the PRISMs, then stop here as there is no need to assess the species.

A2.2. What is the current distribution of the species in each PRISM? (Obtain rank from PRISM invasiveness ranking forms)

Distribution
Adirondack Park Invasive Program Not Assessed
Capital/Mohawk Not Assessed
Catskill Regional Invasive Species Partnership Not Assessed
Finger Lakes Not Assessed
Long Island Invasive Species Management Area Not Assessed
Lower Hudson Not Assessed
Saint Lawrence/Eastern Lake Ontario Not Assessed
Western New York Not Assessed

Documentation:
Sources of information:

A2.3. Describe the potential or known suitable habitats within New York. Natural habitats include all habitats not under active human management. Managed habitats are indicated with an asterisk.

Aquatic Habitats
☐ Marine
☒ Salt/brackish waters
☐ Freshwater tidal
☐ Rivers/streams
☒ Natural lakes and ponds
☐ Vernal pools
☒ Reservoirs/impoundments*

Wetland Habitats
☒ Salt/brackish marshes
☐ Freshwater marshes
☐ Peatlands
☐ Shrub swamps
☐ Forested wetlands/riparian
☒ Ditches*
☐ Beaches/or coastal dunes

Upland Habitats
☐ Cultivated*
☐ Grasslands/old fields
☐ Shrublands
☐ Forests/woodlands
☐ Alpine
☐ Roadside*
☐ Cultural*

Other potential or known suitable habitats within New York:

Documentation:
Sources of information:
B. INVASIVENESS RANKING

1. ECOLOGICAL IMPACT

1.1. Impact on Ecosystem Processes and System-wide Parameters (e.g., energy cycle, nutrient and mineral dynamics, light availability, or geomorphological changes (erosion and sedimentation rates).

A. No perceivable impact on ecosystem processes based on research studies, or the absence of impact information if a species is widespread (>10 occurrences in minimally managed areas), has been well-studied (>10 reports/publications), and has been present in the northeast for >100 years. Score: 0

B. Influences ecosystem processes to a minor degree, has a perceivable but mild influence. Score: 3

C. Significant alteration of ecosystem processes. Score: 7

D. Major, possibly irreversible, alteration or disruption of ecosystem processes. Score: 10

U. Unknown

Documentation:
Identify ecosystem processes impacted (or if applicable, justify choosing answer A in the absence of impact information)

Nutria have major impacts on the ecosystem process of the habitats they invade and are considered to be "ecosystem engineers", meaning that they influence community structure of the habitats in which they invade. Furthermore, nutria invasion results in decreased habitat availability (Crooks 2002). Nutria grazing and burrowing results in erosion of river banks (Carter and Leonard 2002).


Score: 10

1.2. Impact on Natural Habitat

A. No perceived impact; causes no apparent change in native habitat. Score: 0

B. Influences natural habitat (e.g., reduces the stem density and height of one or more native species in core habitat). Score: 3

C. Significantly alters natural habitat (e.g., produces a notable reduction in the population size of one or more native species in core habitat). Score: 7

D. Causes major alteration in natural habitat (e.g., results in the extirpation of one or more native species, or changes the community composition in core habitat towards species exotic to the natural community). Score: 10

U. Unknown

Documentation:
Identify type of impact or alteration:

Cause severe habitat alteration as a result of grazing activities (Fuller 2013, TLDWF 2013) including direct erosion of river banks (Carter and Leonard 2002) and destruction of young shoots and rhizomes of marsh plants (LeBlanc 1994).


Score: 10

1.3. Impact on other species or species groups, including cumulative impact of this species on other organisms in the community it invades (e.g., interferes with native predator/prey dynamics; hybridizes with a native species; hosts a non-native disease which impacts a native species)

A. Negligible perceived impact. Score: 0

B. Minor impact (e.g. 1 species, <20% population decline). Score: 3

C. Moderate impact (e.g. 2-3 species and/or 20-29% population decline of any 1 species). Score: 7
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<table>
<thead>
<tr>
<th>Score</th>
<th>Documentation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Nutria cause damage to agricultural and ornamental crops and plants, including to sugar cane, as well as rice, fruit, nut, and shade trees (LeBlanc 1994). Nutria impact on native communities include extensive grazing on wetland species, including several that are replanted for conservation purposes (USGS 2013). Sources of information: LeBlanc 1994, USGS 2013.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Possible</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section One Total</td>
<td>30</td>
</tr>
</tbody>
</table>

