

**Vegetation Mapping Feasibility
at Boston Harbor Islands**

and

Saugus Iron Works National Historic Site

Final Report

**Lesley Sneddon, NatureServe
June 2004**



INTRODUCTION

The National Park Service requested a study of the feasibility of mapping vegetation according to the Vegetation Mapping Program standards at Saugus Iron Works National Historical Site and Boston Harbor Islands National Recreation Area. Because both of these parks are presently dominated by non-native vegetation and have been severely altered by human activities for many years, it was questioned whether to proceed with standard NPS vegetation mapping of "natural" communities at these parks. As vegetation sampling was underway at these parks including floristic inventory and community description, wetlands inventory, intertidal inventory or invasive species inventory, it was thought that a review of existing information was also appropriate should the decision to proceed be made. This report was prepared to allow for review the existing information related to vegetation mapping and to provide sound justification for why implementing a vegetation mapping effort would be valuable.

NatureServe ecologist Lesley Sneddon met with park staff and with other knowledgeable individuals, and conducted field visits at both parks. Existing information from both parks, including draft digital vegetation maps and classifications, was assembled and evaluated to determine what data could be applied to a potential mapping and classification effort.

BOSTON HARBOR ISLANDS

STATUS OF CURRENT DATA

A draft vegetation map produced by Ted Elliman is based on 2000 orthophotography available from MassGIS. The digital map is housed at the Boston Office of NPS. 145 rapid assessment vegetation plot samples were collected in 2001-2002. These data were provided to NPS and to the Massachusetts Natural Heritage and Endangered Species program. Data were not collected on beach, wrack line, mud flat and salt marsh vegetation, as this vegetation had been mapped through a study of intertidal habitats (Bell et al. 2002). A draft vegetation classification, exclusive of intertidal vegetation, was developed (Elliman 2002) and cross-referenced to the Massachusetts Natural Heritage and Endangered Species Program (Swain and Kearsley 2000) and to the NVCS.

The aforementioned study of intertidal habitats (Bell et al. 2002) suggests that the intertidal zone of the 34 island in the park represent more than half the total park area, a significant natural resource. This study classified the intertidal zone of 21 park islands by substrate type and biotic community, using the National Wetland Classification System (Cowardin et al. 1979) as the foundation for classifying biotic assemblages.

METHODS

Elliman submitted the draft classification to NatureServe ecologist Lesley Sneddon for comment, and hard copies of the draft maps were acquired from NPS. A field visit was made by Sneddon and Elliman, later joined by Bruce Jacobsen, at Thompson's Island in October 2003. This island was chosen for reconnaissance because it supports the greatest

variety of vegetation types also represented on many of the other islands. We visited most of the island in a reconnaissance.

RESULTS

The reconnaissance provided an excellent overview of vegetation types at Thompson Island, and Elliman provided ample information regarding the vegetation at the other islands as well. On Thompson Island, we noted the following vegetation types:

Forests and Shrublands:

- *Acer platanoides* Forest
- Maritime forest characterized by *Quercus velutina* canopy, and herbaceous layer characterized by *Hieracium canadense*, *Quercus* seedlings, *Schizachyrium scoparium*, *Poa pratensis*.
- Maritime shrubland characterized by very open canopy of *Prunus serotina*, *Ailanthus altissima*, with *Rhus typhina* the dominant shrub

Old Fields

- Old fields: one occurring on shingle adjacent to beach strand, characterized by *Agropyron repens*, *Aremisia vulgaris*, *Rhus typhina*; others on the interior of the island adjacent to salt marsh

Salt Marshes

- Brackish wetland dominated by *Lepidium latifolium*, an exotic invasive
- Two *Spartina alterniflora* salt marshes, one small one adjacent to the beach with shallow peat over shingle, and another larger occurrence on peat on the opposite side of the island
- Salt panne characterized by *Sueda maritima* and *Salicornia virginica*
- High salt marsh dominated by *Spartina patens* occurring on a salt pond
- *Phragmites*-dominated marsh in the old skating pond

Beaches

- *Ammophila breviflora* "dune" grassland occurring in a narrow band adjacent to the beach
- Beach strand vegetation characterized by *Xanthium echinatum*, *Salsola kali*, *Solidago sempervirens*

RECOMMENDATIONS

Despite the long history of human manipulation on the Boston Harbor Islands, natural vegetation does occur and is maintained by natural processes. The vegetation also occurs in patches of sufficient size to monitor and manage. Despite the high incidence of exotic species, natural succession as well as selective management and restoration may increase the more native aspect of at least some of the vegetation types over time. It is my recommendation that the Boston Harbor Islands be included in the NPS Vegetation Mapping Program in the same manner as other parks. Heavily modified vegetation may

be mapped using Anderson Level II (Anderson et al. 1976), while natural and semi-natural vegetation may be mapped using the NVCS.

