

### Threats to Plummers Island from American Legion Bridge construction and expansion

#### 1) Damage to waterways:

- a) Potomac River shore: mud flats and sandbars are wetland features in the MDOT recalibrated (post the DEIS comments) Zone of Destruction.
- b) we don't know what the new and reconstructed bridge piers will do to flow along the river or channel, particularly if the point of rocks and Rock of Gibraltar (at the upper tip of the Island) are destroyed or significantly altered. Sand bars and mud flat habitats could be substantially reduced for plants and animals that depend on these.
- c) the Island Channel (AKA "Rock Run Culvert"). The head of the channel down to the dog leg would not see daylight for years of construction. After which this part of the Channel would be overshadowed by the 2 added lanes on the Island side of the Bridge. What are the consequences to waterways there and downstream?
- d) with the Channel covered by planking for the construction platform, high and mid-level floods will be redirected over those onto the Island flood plain, potentially adversely affecting much of that flood plain.
- e) if sub-point d happens, all research plots in the flood plain could be substantially altered, (including vegetation plots 1, 3, 9, 10, 11, 12, and habitats for plants and animals)
- f) the "frog water" pools at the head of the island noted in the DEIS and circumscribed in subsequent documents are highly vulnerable to disturbance (vegetation plot 3 is in this zone).
- g) Zone of potential effects/disturbance uncertain, but estimated by DEIS to be 2/5 of the Island. What is the MDOT plan for protecting this zone?
- h) Amphibians are in global and local decline due to pollution, diseases, ozone, and habitat destruction. Eleven species of amphibians are known from Plummers Island (Manville 1968 and <https://collections.nmnh.si.edu/search/herps/>): *Acris crepitans*, northern cricket frog; *Hyla versicolor*, eastern gray treefrog; *Lithobates clamitans*, green tree frog; *Lithobates palustris*, pickerel frog; *Lithobates sylvaticus*, wood frog; *Pseudacris crucifer*, spring peeper; *Pseudacris feriarum*, upland chorus frog; *Ambystoma maculatum*, spotted salamander; *Eurycea longicauda longicauda*, long-tailed salamander; *Hemidactylium scutatum*, four-toed salamander; *Notophthalmus viridescens viridescens*, eastern newt; *Pseudotriton ruber*, northern red salamander.

#### 2) Destruction of rare plants (Simmons et al. 2020) and rare plant communities (Simmons et al. 2016) from the far west end of the Island within the Zone of Destruction:

- a) *Hibiscus laevis* (mud flats just below and above point of rocks)
- b) *Solidago racemosa* (point of rocks, below Rock of Gibraltar)
- c) *Hypericum prolificum* (point of rocks, below Rock of Gibraltar)
- d) *Paspalum fluitans* (mud flats just below and above point of rocks)

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e) other native plants rare on the island occurring only on west end in Zone of Destruction: e.g., *Sedum ternatum*. (on Rock of Gibraltar)

f) Piedmont / Central Appalachian Sand Bar / River Shore (Low Herbs Type): *Eragrostis hypnoides* - *Lindernia dubia* - *Ludwigia palustris* - *Cyperus squarrosus* Herbaceous Vegetation (USNVC: CEGLO06483). Non-tidal mudflats. Global/State Ranks: G3/SNR (Simmons et al. 2016)

g) Potomac Gorge Riverside Outcrop Barren (Potomac Gorge Type): (*Hypericum prolificum*, *Eubotrys racemosa*) / *Schizachyrium scoparium* - *Solidago racemosa* - *Ionactis linariifolia* Herbaceous Vegetation (USNVC: CEGLO06491). Global/State Ranks: G2/S1.

3) Destruction of WBFC research plots:

a) Vegetation research plots from 1997 and 2013-2015 will be destroyed (plots 4, 5, on the sandbar at the head of the Island will be totally destroyed [see also 1) e]), A historic National Park Service vegetation plot on the Potomac River sandbar could be destroyed.

4) Destruction of past collection sites:

a) many plants and animals were vouchered or recorded from the west end of the Island, some are only known on the Island from there.

5) Habitat destruction and disturbance lead to more invasive organisms:

a) the west end of the Island is covered in a tangle of oriental bittersweet (first vouchered in 1982), and shrubs of amur honeysuckle (first vouchered in 1997), among many other invasive plants recorded there. Invasive species establishment and expansion will be sorely exacerbated by disturbance involved the construction process.

6) Potential for catastrophic destruction from major floods if water barriers and/or construction platforms emplaced for construction blow out. Construction timbers potentially could rip out acres of trees and other vegetation in the Island flood plain. **Note 1:** 51 out of the 100 recorded historic Potomac River floods (over 9.4 ft at Little Falls Gauge, NOAA data) were recorded since the first bridge was built in 1962, 33 since the midsection of the bridge was filled in 1992, 1996 included two of the top 7 floods, and 2018 included 4 historic floods. In 2019 the Island flood plain was inundated on and off for much of winter and spring. **Note 2:** Mather Gorge (Cohn 2004) is much narrower at the ALB and Plummers Island than at Little Falls Gauge, so the high-water marks listed below substantially underestimate the peak flows at the bridge and head of Island.

rank	height	ft	date	54	11.44	ft	9/21/2003	
	5	19.29	ft	1/21/1996	58	11.3	ft	5/20/2011
	7	17.84	ft	9/8/1996	61	11.17	ft	1/27/2010
	31	12.82	ft	3/15/2010	65	11.01	ft	9/29/2018
	36	12.38	ft	6/5/2018	66	10.88	ft	3/12/2011
	37	12.35	ft	3/6/1993	67	10.87	ft	12/12/2003
	46	11.7	ft	5/18/2014	68	10.85	ft	9/11/2018
	47	11.68	ft	4/18/2011	70	10.79	ft	3/22/1998
	50	11.56	ft	12/17/2018	77	10.55	ft	4/18/1993

