

Final Report for Project 002/08A (“Anticipating the Imminent Invasion of the Chinese Mitten Crab into the Hudson River”)

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The purpose of this project was to gather pre-invasion information on the condition of Tivoli North Bay before the outbreak of the non-native Chinese mitten crab (*Eriocheir sinensis*) in the Hudson River. This species was first detected in the Northeast in 2002 (USGS 2012). Native to China, it has established itself in northern Europe and San Francisco Bay, where it has become abundant and caused large ecological impacts (Chinese Mitten Crab Working Group 2003, Rudnick et al. 2003, 2005, Global Invasive Species Database 2008, NOBANIS 2008, Dittel and Epifanio 2009). As of this writing, mitten crabs have not yet become abundant in the Hudson, and it is not known whether it will become abundant.

The Chinese mitten crab is a catadromous species native to east Asian rivers. Adults breed in the ocean, where the larvae develop, and juveniles migrate into fresh water. These migrations may take mitten crabs hundreds of kilometers inland. The crabs then spend 1-5 years in fresh water, feeding on plants, shellfish, worms, fishes, and carrion. Mitten crabs are, in turn, eaten by large fish, wading birds, and people. Especially in tidal waters, mitten crabs burrow into river banks and dikes. When the animals reach maturity, they migrate back down to marine waters (information from Chinese Mitten Crab Working Group 2003, Global Invasive Species Database 2008, NOBANIS 2008).

Mitten crabs have had large, negative economic impacts including damage to levees and dikes, blocking water intakes, and disruption of sport and commercial fisheries (they damage nets and netted fishes and steal bait). Total economic losses in Germany are estimated to exceed \$100 million since 1912. The ecological effects of this species are less well studied, but may include loss of vegetation and macroinvertebrate populations, competition with native decapods, and increased erosion from burrowing into creek and river banks (Rudnick et al. 2005, NOBANIS 2008). Potential ecological impacts on the Hudson include increased erosion in tidal creeks and along the river, damage to vegetation, reductions in populations of invertebrate prey, and competition with the native blue crab and crayfishes.

One of the largest impacts of the mitten crab in San Francisco Bay has been the effects of its burrows on marsh erosion and vegetation (Rudnick et al. 2005). Because the Hudson contains large areas of tidal marshes, such impacts may be important in the Hudson as well. The purpose of this project was to gather information on the morphology and vegetation of an important freshwater tidal marsh along the Hudson before mitten crab impacts occurred. If the mitten crab population expands in the Hudson, these data can serve as a baseline against which impacts can be measured.

The study site is Tivoli North Bay, a freshwater tidal marsh near river kilometer 160. Cattails cover most of the marsh area. At lower elevations, along the tidal creeks themselves, spatterdock, pickerelweed, and arrow arum predominate. Wild-celery and other submersed plants live in the beds of the tidal creeks themselves.

We examined vegetation and creek bank morphology along one of the tidal creeks in Tivoli North Bay. Vegetation was measured by (1) clipping, identifying, and weighing vegetation in 10 randomly placed 0.25m² quadrats in the creek bottom; (2) counting and identifying live and senescent stems in ten 1 m² plots on the creek banks; (3) counting and identifying live and standing dead stems in ten 0.25 m² plots at the top edge of the creek bank (in the cattails) and 5 m back from the edge of the creek bank. GPS readings and photographs (2009) were taken at each sampling plot. In addition, creek bank profiles were measured at ten points. Measurements were made in 29 Aug-2 Sept 2008 and 18 Aug-21 Aug 2009. Dr. Jorge Gutierrez of the University of Mar del Plata (Argentina), an expert on tidal marshes and crab ecology, made all of the field measurements.

Although we deployed traps (“crab condos”) and examined the marsh carefully for signs of crab burrows, live crabs, and molts, we did not see any evidence of mitten crab presence in Tivoli North Bay in either 2008 or 2009. Because this study is intended as a baseline against which to measure impacts (if they occur), we did not perform any detailed analysis of the results.

The two Excel files that accompany this report include all of the data that we collected; in addition, we include the photographs that we took in 2009.