The Elliman (2002) classification provides good descriptions of types that are closely aligned with the NVC to the extent possible, and provides an excellent basis from which to plan additional field sampling. The draft map produced by Elliman and the Bell et al. (2002) map of intertidal habitats provide an excellent starting point from which to develop a vegetation map using the NVCS and adhering to VMP standards. The following suggestions are offered for consideration:

- Photography: NPS commissioned new aerial photography for BOHA. Partial coverage of leaf-off CIR aerial photography was flown in 2003, with the remainder flown leaf-on in spring 2004. This photography can be used in combination with existing 0.5-m resolution 2001 true-color 1:5000 scale orthophotography available from MassGIS. Use of stereo pairs provided by NPS should be used to check the precision of polygons on the draft map. Some polygons may require division if they contain more than one NVCS association, and if the resulting divided polygons are above minimum mapping unit (salt marsh, wrack line, etc.).
- Plot data: vegetation plots using VMP standards should be collected for each vegetation type, including those types not having rapid assessment data (beach, mudflat, salt marsh and wrack line). The draft list of types identified by Elliman, and the Bell et al. (2002) study should be used as a means to place the plots.
- Classification: the draft classification used by Elliman is very close in concept and scale to the NVCS association level (Appendix 1). Many of the map units require a simple change to the NVCS, while others contain more than one association.
- Description: The 145 rapid assessment plots collected by Elliman provide extremely valuable data that should be used to describe the NVCS units in park-specific descriptions. These data should be acquired and entered into the VMP PLOTS database.
- Mapping: the draft map of Elliman should be used as a starting point and may be edited and submitted as a final product using newly flown stereo pairs and existing 2001 digital photography available from MassGIS as the base.
- The proposed vegetation mapping project will utilize the data from Bell et al. (2002) in two ways. Preliminary data on vascular plants identified in the study will be reviewed to inform the mapping effort. Also, the polygons created in the field during the study have been adopted by the park and serve as the boundary between the intertidal zone and "upland" communities. Polygons created for vegetation mapping will adopt these polygons for use with any data collected below the high tide line defined in the intertidal study and as the "edge" of polygons created for the vegetation mapping in the park "upland." NVC names will be applied to vegetation classified by Bell et al. (2002).

SAUGUS IRON WORKS

I made a field visit to Saugus Iron Works in July 2003, accompanied by Brad Agius, who had been contracted by the park to map locations of exotic and invasive species at the site. We discussed the methods he was using to collect field data and the potential for adapting them to accommodate the standards of the Vegetation Mapping Program. Although ultimately it was decided that data collection for the VMP was beyond the scope of his work, Agius did use the draft list of NVC types identified in our visit to develop a draft vegetation map of the site using existing black and white 1:5000 digital orthophotography (Aguis 2003a).

We visited each of the preliminary types he had identified during reconnaissance. I have high confidence that we were able to see the full variability of all vegetation at this small site. I took notes at each of the types, then we returned to the park office where I generated a report of all the potential NVC alliances and associations that we had seen. Since that visit, several of the alliances that we had identified at the time were deemed incorrect upon further reflection. For example, we had identified several alliances as tidal because the Saugus River is historically tidal but has been dammed for many years. The vegetation that would occur in a normal tidal regime would be quite different than what currently exists. Although there is some negligible tidal flooding, I have since decided that the non-tidal vegetation wetland types on the river are more appropriate classification units. The following table identifies the updated alliances used in this report:

