# Supplemental Information

## Habitat preference, movements and growth of Giant mottled eels, *Anguilla marmorata*, in a small subtropical Amami-Oshima island river

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**Table S1.** Fish and crustacean species found in the Oganeku River on Amami-Oshima Island, Japan, during the sampling surveys of the present study. The capture locations (i.e., downstream or upstream) of fish and crustacean species was defined depending on whether they were captured at more downstream or upstream locations relative to about 320 m from the river mouth where the riverscape greatly changed to higher-gradient upstream environments. Fishes and crustaceans were more abundant in downstream reaches of the river. The gobies (*Rhinogobius nagoyae* and *Sicyopterus japonicus*) and freshwater prawn (*Macrobrachium japonicum*) tended to be the more frequently encountered species.

| Category | Species | Common name | Migratory type | Capture location |
|---|---|---|---|---|
| Fish | *Anguilla japonica* | Japanese eel | Diadromous | Downstream |
| Fish | *A. marmorata* | Giant mottled eel | Diadromous | Both |
| Fish | *Microphis leiaspis* | Pipefish | Diadromous | Downstream |
| Fish | *M. brachyurus* | Pipefish | Diadromous | Downstream |
| Fish | *Mugil cephalus* | Mullet | Diadromous | Downstream |
| Fish | *Chelon affinis* | Mullet | Diadromous | Downstream |
| Fish | *C. macrolepis* | Mullet | Diadromous | Downstream |
| Fish | *Kuhlia marginata* | Flagtail | Diadromous | Downstream |
| Fish | *K. rupestris* | Jungle perch | Diadromous | Downstream |
| Fish | *Acanthopagrus sivicolus* | Okinawa seabream | Diadromous | Downstream |
| Fish | *Eleotris acanthopoma* | Spinecheek gudgeon | Diadromous | Downstream |
| Fish | *E. fusca* | Dusky sleeper | Diadromous | Both |
| Fish | *E. melanosoma* | Broadhead sleeper | Diadromous | Downstream |
| Fish | *Yongeichthys criniger* | Goby | Diadromous | Downstream |
| Fish | *Redigobius bikolanus* | Speckled goby | Diadromous | Downstream |
| Fish | *Rhinogobius giurinus* | Goby | Diadromous | Downstream |
| Fish | *R. nagoyae* | Goby | Diadromous | Downstream |
| Fish | *R. brunneus* | Goby | Diadromous | Both |
| Fish | *R. yonezawai* | Goby | Diadromous | Upstream |
| Fish | *Tridentiger kuroiwae* | Goby | Diadromous | Downstream |
| Fish | *Luciogobius guttatus* | Flat-headed goby | Diadromous | Downstream |
| Fish | *Sicyopterus japonicus* | Goby | Diadromous | Both |
| Fish | *S. lagocephalus* | Red-tailed goby | Diadromous | Downstream |

| | | | | |
|---|---|---|---|---|
| Fish | *Sicyopus zosterophorum* | Goby | Diadromous | Upstream |
| Crustacea | *Eriocheir japonica* | Japanese mitten crab | Diadromous | Both |
| Crustacea | *Macrobrachium lar* | Freshwater prawn | Diadromous | Upstream |
| Crustacea | *M. formosense* | Freshwater prawn | Diadromous | Downstream |
| Crustacea | *M. japonicum* | Freshwater prawn | Diadromous | Both |
| Crustacea | *M. gracilirostre* | Freshwater prawn | Diadromous | Upstream |
| Crustacea | *Caridina serratirostris* | Marsh shrimp | Diadromous | Downstream |
| Crustacea | *C. multidentata* | Marsh shrimp | Diadromous | Upstream |
| Crustacea | *C. typus* | Marsh shrimp | Diadromous | Both |
| Crustacea | *C. leucosticta* | Marsh shrimp | Diadromous | Downstream |