#### 2. Biological Characteristics and Dispersal Ability

**2.1. Mode and rate of reproduction**

<table>
<thead>
<tr>
<th>Score</th>
<th>Documentation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Nutria breed sexually in all seasons and sexually active individuals are present every month of the year in most of their range, although breeding time range has not been confirmed for New York state. Nutria reach sexual maturity at four months and produce liters on average of 4-5 offspring. Sources of information: LeBlanc 1994</td>
</tr>
</tbody>
</table>

**2.2. Migratory behavior**

<table>
<thead>
<tr>
<th>Score</th>
<th>Documentation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Nutria are non-migratory and occupy a home range of roughly 32 acres. Sources of information: LeBlanc 1994</td>
</tr>
</tbody>
</table>

**2.3. Biological potential for colonization by long-distance dispersal/ movement.**

<table>
<thead>
<tr>
<th>Score</th>
<th>Documentation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nutria are non-migratory and establish territories within 10 miles of parent or within a distance twice the home range of the parent, and tend not to cross major barriers such as rivers and major roads. Sources of information: LeBlanc 1994</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Score</th>
<th>Documentation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Nutria are non-migratory and establish territories within 10 miles of parent or within a distance twice the home range of the parent, and tend not to cross major barriers such as rivers and major roads. Sources of information: LeBlanc 1994</td>
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<tr>
<td>2</td>
<td>Nutria are non-migratory and establish territories within 10 miles of parent or within a distance twice the home range of the parent, and tend not to cross major barriers such as rivers and major roads. Sources of information: LeBlanc 1994</td>
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### 2.4. Practical potential to be spread by human activities, both directly and indirectly
(possible vectors include: commercial sales, deliberate stocking, translocation, rehabilitation, pest control industry, agricultural escapes, pet abandonment and release, etc.)

<table>
<thead>
<tr>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Does not occur</td>
<td>0</td>
</tr>
<tr>
<td>B. Low (human dispersal to new areas occurs almost exclusively by direct means and is infrequent or inefficient)</td>
<td>1</td>
</tr>
<tr>
<td>C. Moderate (human dispersal to new areas occurs by direct and indirect means to a moderate extent)</td>
<td>2</td>
</tr>
<tr>
<td>D. High (opportunities for human dispersal to new areas by direct and indirect means are numerous, frequent, and successful)</td>
<td>4</td>
</tr>
<tr>
<td>U. Unknown</td>
<td></td>
</tr>
</tbody>
</table>

**Documentation:**
Identify dispersal mechanisms:
None.
Sources of information:

### 2.5. Non-living chemical and physical characteristics that increase competitive advantage (e.g., tolerance to various extremes, pH, temperature, fill vacant niche, charismatic species)

<table>
<thead>
<tr>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Possesses no characteristics that increase competitive advantage</td>
<td>0</td>
</tr>
<tr>
<td>B. Possesses one characteristic that increases competitive advantage</td>
<td>4</td>
</tr>
<tr>
<td>C. Possesses two or more characteristics that increase competitive advantage</td>
<td>8</td>
</tr>
<tr>
<td>U. Unknown</td>
<td></td>
</tr>
</tbody>
</table>

**Documentation:**
Identify dispersal mechanisms:
Historic establishment of nutria in the United States (1930s) has been caused by range expansion and escape and release from fur farms. State and federal agencies released nutria into several states a to promote the fur trade and control aquatic vegetation. Range expansion continues to be an issue.
Sources of information:

### 2.6. Biological characteristics that increase competitive advantage (e.g., high fecundity, generalist, highly evolved defense mechanisms, behavioral adaptations)

<table>
<thead>
<tr>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
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<tr>
<td>C. Possesses two or more characteristics that increase competitive advantage</td>
<td>8</td>
</tr>
<tr>
<td>U. Unknown</td>
<td></td>
</tr>
</tbody>
</table>

**Documentation:**
Evidence of competitive ability:
Charismatic species valued for their fur.
Sources of information:

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**Score 0**

**Score 4**

**Score 8**
with a relatively high reproductive rate.
Sources of information:
(Genesis Laboratories, Inc. 2002)

2.7. Other species in the family and/or genus invasive in New York or elsewhere?
A. No 0
B. Yes 2
U. Unknown Score 2

Documentation:
Identify species:
Ondatra zibethicus are native to North America, but have been introduced to other parts of
the world (Birnbaum 2006).

3. ECOLOGICAL AMPLITUDE AND DISTRIBUTION
3.1. Current introduced distribution of established populations in the northern
lattitudes of USA and southern latitude of Canada (e.g., between 35 and 55 degrees)
A. Not known from the northern US or southern Canada 0
B. Established as a non-native in 1 northern USA state and/or southern Canadian province 1
C. Established as a non-native in 2 or 3 northern USA states and/or southern Canadian
provinces 2
D. Established as a non-native in 4 or more northern USA states and/or southern Canadian
provinces, and/or categorized as a problem species (e.g., “Invasive”) in 1 northern state or
southern Canadian province 3
U. Unknown Score 3

Documentation:
Identify states and provinces:
Quebec, Ontario, British Columbia, Washington, Oregon, Maryland, Deleware, New York,
Ohio, and Missouri.
Sources of information:
• See known introduced range at www.usda.gov, and update with information from
states and Canadian provinces.