References

- Chinese Mitten Crab Working Group. 2003. National Management Plan for the Genus *Eriocheir* (Mitten Crabs). Available at <http://www.anstaskforce.gov/Species%20plans/national%20mgmt%20plan%20for%20mitten%20crab.pdf>.
- Dittel, A.I., and C.E. Epifanio. 2009. Invasion biology of the Chinese mitten crab *Eriocheir sinensis*: a brief review. *Journal of Experimental Marine Biology and Ecology* 374: 79-92.
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Rudnick, D.A., V. Chan, and V.H. Resh. 2005. Morphology and impacts of the burrows of the Chinese mitten crab, *Eriocheir sinensis* H. Milne Edwards (Decapoda, Grapsoidea), in South San Francisco Bay, California, USA. *Crustaceana* 78: 787-807.

USGS. 2012. *Eriocheir sinensis* collection information.

<http://nas.er.usgs.gov/queries/collectioninfo.asp?SpeciesID=182>.

RANGE

E-W N-S
0588959 4654525
0588957 4654460

SAMPLE VALLISNE MYRIOPH` ZOOSTER BROAD-LE BROAD-LEAVED II

| | | | | | |
|----|--------|-------|-------|------|------|
| 1 | 8.95 | 0 | 14.06 | 0 | 0 |
| 2 | 1.45 | 2.49 | 15.74 | 0.08 | 0 |
| 3 | 3.74 | 7.57 | 0 | 0.22 | 0 |
| 4 | 30.85 | 0.59 | 0 | 0 | 0.42 |
| 5 | 31.67 | 0 | 22.45 | 0 | 0 |
| 6 | 29.93 | 29.18 | 0 | 0 | 0.19 |
| 7 | 17.06 | 0 | 11.59 | 0 | 0 |
| 8 | 24.19 | 1.34 | 11.5 | 0.19 | 0.2 |
| 9 | 55.96 | 0 | 0 | 0 | 0 |
| 10 | 106.62 | 0 | 13.24 | 0 | 0 |

| E-W | N-S | TOTAL | SENESCENT |
|---------|---------|-------|-----------|
| 0588960 | 4654465 | 35 | 13 |
| 0588963 | 4654473 | 60 | 18 |
| 0588964 | 4654481 | 46 | 11 |
| 0588962 | 4654488 | 34 | 8 |
| 0588963 | 4654500 | 59 | 13 |
| 0588964 | 4654511 | 33 | 18 |
| 0588964 | 4654521 | 32 | 22 |
| 0588965 | 4654530 | 77 | 20 |
| 0588966 | 4654541 | 47 | 23 |
| 0588964 | 4654549 | 56 | 29 |

PLOT SIZE = 1 X 1 mts.

SENESCENT = STIFF STEMS SHOW
STANDING-DEAD DECOMPOSITION
(COMMUNED EDGES) PLUS ROOT
SHOWING PARTIAL OR TOTAL CON
SEDIMENTS AND A MORE ADVANCE

ING LEAVES WITH SIGNS OF
(CONCAVE LEAVES WITH
ED BUT FALLEN STEMS
ITACT WITH THE BOTTOM
ED STATE OF LEAF DECAY.

| E-W | N-S | NARROW CATTAIL TOTAL | NUPHAR ST. DEAD | TOTAL | SENESCENCE | ARROW A | COMMON | PICKEREL |
|---------|---------|-------------------------|--------------------|-------|------------|---------|--------|----------|
| 0588996 | 4654497 | 44 | 7 | 0 | 0 | 6 | 0 | 0 |
| 0588996 | 4654496 | 38 | 7 | 0 | 0 | 0 | 1 | 0 |
| 0588991 | 4654499 | 17 | 0 | 0 | 0 | 0 | 1 | 0 |
| 0588987 | 4654498 | 19 | 3 | 0 | 0 | 0 | 0 | 0 |
| 0588985 | 4654502 | 36 | 3 | 0 | 0 | 8 | 0 | 0 |
| 0588979 | 4654503 | 16 | 4 | 2 | 2 | 0 | 0 | 5 |
| 0588978 | 4654506 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0588973 | 4654508 | 20 | 2 | 4 | 2 | 0 | 0 | 3 |
| 0588972 | 4654511 | 27 | 3 | 0 | 0 | 0 | 0 | 0 |
| 0588973 | 4654516 | 37 | 8 | 0 | 0 | 0 | 0 | 0 |