Agius 2003 Alliance code	Agius 2003 Alliance Name	Updated Alliance Code	Updated Alliance Name
V.A.5.N.n.7.	<i>Phragmites australis</i> Tidal Herbaceous Alliance	V.A.5.N.1.4.	<i>Phragmites australis</i> Semi-permanently Flooded Herbaceous Alliance
V.A.5.N.n.2.	<i>Typha (angustifolia, domingensis)</i> Tidal Herbaceous Alliance	V.A.5.N.1.9.	<i>Typha (angustifolia, latifolia)</i> - (<i>Schoenoplectus</i> spp.) Semipermanently Flooded Herbaceous Alliance
V.B.2.N.g.3.	<i>Peltandra virginica</i> - <i>Pontederia cordata</i> Tidal Herbaceous Alliance	V.B.2.N.e.1.	<i>Pontederia cordata</i> - <i>Peltandra virginica</i> Semipermanently Flooded Herbaceous Alliance

The following table lists all the vegetation types currently known from Saugus Iron Works. Those alliances that have been substituted with the more appropriate choices are noted below with an asterisk (*). Areas in square meters are taken from Aguis 2003:

Alliance code	Alliance name	Association code	Association name	Area (m ²)	Area (ha)
I.B.2.N.a.39.	<i>Quercus rubra</i> – (<i>Acer saccharum</i>) Forest Alliance	CEGL006600	<i>Quercus rubra</i> – <i>Betula alleghaniensis</i> / <i>Osmunda cinnamomea</i> Forest	5859	0.6
V.A.5.N.c.103.	<i>Dactylis glomerata</i> – <i>Rumex acetosella</i> Herbaceous Alliance	CEGL006107	<i>Dactylis glomerata</i> – <i>Rumex acetosella</i> Herbaceous Vegetation	13947	1.4
V.A.5.N.k.20.	<i>Phalaris arundinacea</i> Seasonally Flooded Herbaceous Alliance	CEGL006044	<i>Phalaris arundinacea</i> Eastern Herbaceous Vegetation	153	0.02
V.A.5.N.k.33.	<i>Typha</i> Spp. – (<i>Schoenoplectus</i> Spp., <i>Juncus</i> Spp.) Seasonally Flooded Herbaceous Alliance	CEGL002026	<i>Schoenoplectus tabernaemontani</i> – <i>Typha</i> spp. – (<i>Sparganium</i> spp., <i>Juncus</i> spp.) Herbaceous Vegetation	3292	0.3
V.A.5.N.l.4.*	<i>Phragmites australis</i> Semi-permanently Flooded Herbaceous Alliance	CEGL004141	<i>Phragmites australis</i> Eastern North America Temperate Semi-natural Herbaceous Vegetation	8103	0.8

Alliance code	Alliance name	Association code	Association name	Area (m ²)	Area (ha)
V.A.5.N.1.9.*	<i>Typha</i> (<i>angustifolia</i> , <i>latifolia</i>) - (<i>Schoenoplectus</i> spp.) Semipermanently Flooded Herbaceous Alliance	CEGL006153	<i>Typha</i> (<i>angustifolia</i> , <i>latifolia</i>) - (<i>Schoenoplectus</i> spp.) Eastern Herbaceous Vegetation	1745	0.2
V.B.2.N.f.13	<i>Symplocarpus foetidus</i> – <i>Caltha palustris</i> Saturated Herbaceous Alliance	CEGL006567	<i>Symplocarpus foetidus</i> Herbaceous Vegetation	4307	0.4
V.B.2.N.e.1.*	<i>Pontederia cordata</i> – <i>Peltandra virginica</i> Semipermanently Flooded Herbaceous Alliance	CEGL006191	<i>Pontederia cordata</i> – <i>Sagittaria latifolia</i> Herbaceous Vegetation	174	0.02

Calculated area must be considered approximate despite the implied precision because the lines were drawn as an aid to data collection in Agius' primary study of exotic species locations (Agius 2003b) and not as a result of methodical photointerpretation using stereo pairs.