3.2. Current introduced distribution of established populations of the species in
natural areas in the eight New York State PRISMs (Partnerships for Regional
Invasive Species Management)
A. Established in none of the PRISMs 0
B. Established in 1 PRISM 1
C. Established in 2 or 3 PRISMs 3
D. Established in 4 or more PRISMs 5
U. Unknown Score 0

Documentation:
Describe distribution:
No known established populations in New York.
Sources of information:
3.3. Number of known, or potential (each individual possessed by a vendor or consumer is a potential release), individual releases and/or release events (propagule pressure)

A. None 0
B. Few releases (e.g., <10 annually) 2
C. Regular, small scale releases (e.g., 10-99 annually) 4
D. Multiple, large scale (e.g., ≥100 annually) 6
U. Unknown 6

Documentation:
Describe known or potential releases:
Historic establishment of nutria in the United States (1930s) has been caused by range expansion and escape and release from fur farms. State and federal agencies released nutria into several states a to promote the fur trade and control aquatic vegetation. Range expansion continues to be an issue.

Sources of information:

3.4. Current introduced population density in northern USA and/or southern Canada.

A. No known populations established 0
B. Low to moderate population density (e.g., ≤1/4 or < to 1/2 native population density) 1
C. High or irruptive population density (e.g., ≥1/2 native population density) 2
U. Unknown 2

Documentation:
Describe population density:
Quebec, Ontario, British Columbia, Washington, Oregon, Maryland, Delware, New York, Ohio, and Missouri. Can grow to dense populaitons.

Sources of information:

3.5. Number of habitats the species may invade

A. Not known to invade any natural habitats 0
B. Known to occur in 2/3 habitats, with at least 1/2 natural habitat(s) 2
C. Known to occur in 4 or more habitats, with at least 3 natural habitats 3
U. Unknown 3

Documentation:
Identify type of habitats where it occurs and degree/type of impacts:
Brackish waters and marshes, natural lakes and ponds, rivers, ditches, and impoundments.

Sources of information:

3.6. Role of anthropogenic (human related) features in establishment (e.g. buildings, roads, agricultural fields, etc)

A. Requires anthropogenic disturbances to establish 0
B. May occasionally establish in undisturbed areas but can readily establish in areas with 2
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<table>
<thead>
<tr>
<th>Question</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3.7. Climate in native range (e.g., med. to high, ≥5, Climatch score; within 35 to 55 degree latitude; etc.)</strong></td>
<td></td>
</tr>
<tr>
<td>A. Native range does not include climates similar to New York</td>
<td>0</td>
</tr>
<tr>
<td>B. Native range possibly includes climates similar to portions of New York</td>
<td>4</td>
</tr>
<tr>
<td>C. Native range includes climates similar to those in New York</td>
<td>8</td>
</tr>
<tr>
<td>U. Unknown</td>
<td></td>
</tr>
</tbody>
</table>

**Documentation:**
Identify known climate similarities: 16 of 51 stations scored 5 or greater on Climatch.
Sources of information:
ADAFF 2013.

**Total Possible** 30
**Section Three Total** 21

### 4. DIFFICULTY OF CONTROL

**4.1. Re-establishment potential, nearby propagule source, known vectors of re-introduction in vicinity (e.g. biological supplies, pets, game farms, zoos, shooting preserves, connecting corridors, mechanized transportation)**

<table>
<thead>
<tr>
<th>Question</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. No known vectors/ propagule source for re-establishment following removal</td>
<td>0</td>
</tr>
<tr>
<td>B. Possible re-establishment from 1 vector/ propagule source following removal</td>
<td>1</td>
</tr>
<tr>
<td>C. Likely to re-establish from 2-3 vectors/ propagule sources following removal</td>
<td>2</td>
</tr>
<tr>
<td>D. Strong potential for re-establishment from 4 or more vectors/ propagule sources following removal</td>
<td>3</td>
</tr>
<tr>
<td>U. Unknown</td>
<td></td>
</tr>
</tbody>
</table>

**Documentation:**
Identify source/ vectors:
Range expansion most likely current means of new populations, but could also be release intentionally.
Sources of information:
TLDWF 2013.