WILD RICE DOTTED SWATER HIBUGLEWEED

| | | | |
|---|---|---|---|
| 0 | 3 | 0 | 0 |
| 0 | 1 | 2 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 2 | 0 | 0 |
| 0 | 0 | 0 | 2 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 3 | 0 | 0 |
| 4 | 0 | 0 | 0 |

PLOTS = 50 X 50 cm.
ST. DEAD = COMPLETELY DRY STEMS (P/ DRY STEMS WERE CONSIDERED ALIVE; I VIRTUALLY ALL THE REMAINING STEMS)
ALSO OBSERVED OUT OF THE PLOTS: BR CATTAIL

ARTIALLY
.E.

ROADLEAF

| E-W | N-S | NARROW CATTAIL | | BROAD CATTAIL | | ARROW A | COMMON | JEWELWE |
|---------|---------|----------------|----------|---------------|----------|---------|--------|---------|
| | | TOTAL | ST. DEAD | TOTAL | ST. DEAD | | | |
| 0589000 | 4654500 | 32 | 15 | 0 | 0 | 7 | 0 | 1 |
| 0588995 | 4654501 | 26 | 9 | 0 | 0 | 14 | 0 | 0 |
| 0588992 | 4654503 | 10 | 1 | 25 | 2 | 0 | 6 | 0 |
| 0588988 | 4654502 | 8 | 0 | 21 | 1 | 13 | 0 | 0 |
| 0588985 | 4654506 | 49 | 5 | 6 | 1 | 5 | 1 | 2 |
| 0588981 | 4654505 | 14 | 0 | 0 | 0 | 20 | 0 | 0 |
| 0588981 | 4654510 | 9 | 0 | 0 | 0 | 15 | 0 | 0 |
| 0588980 | 4654511 | 10 | 3 | 0 | 0 | 7 | 0 | 1 |
| 0588977 | 4654514 | 16 | 2 | 0 | 0 | 5 | 0 | 1 |
| 0588973 | 4654513 | 33 | 9 | 0 | 0 | 11 | 0 | 1 |

WATER HILLOTTED & RICE CUTGRASS

| | | |
|---|---|----|
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| 1 | 0 | 0 |
| 0 | 0 | 0 |
| 0 | 3 | 5 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| 0 | 2 | 13 |
| 0 | 0 | 5 |

PLOTS = 50 X 50 cm.

ST. DEAD = COMPLETELY DRY STEMS (PARTIALLY DRY STEMS WERE CONSIDERED ALIVE; I.E. VIRTUALLY ALL THE REMAINING STEMS)

ALSO OBSERVED OUT OF THE PLOTS: PURPLE LOOSETRIFE

]

PROFILE 1
0589316 4653742

| HEIGHT | DISTANCE |
|--------|----------|
| 50 | 43 |
| 40 | 26 |
| 30 | 29 |
| 20 | 27 |
| 10 | 40 |

PROFILE 2
0589316 4653737

| HEIGHT | DISTANCE |
|--------|----------|
| 80 | 54 |
| 70 | 51 |
| 60 | 67 |
| 50 | 64 |
| 40 | 62 |
| 30 | 42 |
| 20 | 35 |
| 10 | 26 |

PROFILE 3
0589394 4653719

| HEIGHT | DISTANCE |
|--------|----------|
| 65 | 70 |
| 60 | 82 |
| 50 | 87 |
| 40 | 96 |
| 30 | 87 |
| 20 | 82 |
| 10 | 78 |

PROFILE 4
0589395 4653716

| HEIGHT | DISTANCE |
|--------|----------|
| 65 | 108 |
| 60 | 99 |
| 50 | 74 |
| 40 | 60 |
| 30 | 58 |
| 20 | 51 |
| 10 | 50 |