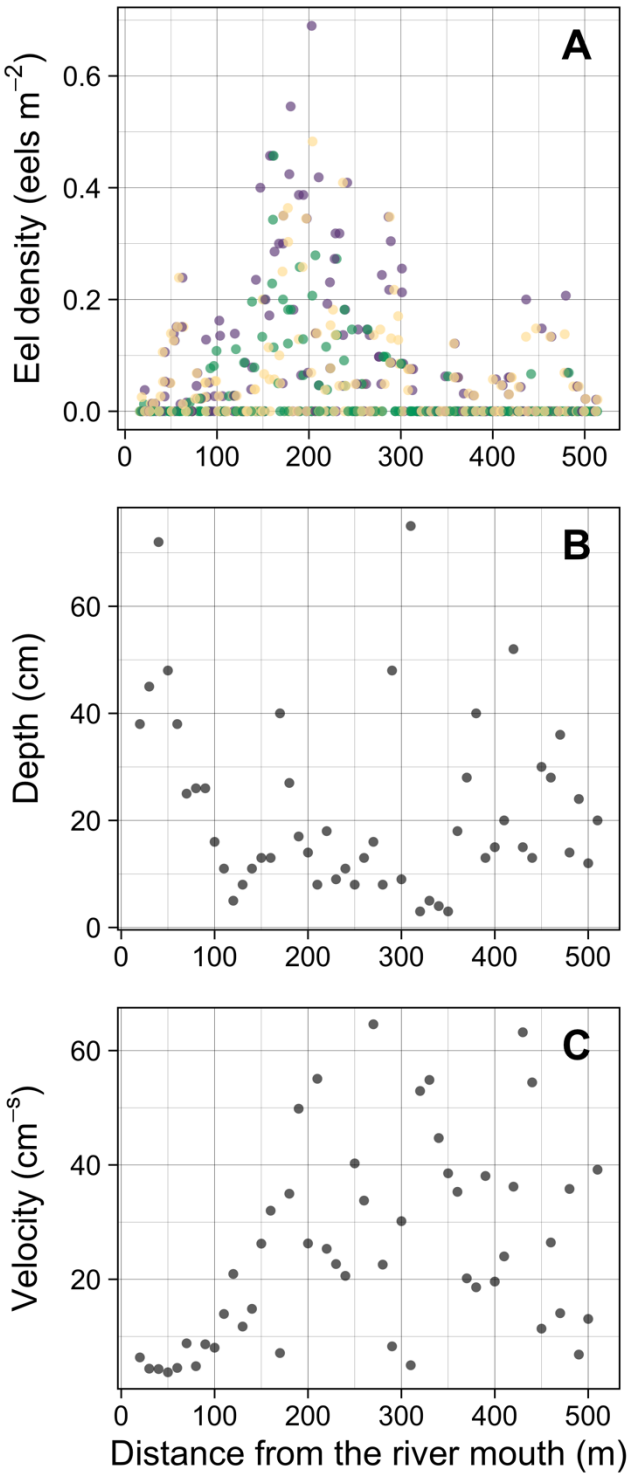


**Figure S1.** Relationships between distance from the river mouth and (A) *A. marmorata* density, (B) depth, and (C) velocity in sampling sections in the Oganeku River on Amami-Oshima Island, Japan.