ASSESSMENT AND RECOMMENDATIONS

Vegetation classification

The Vegetation Mapping Program dictates the collection of plot data for at least two purposes: 1) to correctly classify the vegetation and 2) to more fully describe the vegetation type as it occurs in the park. The second purpose of plot data is particularly important at SAIR because the high incidence of exotic species imposes a relatively high degree of difference of the park vegetation from the global description. The draft vegetation classification of SAIR is likely to be correct at the alliance level, and I am confident that at the association level many of the types are likely to be correctly assigned as well. However, the small size of polygons, as well as the presence of large numbers of exotics makes final assignment to a NVC type of low confidence in some cases. The following is a summary of my assessment of confidence in the classification units recommendations for further data collection at SAIR:

1. I.B.2.N.a.39. This single forest type mapped by Agius (*Quercus rubra* – (*Acer saccharum*) Forest Alliance and classified at the association level by inspection as *Quercus rubra* – *Betula alleghaniensis* / *Osmunda cinnamomea* Forest, is poorly known from its range, however I am moderately confident that this type is correctly identified. The area calculated by Agius is an overestimate, however, as portions of the map unit are actually a second highly altered upland forest type dominated by *Acer platanoides* and other non-native species. These two types occur adjacent to each other in a complex and would have required intensive use of GPS to accurately map them individually. At 0.6 ha the entire map unit of both types barely meets the requirements for minimum mapping unit, and the area occupied by *Quercus rubra* – *Betula alleghaniensis* / *Osmunda cinnamomea* Forest is considerably less than this. There is unlikely to be a patch large enough to accommodate collection of a plot of this type.
2. The second upland forest type included in the forest map unit (I.B.2.N.a.39) is dominated by *Acer platanoides* and is currently not included in the NVC. As this is altered vegetation and the area occupied by it is below minimum mapping unit, further data collection is not recommended.
3. V.A.5.N.c.103. This vegetation mapped as *Dactylis glomerata* – *Rumex acetosella* Herbaceous Alliance is a unit encompassing fields, lawns and picnic area at SAIR. It is broadly defined in the NVC and is comprised almost entirely of non-native grasses and forbs. At SAIR, scattered large white pines also occur in this type. It is correctly identified, although a case could be made that portions mapped as this type may alternatively mapped using the Anderson classification as Other Urban / Built Up Land. This is highly altered vegetation and plot data collection is not recommended.
4. V.A.5.N.k.20. *Phalaris arundinacea* Seasonally Flooded Herbaceous Alliance is mapped along the northeastern river shore, but in a patch considerably below minimum mapping unit. The species *Phalaris arundinacea* is native to the United States and Canada, but is now more widely distributed and abundant because of local introductions from both local and European populations, so as a natural vegetation type, its status is unclear. Plot placement on this narrow strip of arguably non-native vegetation would be a challenge. Further plot data collection is not recommended.
5. V.A.5.N.k.33. *Typha* Spp. – (*Schoenoplectus* Spp., *Juncus* Spp.) Seasonally Flooded Herbaceous Alliance. This vegetation type occurs adjacent to the slag pile and on the western shore of the river. At the alliance level, classification confidence is high, but is tentatively classified to the association level as *Schoenoplectus tabernaemontani* – *Typha* spp. – (*Sparganium* spp., *Juncus* spp.) Herbaceous Vegetation. This vegetation, although modified from its original state as a result of tidal restriction, is comprised in large part by native species. At 0.3 ha, it is below minimum mapping unit but this vegetation often occurs naturally in small patches. One plot is recommended to confirm classification and for the park-specific description.
6. V.A.5.N.l.4, *Phragmites australis* Semi-permanantly Flooded Herbaceous Alliance, occupies a relatively large area (0.8 ha) adjacent to the river. (On the Agius map, this type is mapped as V.A.5.N.n.7). This is an invasive community that replaced *Spartina* salt marshes when the dam was built. Some native species such as *Onoclea sensibilis* and *Impatiens capensis* persist as an “understory” beneath *Phragmites*. In the admittedly unlikely event that tidal flow is restored to the river, replacement of this

vegetation by *Spartina* (presumably *S. alterniflora*, but may also be *Spartina patens*) would be anticipated. Plot data collection would be recommended prior to the restoration of tidal flow.