PROFILE 5
0589399 4653726

| HEIGHT | DISTANCE |
|--------|----------|
| 45 | 79 |
| 40 | 67 |
| 30 | 61 |
| 20 | 51 |
| 10 | 47 |

PROFILE 6
0589400 4653728

| HEIGHT | DISTANCE |
|--------|----------|
| 80 | 124 |
| 70 | 112 |
| 60 | 108 |
| 50 | 86 |
| 40 | 64 |
| 30 | 52 |
| 20 | 39 |
| 10 | 23 |

PROFILE 7
0589400 4653731

| HEIGHT | DISTANCE |
|--------|----------|
| 45 | 70 |
| 40 | 65 |
| 30 | 53 |
| 20 | 43 |
| 10 | 38 |

PROFILE 8
0589399 4653733

| HEIGHT | DISTANCE |
|--------|----------|
| 75 | 80 |
| 70 | 70 |
| 60 | 68 |
| 50 | 60 |
| 40 | 44 |
| 30 | 28 |
| 20 | 19 |
| 10 | 3 |

PROFILE 9
0589402 4653734

| HEIGHT | DISTANCE |
|--------|----------|
| 60 | 72 |
| 50 | 53 |
| 40 | 80 |
| 30 | 49 |
| 20 | 34 |
| 10 | 28 |

PROFILE 10
0589404 4653735

| HEIGHT | DISTANCE |
|--------|----------|
| 70 | 94 |
| 60 | 86 |
| 50 | 79 |
| 40 | 71 |
| 30 | 53 |
| 20 | 42 |
| 10 | 31 |

| | Vallisneria | Millfoil | Zoosterella | Hoja I | Hoja II |
|----|-------------|----------|-------------|--------|---------|
| 1 | 16.14 | | 20.4 | | |
| 2 | 4.53 | 5.53 | 21.12 | 1.66 | |
| 3 | 7.9 | 11.79 | | 2.47 | |
| 4 | 37.73 | 2.34 | | | 2.7 |
| 5 | 39.49 | | 29.65 | | |
| 6 | 40.54 | 38 | | | 2.02 |
| 7 | 25.25 | | 17.31 | | |
| 8 | 31.79 | 2.54 | 18.04 | 1.71 | 1.53 |
| 9 | 71.2 | | | | |
| 10 | 130.16 | | 20.16 | | |

| | Vallisneria | Millfoil | Zoosterella | Hoja I | Hoja II |
|----|-------------|----------|-------------|--------|---------|
| 1 | 7.19 | | 6.34 | | |
| 2 | 3.08 | 3.04 | 5.38 | 1.58 | |
| 3 | 4.16 | 4.22 | | 2.25 | |
| 4 | 6.88 | 1.75 | | | 2.28 |
| 5 | 7.82 | | 7.2 | | |
| 6 | 10.61 | 8.82 | | | 1.83 |
| 7 | 8.19 | | 5.72 | | |
| 8 | 7.6 | 1.2 | 6.54 | 1.52 | 1.33 |
| 9 | 15.24 | | | | |
| 10 | 23.54 | | 6.92 | | |

| | Vallisneria | Millfoil | Zoosterella | Hoja I | Hoja II |
|----|-------------|----------|-------------|--------|---------|
| 1 | 8.95 | 0 | 14.06 | 0 | 0 |
| 2 | 1.45 | 2.49 | 15.74 | 0.08 | 0 |
| 3 | 3.74 | 7.57 | 0 | 0.22 | 0 |
| 4 | 30.85 | 0.59 | 0 | 0 | 0.42 |
| 5 | 31.67 | 0 | 22.45 | 0 | 0 |
| 6 | 29.93 | 29.18 | 0 | 0 | 0.19 |
| 7 | 17.06 | 0 | 11.59 | 0 | 0 |
| 8 | 24.19 | 1.34 | 11.5 | 0.19 | 0.2 |
| 9 | 55.96 | 0 | 0 | 0 | 0 |
| 10 | 106.62 | 0 | 13.24 | 0 | 0 |