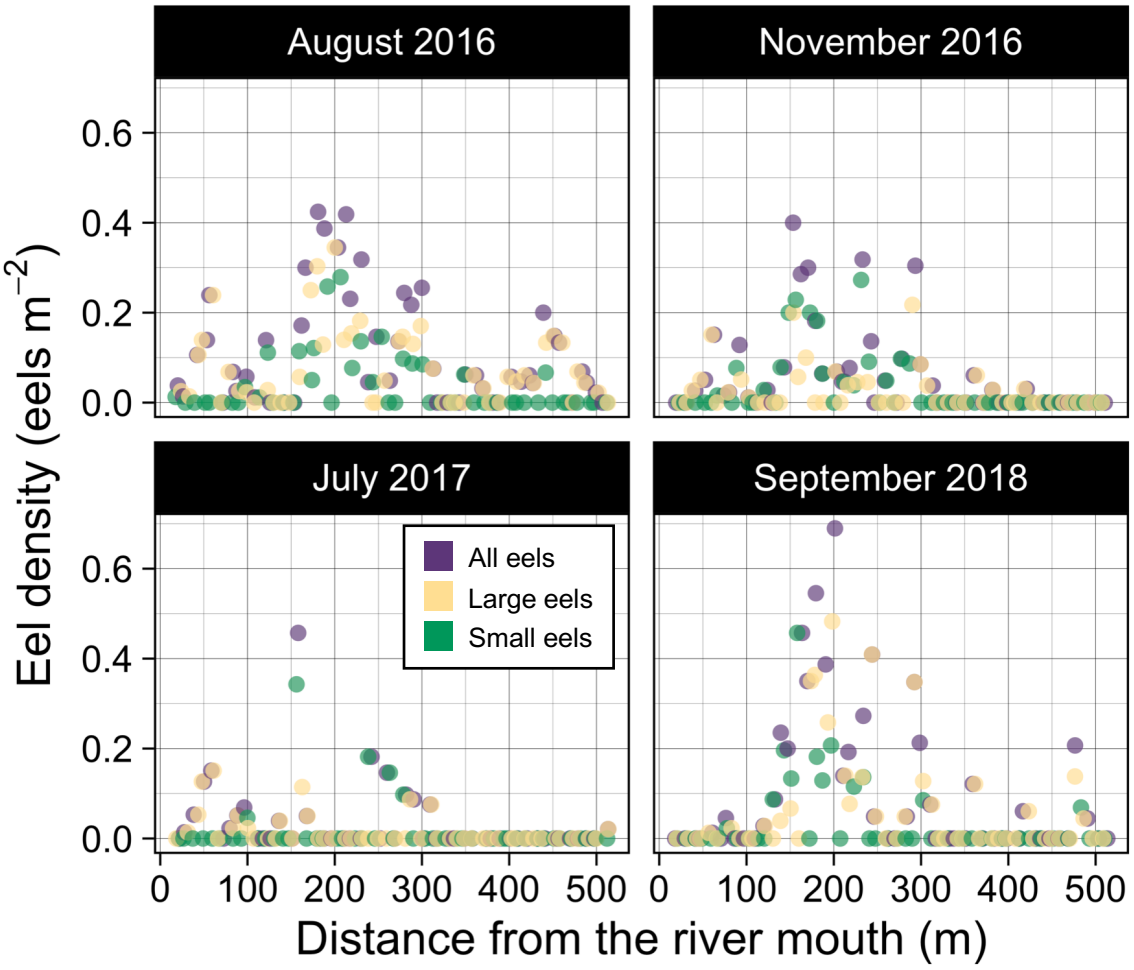


**Figure S2.** Density of *A. marmorata* in relation to the distance from the river mouth in the Oganeku River on Amami-Oshima Island, Japan during each of the 4 sampling periods.

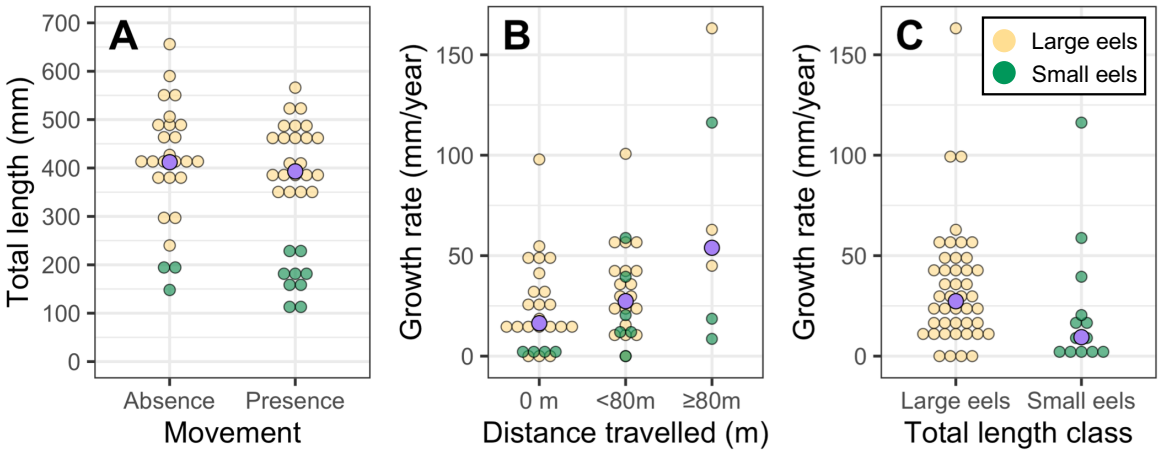


**Figure S3.** Total length or growth rate distribution of *A. marmorata* caught in the Oganeku River on Amami-Oshima Island, Japan, among (A) eels that moved or did not move, (B) eels that moved 0 m, <80 m, or moved ≥80 m, and (C) total length class. The purple circles denote median values.

The longest upstream movements were made by 3 small eels that moved from the 100 m section with gravel substrate and concrete and vegetated riverbanks to more upstream sections. There were 121 and 170 mm eels caught and tagged during the first sampling that were then captured 140 and 130 m upstream after 353 and 85 days at sizes of 139 and 172 mm (18.6, 8.6 mm/year GR), respectively. The longest movement was made by a 172 mm eel that was captured 424 days later and 380 m upstream at a size of 307 mm (116.2 mm/year GR).

The first two eels moved into gravel substrate and concrete and vegetated riverbanks habitats and the long movement eel moved to a boulder habitat section near the headwaters of the river. Three of the 4 fastest growing eels had made movements (380, 80, 40 m) and had inhabited mud, gravel, or boulder sediments and boulder riverbank habitats. These were 172, 417, and 566 mm eels that were caught and tagged during the first sampling period that were then captured after 424, 85 and 87 days at sizes of 307, 455 and 590 mm (116.2, 163.2, and 100.7 mm/year GR), respectively.