7. V.A.5.N.1.9, *Typha (angustifolia, latifolia)* - (*Schoenoplectus* spp.) Semipermanently Flooded Herbaceous Alliance. (On the Agius map, this type is mapped as V.A.5.N.n.2). It is classified to the association level by inspection and is of moderate confidence at this level. This cattail-dominated vegetation occurs in linear stands adjacent to the river. The entire type occupies less than 0.2 ha and as such is below minimum mapping unit. As a type supporting native species, one plot for descriptive purposes and to confirm identity at the association level is recommended.
8. V.B.2.N.f.13, *Symplocarpus foetidus* – *Caltha palustris* Saturated Herbaceous Alliance. This vegetation, known commonly as a woodland seep, occurs as small patches within the forest adjacent to the river. Acreage estimates may be erroneous because this vegetation occurs as small patches and a narrow strip along the river and would be difficult to map as a separate unit. Estimates are further complicated by the fact that unlike nearly all other vegetation types, this type is classified as an herbaceous type despite its occurring under a tree canopy. The overhanging canopy is contributed by the adjacent forest and is unrelated to the vegetation occurring in the seep, so is not used to classify this vegetation. The examples at SAIR have a relatively high proportion of native species. A single plot is recommended, provided a patch large enough to sample exists.
9. V.B.2.N.e.1. *Pontederia cordata* – *Peltandra virginica* Semipermanently Flooded Herbaceous Alliance. (On the Agius map, this type is mapped as V.B.2.N.g.3). This emergent vegetation occupies very small patches, well below minimum mapping unit, on the river. Classification at the association level is tentative, however there is likely insufficient area to sample and no plots are recommended.

CONCLUSION

Classification

This small park supports very little natural vegetation. Agius states that over 70% of available habitat is inhabited by 11 invasive species. All vegetation types are identified reasonably confidently to alliance level, and in most cases classified to association level with at least moderate confidence. In vegetation dominated or with a high cover of native species, additional data collection noted above using Vegetation Mapping protocols is recommended to more fully describe these types at SAIR and to confirm the classification at the association level. In the case of *Phragmites*-dominated vegetation, plot data collection is recommended only in the event that tidal restrictions are removed, thus allowing the establishment of native vegetation.

Mapping:

Vegetation mapping is generally undertaken to inventory vegetation types at a park, with the map then providing a basis from which to establish a monitoring program that will inform management practices. The draft map generated by Agius is arguably sufficient for this purpose, despite the caveats noted above: areal estimates should be regarded as approximate because rigorous photointerpretation techniques using stereo pairs was not employed. All native vegetation types occurring at SAIR occur in patches below

minimum mapping unit, and none of the types is considered rare or endangered. Management of any of the vegetation types to achieve natural conditions at this park would require a significant commitment of resources. Therefore, it is suggested that accepting the draft map produced by Agius for inventory and description of vegetation at SAIR is sufficient.

However, if the decision IS made to commit resources to restoration, the pragmatic approach of adapting the draft map produced by Agius is a possible solution. The following is suggested for consideration:

- Upland meadows and fields: the most highly altered vegetation type at the park is the *Dactylis glomerata* – *Rumex acetosella* Herbaceous Alliance, and the draft polygons produced by Agius may be considered final for this alliance.
- Forests: the draft polygons for Agius map units I.B.2.N.a.39 and V.B.2.N.f.13 should be combined into a single forested map unit, which also includes the Norway maple forest. The single forested map unit would encompass the three types, and forested seeps may be denoted by points rather than polygons if desired.
- Wetland herbaceous vegetation: editing the polygon lines for the remaining vegetation types should be done using stereo pairs, or if stereo pairs are unavailable, use of field GPS to mark the lines where not obvious on photography: V.A.5.N.k.33. (*Typha* Spp. – (*Schoenoplectus* Spp., *Juncus* Spp.), V.A.5.N.n.2. (*Typha* (*angustifolia*, *latifolia*) – (*Schoenoplectus* spp.), and V.A.5.N.n.7. (*Phragmites australis*). The following Agius map units should be combined with the adjacent polygons and noted by point location only (if desired) because they are considerably below minimum mapping unit: V.A.5.N.k.20. (*Phalaris arundinacea*) and V.B.2.N.g.3. (*Pontederia cordata* – *Peltandra virginica*).

If the decision is made to pursue vegetation mapping at these parks using VMP protocols, it is recommended that a complete set of mapping deliverables be assembled and delivered to NPS.