**Score** 2

**4.2. Status of monitoring and/or management protocols for species**

<table>
<thead>
<tr>
<th>Question</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Standardized protocols appropriate to New York State are available</td>
<td>0</td>
</tr>
<tr>
<td>B. Scientific protocols are available from other countries, regions or states</td>
<td>1</td>
</tr>
<tr>
<td>C. No known protocols exist</td>
<td>2</td>
</tr>
<tr>
<td>U. Unknown</td>
<td></td>
</tr>
</tbody>
</table>

**Documentation:**

**Score** 1
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Describe protocols:
Monitoring protocols exist for some states in the southern and northwestern U.S.

Sources of information:

<table>
<thead>
<tr>
<th>4.3. Status of monitoring and/or management resources (e.g. tools, manpower, travel, traps, lures, ID keys, taxonomic specialists, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Established resources are available including commercial and/or research tools</td>
</tr>
<tr>
<td>B. Monitoring resources may be available (e.g. partnerships, NGOs, etc)</td>
</tr>
<tr>
<td>C. No known monitoring resources are available</td>
</tr>
<tr>
<td>U. Unknown</td>
</tr>
</tbody>
</table>

Documentation:
Established resources are available.
Sources of information:
Anon 2012.

<table>
<thead>
<tr>
<th>4.4. Level of effort required.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Management is not required (e.g., species does not persist without repeated human mediated action)</td>
</tr>
<tr>
<td>B. Management is relatively easy and inexpensive; invasive species can be maintained at low abundance causing little or no ecological harm (e.g., 10 or fewer person-hours of manual effort can eradicate a local population in 1 year)</td>
</tr>
<tr>
<td>C. Management requires a major short-term investment, and is logistically and politically challenging; eradication is difficult, but possible (e.g., 100 or fewer person-hours/year of manual effort, or up to 10 person-hours/year for 2-5 years to suppress a local population)</td>
</tr>
<tr>
<td>D. Management requires a major investment and is logistically and politically difficult; eradication may be impossible (e.g., more than 100 person-hours/year of manual effort, or more than 10 person hours/year for more than 5 years to suppress a local population)</td>
</tr>
<tr>
<td>U. Unknown</td>
</tr>
</tbody>
</table>

Documentation:
Identify types of control methods and time required:
Nutria were successfully eradicated from England in the 1980s following a previously unsuccessful attempt at eradication in the 1960s. The method of eradication is sustained trapping aided by cold winters. eradication is dificult.
Sources of information:

<table>
<thead>
<tr>
<th>Total Possible</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section Four Total</td>
<td>6</td>
</tr>
</tbody>
</table>

| Total for 4 sections Possible | 100 |
| Total for 4 sections | 81 |

### C. STATUS OF GENETIC VARIANTS AND HYBRIDS:

At the present time there is no protocol or criteria for assessing the invasiveness of genetic variants independent of the species to which they belong. Such a protocol is needed, and individuals with the appropriate expertise should address this issue in the future. Such a protocol will likely require data on cultivar fertility and identification in both experimental and natural settings.
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Genetic variants of the species known to exist:

Hybrids (crosses between different parent species) should be assessed individually and separately from the parent species wherever taxonomically possible, since their invasiveness may differ from that of the parent species. An exception should be made if the taxonomy of the species and hybrids are uncertain, and species and hybrids can not be clearly distinguished in the field. In such cases it is not feasible to distinguish species and hybrids, and they can only be assessed as a single unit.

Hybrids of uncertain origin known to exist:

References for species assessment:

Acknowledgments: The New York Terrestrial Vertebrate Invasiveness Ranking Form incorporates components and approaches used in several other systems, cited in the references below. Valuable contributions by members of the Invasive Species Council and Invasive Species Advisory Committee were incorporated in revisions of this form. Members of the Office of Invasive Species Coordination’s Four-tier Team, who coordinated the effort, included representatives of the New York State Department of Environmental Conservation* (Division of Fish, Wildlife and Marine Resources, Division of Lands and Forests, Division of Water); The Nature Conservancy; New York Natural Heritage Program; New York Sea Grant; Lake Champlain Sea Grant*; New York State Department of Agriculture and Markets (Division of Plant Industry and Division of Animal Industry); Cornell University (Department of Natural Resources and Department of Entomology); New York State Nursery and Landscape Association; New York Farm Bureau; Brooklyn Botanic Garden; Pet Industry Joint Advisory Council*; Trout Unlimited; United States Department of Agriculture Animal and Plant Health Inspection Service* (Plant Protection and Quarantine and Wildlife Services); New York State Department of Transportation; State University of New York at Albany and Plattsburgh; and Cary Institute of Ecosystem Studies. Those organizations listed with an asterisk comprised the Terrestrial Vertebrate Working Group.

References for ranking form:


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