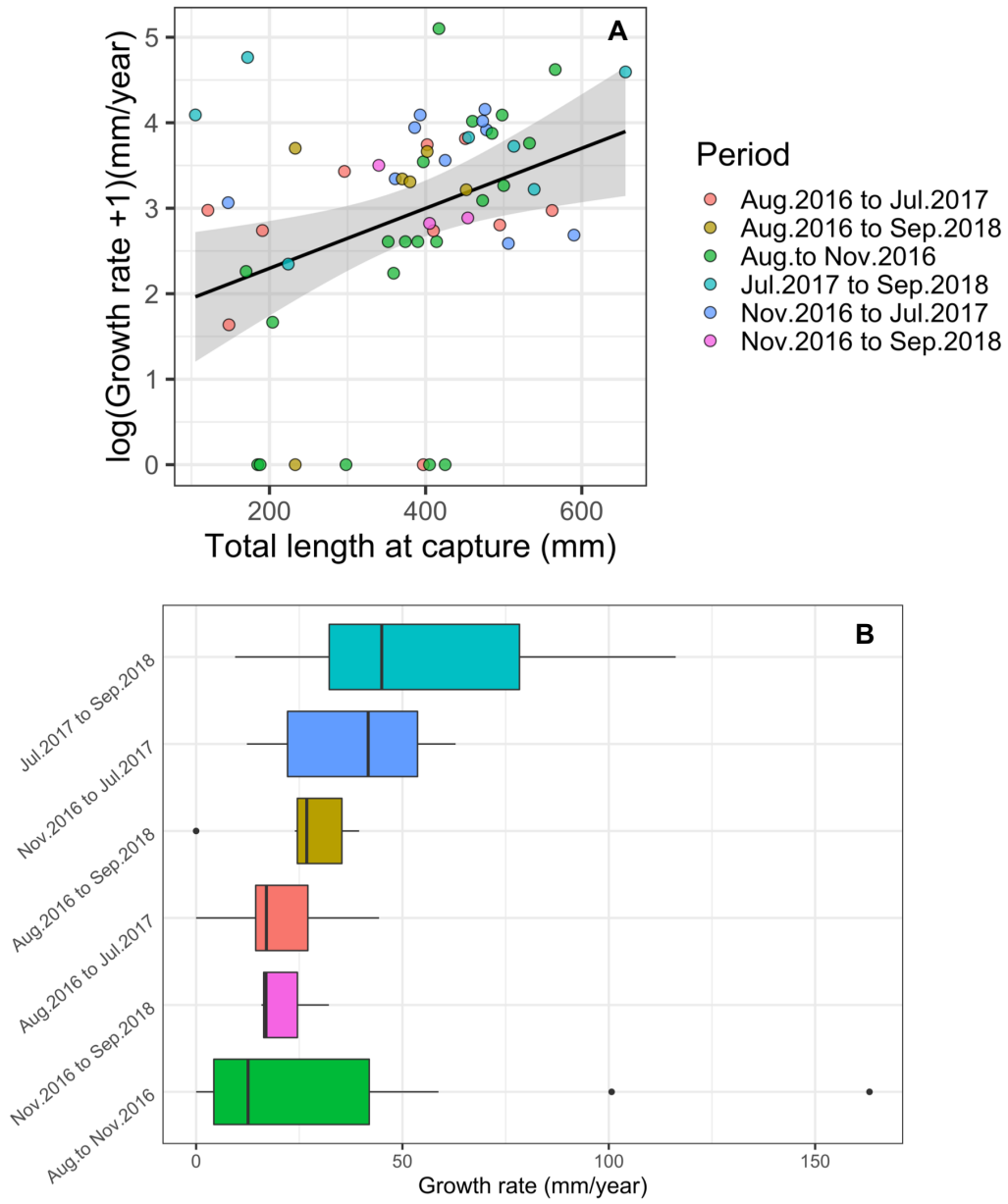


**Figure S4.** The relationship between total length at capture and growth rate (GR) of *A. marmorata* caught in the Oganeku River on Amami-Oshima Island, Japan, and the GR of eels during each study period between capture (marked) and recapture. The line and shaded area in (A) indicate the regression line and 95% intervals of the generalized linear model, respectively. In the boxplots (B), the middle lines indicate the median, the boxes represent the 0.25 and 0.75 quartiles, the whiskers are the values that are within 1.5 of the interquartile range, and the dots show outliers.