References

- Agius, B. 2003a. Vegetation classification of Saugus Iron Works National Historic Site. Unpublished report to the National Park Service. 4 pp. plus appendices.
- Agius, B. 2003b. Forgin changes in an American landscape: Invasive plant species at the Saugus Iron Works National Historical Site. Unpublished report to the National Park Service. 16 pp.
- Anderson, J.R., E.E. Hardy, J.T. Roach, and R.W. Witmer. 1976. A land use and land cover classification system for use with remote sensor data. Geological Survey professional paper 964. US Government Printing Office, Washington, DC. 28 pp.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetland and deepwater habitats of the United States. U.S. Fish and Wildlife Service. FWS/OBS-79/31.
- Elliman, T. 2002. Untitled report on natural communities of Boston Harbor Islands. Report to the National Park Service. 12 pp.
- NatureServe 2003. International Classification of Ecological Communities: Terrestrial Vegetation. Natural Heritage Central Databases. NatureServe, Arlington, VA.

Appendix 1
Provisional Classification (Elliman 2002) and NVC Crosswalk for Boston Harbor Islands

Provisional Name (Elliman 2002)	National Vegetation Classification equivalent	NVC Code	Classification Confidence
<i>forests and woodlands</i>			
Oak-Hickory Forest	Quercus (alba, rubra, velutina) / Cornus florida / Viburnum acerifolium Forest	CEGL006336	Moderate
Norway Maple Forest	Not currently described in NVC	none	Will be added to NVC
Mixed Maritime Forest/Woodland	"Modified successional forest" – not currently described in NVC	none	Will be added to NVC
Sassafras-Hackberry Maritime Forest	Prunus serotina - Sassafras albidum - Amelanchier canadensis - Quercus velutina / Smilax rotundifolia Shrubland	CEGL006145	Moderate.
Aspen-Gray Birch Woodland	Populus (tremuloides, grandidentata) - Betula (populifolia, papyrifera) Woodland	CEGL006303	Low – either will need a new type in this alliance, or redefining of this type to accommodate BOHA
Red Cedar Woodland	Juniperus virginiana var. virginiana / Morella pensylvanica Woodland	CEGL006212	Moderate – low: may need to split off a rocky headland association.
Black Pine Forest	Pinus thunbergiana Forest	CEGL006012	Moderate. This is Pinus nigra, but rather than identify a new type, this 6012 should be broadened to accommodate this species as well.
Oak forest of Thompsons' Island	Quercus coccinea - Quercus velutina / Sassafras albidum / Vaccinium pallidum Forest	CEGL006375	Moderate - high
Forested swamp (World's End)	Acer rubrum / Rhododendron viscosum - Clethra alnifolia Forest	CEGL006156	Low to moderate – several other possible types

<i>shrub communities</i>			
Maritime Shrub Community	<i>Prunus serotina</i> - <i>Rhus typhina</i> Shrubland	CEGL006399	Moderate – type description will need to be amended to accommodate variation on BOHA
Dwarf Maritime Shrub Community	<i>Morella pensylvanica</i> - <i>Prunus maritima</i> Shrubland	CEGL006295	Moderate – low; may be degraded
<i>field communities</i>			
Old Field Community	<i>Dactylis glomerata</i> - <i>Rumex acetosella</i> Herbaceous Vegetation	CEGL006107	High
Little Bluestem Grassland	Not yet described in NVC	none	New type to be incorporated (exists at other parks also)
<i>wetland communities</i>			
Shrub Swamp	<i>Cephalanthus occidentalis</i> / <i>Glyceria canadensis</i> Shrubland	CEGL006069	Moderate - high
<i>Phragmites</i> marsh	<i>Phragmites australis</i> Eastern North America Temperate Semi-natural Herbaceous Vegetation	CEGL004141	High
Cattail-Rose Mallow Marsh	<i>Typha angustifolia</i> - <i>Hibiscus moscheutos</i> herbaceous vegetation	CEGL004201	Moderate
Cattail Marsh	<i>Typha (angustifolia, latifolia)</i> - <i>Scirpus spp.</i> eastern herbaceous vegetation	CEGL006153	Moderate - high
<i>maritime cliff and beach communities</i>			
Maritime Erosional Cliff Community	No NVC equivalent	None	May need new NVC type
Maritime Rock Cliff Community	No NVC equivalent	None	May need new NVC type
Maritime Dunes	<i>Ammophila breviligulata</i> - <i>Lathyrus japonicus</i> Herbaceous Vegetation	CEGL006274	Moderate - high
Beach Strand	<i>Cakile edentula</i> ssp. <i>edentula</i> - <i>Chamaesyce polygonifolia</i> Sparse Vegetation	CEGL004400	High