RANGE

E-W N-S
0588959 4654525
0588957 4654460

| SAMPLE | VALLISNE | MYRIOPH' | ZOOSTER | BROAD-LE | BROAD-LEAVED II |
|--------|----------|----------|---------|----------|-----------------|
| 1 | 0 | 0 | 0 | 0.39 | 0 |
| 2 | 52.99 | 0 | 0 | 0 | 0 |
| 3 | 17.45 | 0 | 0 | 0 | 0 |
| 4 | 2.81 | 2.27 | 0 | 0 | 0 |
| 5 | 10.07 | 0 | 0 | 0 | 0 |
| 6 | 6.66 | 0 | 0 | 0 | 0 |
| 7 | 57.45 | 0 | 0 | 0 | 0 |
| 8 | 0 | 10.41 | 0 | 0 | 0 |
| 9 | 37.69 | 0 | 0 | 0 | 0 |
| 10 | 36.13 | 11.55 | 0 | 0 | 0 |
| 11 | 7.06 | 3.51 | 0.28 | 0 | 0 |
| 12 | 0 | 0 | 0 | 0 | 0 |
| 13 | 0 | 0 | 0 | 0 | 0 |
| 14 | 0 | 0 | 0 | 0 | 0 |

BLI = Roun
BLII = More

ided
e elongated

| E-W | N-S | TOTAL | SENESCENCE | PICKERELWEED |
|---------|---------|-------|------------|--------------|
| 0588960 | 4654465 | 32 | 7 | 0 |
| 0588963 | 4654473 | 30 | 10 | 0 |
| 0588964 | 4654481 | 31 | 14 | 0 |
| 0588962 | 4654488 | 26 | 9 | 0 |
| 0588963 | 4654500 | 25 | 6 | 0 |
| 0588964 | 4654511 | 41 | 7 | 0 |
| 0588964 | 4654521 | 13 | 3 | 0 |
| 0588965 | 4654530 | 51 | 9 | 9 |
| 0588966 | 4654541 | 53 | 11 | 36 |
| 0588964 | 4654549 | 40 | 12 | 0 |

PLOT SIZE = 1 X 1 mts.

SENESCENT = STIFF STE
 STANDING-DEAD DECOM
 COMMUNED EDGES) PI
 SHOWING PARTIAL OR T
 SEDIMENTS AND A MORE

PLANTS SHOWING LEAVES WITH SIGNS OF
PROLONGED POSITION (CONCAVE LEAVES WITH
STEMS ROOTED BUT FALLEN STEMS
MAINTAINING CONTACT WITH THE BOTTOM
= ADVANCED STATE OF LEAF DECAY.

| E-W | N-S | NARROW CATTAIL | | BROAD CATTAIL | | NUPHAR | | SENESCE | ARROW A |
|---------|---------|----------------|----------|---------------|----------|--------|---|---------|---------|
| | | TOTAL | ST. DEAD | TOTAL | ST. DEAD | TOTAL | | | |
| 0588996 | 4654497 | 9 | 0 | 47 | 0 | 0 | 0 | 0 | 0 |
| 0588996 | 4654496 | 1 | 0 | 73 | 9 | 0 | 0 | 0 | 0 |
| 0588991 | 4654499 | 24 | 5 | 0 | 0 | 1 | 0 | 0 | 0 |
| 0588987 | 4654498 | 23 | 4 | 0 | 0 | 1 | 0 | 0 | 4 |
| 0588985 | 4654502 | 6 | 0 | 49 | 0 | 0 | 0 | 0 | 0 |
| 0588979 | 4654503 | 5 | 4 | 0 | 0 | 3 | 0 | 0 | 11 |
| 0588978 | 4654506 | 4 | 1 | 18 | 6 | 0 | 0 | 0 | 0 |
| 0588973 | 4654508 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 21 |
| 0588972 | 4654511 | 4 | 1 | 22 | 0 | 0 | 0 | 0 | 4 |
| 0588973 | 4654516 | 54 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |

COMMON PICKEREL RICE CUT DOTTED S WATER HIBUGLEWEED

| | | | | | |
|----|---|---|---|---|---|
| 10 | 0 | 0 | 0 | 0 | 0 |
| 0 | 6 | 0 | 0 | 0 | 0 |
| 1 | 3 | 0 | 1 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 |

PLOTS = 50 X 50 cm.

