Supplemental Data

Proof-of-concept studies demonstrate that food and pheromone stimuli can be used to attract invasive carp so their presence can be readily measured using environmental DNA

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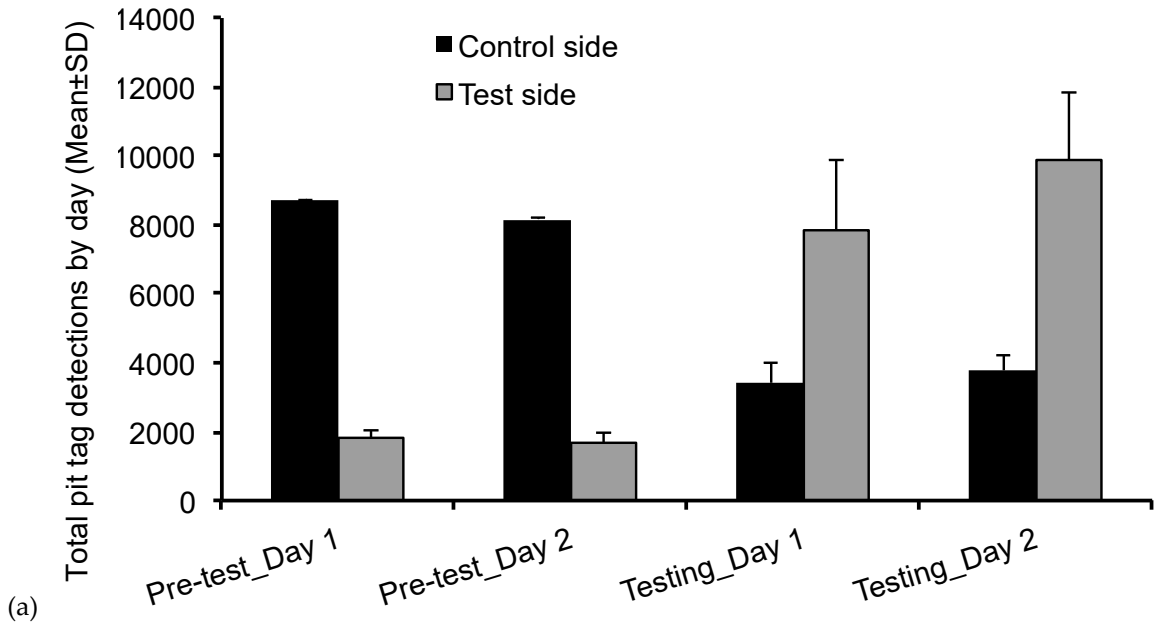
Supplemental Data S1

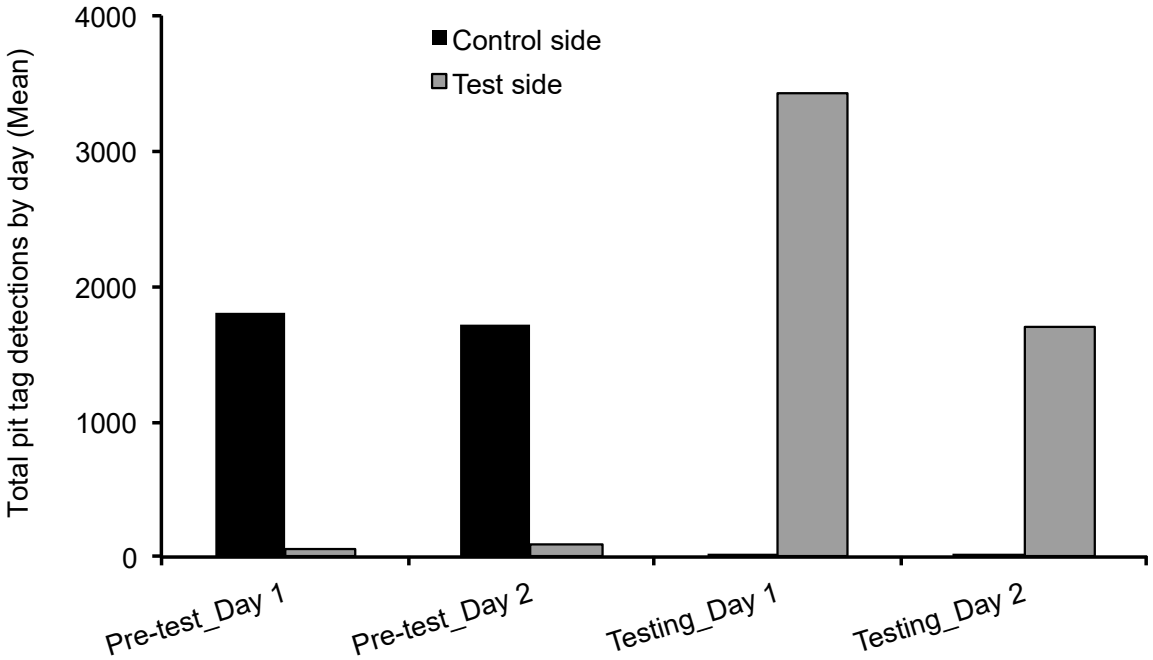
Preparation of PGF odor:

PGF2α is one of the major components of the 'pheromone complex' released by ovulating female Common Carp along with additional body and $PGF_{2\alpha}$ metabolites (Lim and Sorensen 2011). Both the pheromone mixture / complex and PGF2α alone are potent at attracting male conspecifics. In this proof-of-concept study we tested both PGF2α alone and the 'pheromone complex' because we did not know which might work. Following established protocols, the complex was made using holding water of PGF2α-implanted Common Carp, while the other experiment used only PGF2α. For $PGF_{2\alpha}$ implantation for the complex, adult Common Carp (500–1000g) were anesthetized and osmotic pumps (model 2ML1; Alzet, Durect Co., Cupertino, CA, USA) containing PGF2α were implanted into the body cavity by making an approximately 4 cm incision. Based on Lim and Sorensen (2010), the dose of PGF2α was 0.4 g/kg Carp, and the surgical methods followed protocols described by Lim and Sorensen (2010). Using this technique, we already knew that release rates of PGF2α peak on the 5th day post-implantation (Lim and Sorensen 2011) so holding water of PGF2α -implanted fish was released into the ponds on 5th and 6th day. To collect holding water, a PGF2α-implanted carp was held in 50l well water at 21°C for 12 hours, and the holding water was diluted at 1:100 ratio before releasing into the ponds. The concentration of PGF2α in the diluted holding water was determined to be 10^{-9} M using the standardized LC-MS protocol as described in Ghosal et al. (2018) and Lim and Sorensen (2011).

Supplemental Figure S1



(a)



(b)

Figure S1. (a) Total number of detections (Mean ± SD) of silver carp by day at the test and control sides during pre-test (with no spirulina addition at the test side of the pond) and testing periods (during spirulina addition at the test side of the pond) pooled across ponds (N = 3). (b) Total number of detections (Mean) of common carp at the test and control sides during pre-test (with no PGF2α addition at test side of the pond) and testing periods (during PGF2α addition at test side of the pond). .