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81	10.43	ft	1/10/1998	95	10.09	ft	11/29/1993
82	10.37	ft	3/30/1994	96	10.04	ft	5/13/2008
86	10.33	ft	10/31/2012	97	9.97	ft	9/23/2003
87	10.28	ft	3/30/2005	98	9.78	ft	9/9/2011
90	10.16	ft	3/25/1993	99	9.67	ft	5/6/2009
92	10.13	ft	1/29/1993	100	9.43	ft	4/17/2007

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7) Sound from bridge construction and closer proximity of traffic in 2 new bridge lanes after they open on the bridge:

a) The noise factor cannot be ignored by humans or wildlife. Already the sound of traffic is disturbing to human conversation at our meeting place the WBFC Cabin grounds.

8) Salt and oil runoff impacts on biota from the bridge:

a) This depends on where the outflow is drained from the bridge drainage scuppers

b) The unintended consequences of that volume of road salts on freshwater ecosystems can be severe. A colleague is working on this very subject on area highways, and the impacts he found were surprisingly devastating. One of the worst impacts was mobilizing (and making bioavailable) toxic metals in waterways.

10) Violation of long-term continuity of 120 years of research (Perry 2007; Shetler et al. 2006):

a) lichen study on Plummers Island validated essentiality of long-term research contributing to National and global removal of Lead from gasoline: A drop from 70 species to 20 species due to sensitivity to Lead pollution on the Island (Lawrey & Hale 1979).

b) the decline of forest breeding birds on Plummers Island is related to the Bridge (Johnston & Winings 1987).

c) Insects, like other organisms, are experiencing major declines globally (Borenstein 2018; Hallman et al. 2017; Jarvis 2018; Vogel 2017). Giant silk moths (Saturniidae) include Imperial, Cercropia, Luna, Polyphemus, Royal Walnut, Rosy maple etc. In New England, most of these are state endangered species because they have been hammered by an introduced biocontrol agent -- a non-native tachinid fly, *Compsilura concinna*, which was introduced to try and control gypsy moths in Massachusetts. That fly has wreaked havoc in New England because it is a generalist and the Saturniids have been heavily impacted. This pest has arrived in DC and vicinity but impacts here are not yet known (John Lil pers. comm. 2020). Thanks to the long history of research on insects of Plummers Island (more than 3000 species documented there; Brown & Bahr 2008a,b), the Island is a key place to further document this aspect of "insect apocalypse" (Jarvis 2018) assuming the Island remains intact. Erwin (1981) and Brown (2001) have documented long-term trends in beetles and moths, respectively, with shifts in species composition related mainly to vegetation succession. The ALB project puts WBFC Plummers Island research on trends in biodiversity in jeopardy.

**d)** bellwether issues of plagues, invasions and expansion of exotic species are expected to be exacerbated due to disturbance from construction – some examples of timing of introductions spread, and manifestations of infestations of plants animals, and diseases from around the region are recorded from Plummers Island (plant records from Shetler et al. 2006, WBFC Invasive Biota Committee reports 2015-2020), and <https://collections.nmnh.si.edu/search/botany/>

- i) arrival and expansion of garlic mustard (1915), now rampant
- ii) arrival and expansion of tree of heaven (or hell) (1933), now 50+ trees
- iii) arrival and expansion of Japanese honeysuckle (1949), now dominant
- iv) arrival and expansion of Japanese stilt grass (1979), now locally dominant
- v) arrival and expansion of oriental bittersweet (1982), now all over and covering trees
- vi) arrival and expansion of amur honeysuckle (1997), now dominant on west end
- vii) arrival and expansion of winter creeper (1997), now patchily established but potentially widespread
- viii) arrival and expansion of ivy (ca 2015), now patchily established but potentially widespread
- ix) Emerald Ash Borer (EAB) arrival and expansion in 2015 and death of ash trees (2016), mass die off of ash trees, a major shift in forest climax community (Simmons et al. 2016)
- x) fig buttercup arrival and expansion and expansion (3 plants 2017, 50 plants in 2019, 160 plants 2020), expanding exponentially
- xi) arrival and expansion of European and Asian earthworms, which rapidly consume forest detritus and restructure soils, upending soil ecological processes and networks of indigenous species adapted to them, favoring colonization and replacement by invasive species, [https://en.wikipedia.org/wiki/Invasive\\_earthworms\\_of\\_North\\_America](https://en.wikipedia.org/wiki/Invasive_earthworms_of_North_America)
- xii) arrival and expansion of Asian clams (*Corbicula fluminea*), shells now abundant in sandy soils across the island (arrived in Ohio River Valley ca 1959, established in the Potomac River by 1982)
- xiii) Chestnut blight, was discovered in the USA in New York in 1904, arrived in Maryland by 1906, Chestnuts were historically on Plummers Island adjacent mainland, last documented in 1934, but considered extinct there by 1935. This once dominant species of the eastern deciduous forest was mostly wiped out within 50 years.
- xiv) Beech blight is coming. Popkin (2019) documents a deadly beech disease is spreading in the northeast USA. There is a mature beech forest on the mainland side of Plummers Island, near Lock 12. We will be watching for the blight here, unless the forest is cut down for the Bridge construction.

- c) Following climate change impacts to the ecosystems on Plummers Island will be conflated with issues involved with disturbance from bridge construction and emplacements.

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