ST. DEAD = COMPLE
 DRY STEMS WERE C
 VIRTUALLY ALL THE

ALSO OBSERVED OU
 CATTAIL, WILD RICE

PARTIALLY DRY STEMS (PARTIALLY
CONSIDERED ALIVE; I.E.
REMAINING STEMS)

JT OF THE PLOTS: BROADLEAF

| E-W | N-S | NARROW CATTAIL | | BROAD CATTAIL | | ARROW A | COMMON | JEWELWE |
|---------|---------|----------------|----------|---------------|----------|---------|--------|---------|
| | | TOTAL | ST. DEAD | TOTAL | ST. DEAD | | | |
| 0589000 | 4654500 | 21 | 0 | 0 | 0 | 6 | 0 | 18 |
| 0588995 | 4654501 | 20 | 6 | 0 | 0 | 24 | 0 | 2 |
| 0588992 | 4654503 | 4 | 0 | 48 | 2 | 0 | 4 | 0 |
| 0588988 | 4654502 | 5 | 1 | 24 | 0 | 12 | 0 | 1 |
| 0588985 | 4654506 | 31 | 4 | 15 | 0 | 19 | 0 | 6 |
| 0588981 | 4654505 | 14 | 0 | 0 | 0 | 25 | 0 | 1 |
| 0588981 | 4654510 | 16 | 0 | 5 | 0 | 25 | 0 | 0 |
| 0588980 | 4654511 | 12 | 2 | 0 | 0 | 9 | 0 | 3 |
| 0588977 | 4654514 | 18 | 3 | 5 | 0 | 2 | 0 | 1 |
| 0588973 | 4654513 | 13 | 0 | 0 | 0 | 21 | 0 | 1 |

WATER PLOTTED RICE CUTGRASS

| | | |
|---|---|----|
| 1 | 0 | 0 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| 0 | 2 | 0 |
| 0 | 0 | 0 |
| 0 | 0 | 10 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| 0 | 1 | 3 |
| 0 | 0 | 3 |

PLOTS = 50 X 50 cm.

ST. DEAD = COMPLETELY DRY STEMS (PARTIALLY DRY STEMS WERE CONSIDERED ALIVE; I.E. VIRTUALLY ALL THE REMAINING STEMS)

ALSO OBSERVED OUT OF THE PLOTS: PURPLE LOOSETRIFE

]

PROFILE 1
0589316 4653742

PROFILE 2
0589316 4653737

PROFILE 3
0589394 4653719

HEIGHT DISTANCE

HEIGHT DISTANCE

HEIGHT DISTANCE



PROFILE 4
0589395 4653716

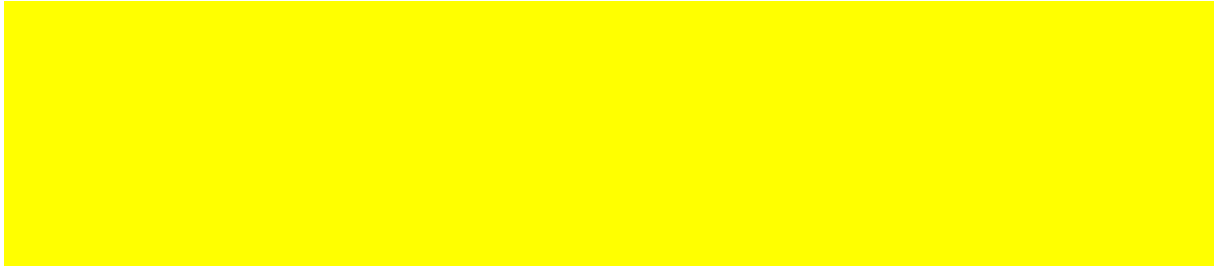
PROFILE 5
0589399 4653726

PROFILE 6
0589400 4653728

HEIGHT DISTANCE

HEIGHT DISTANCE

HEIGHT DISTANCE



PROFILE 7
0589400 4653731

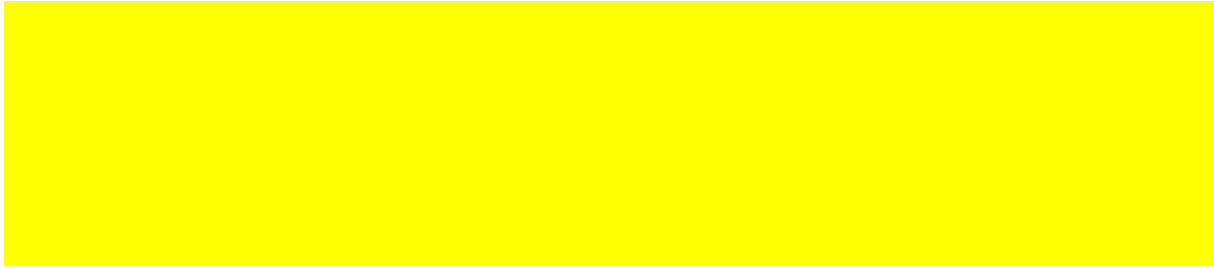
PROFILE 8
0589399 4653733

PROFILE 9
0589402 4653734

HEIGHT DISTANCE

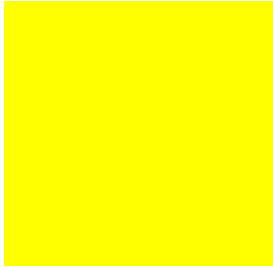
HEIGHT DISTANCE

HEIGHT DISTANCE



PROFILE 10
0589404 4653735

HEIGHT DISTANCE



| | Vallisneria | Millfoil | Zoosterella | Hoja I | Hoja II |
|----|-------------|----------|-------------|--------|---------|
| 1 | 16.14 | | 20.4 | | |
| 2 | 4.53 | 5.53 | 21.12 | 1.66 | |
| 3 | 7.9 | 11.79 | | 2.47 | |
| 4 | 37.73 | 2.34 | | | 2.7 |
| 5 | 39.49 | | 29.65 | | |
| 6 | 40.54 | 38 | | | 2.02 |
| 7 | 25.25 | | 17.31 | | |
| 8 | 31.79 | 2.54 | 18.04 | 1.71 | 1.53 |
| 9 | 71.2 | | | | |
| 10 | 130.16 | | 20.16 | | |

| | Vallisneria | Millfoil | Zoosterella | Hoja I | Hoja II |
|----|-------------|----------|-------------|--------|---------|
| 1 | 7.19 | | 6.34 | | |
| 2 | 3.08 | 3.04 | 5.38 | 1.58 | |
| 3 | 4.16 | 4.22 | | 2.25 | |
| 4 | 6.88 | 1.75 | | | 2.28 |
| 5 | 7.82 | | 7.2 | | |
| 6 | 10.61 | 8.82 | | | 1.83 |
| 7 | 8.19 | | 5.72 | | |
| 8 | 7.6 | 1.2 | 6.54 | 1.52 | 1.33 |
| 9 | 15.24 | | | | |
| 10 | 23.54 | | 6.92 | | |

| | Vallisneria | Millfoil | Zoosterella | Hoja I | Hoja II |
|----|-------------|----------|-------------|--------|---------|
| 1 | 8.95 | 0 | 14.06 | 0 | 0 |
| 2 | 1.45 | 2.49 | 15.74 | 0.08 | 0 |
| 3 | 3.74 | 7.57 | 0 | 0.22 | 0 |
| 4 | 30.85 | 0.59 | 0 | 0 | 0.42 |
| 5 | 31.67 | 0 | 22.45 | 0 | 0 |
| 6 | 29.93 | 29.18 | 0 | 0 | 0.19 |
| 7 | 17.06 | 0 | 11.59 | 0 | 0 |
| 8 | 24.19 | 1.34 | 11.5 | 0.19 | 0.2 |
| 9 | 55.96 | 0 | 0 | 0 | 0 |
| 10 | 106.62 | 0 | 13.24 | 0 | 0 |