Movement patterns of gray triggerfish, *Balistes capriscus*, around artificial reefs in the northern Gulf of Mexico

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Abstract Little is known about the movement patterns of gray triggerfish, Balistes capriscus Gmelin, in the northern Gulf of Mexico. To examine fine scale movements, gray triggerfish (n = 17) were tagged with transmitters and tracked with the VR2W Positioning System (VPS) from 17 Oct 2012 to 9 Dec 2013. Most (76 %) tagged fish survived and were tracked for 1 to 57 weeks. Tagged fish showed significantly larger home ranges and core areas in autumn than winter-spring and during day than night. Seasonal movement patterns were positively correlated with water temperature. Gray triggerfish stayed close to the reef (mean ± SD distance = 35.9 ± 28.4 m), showed high site fidelity (64 %) and high residency (> 57 weeks). These patterns emphasize the importance of structured habitat for this species and suggest that artificial reef building in the northern Gulf of Mexico has enhanced this population.

Keywords: artificial reefs, kernel density, movement, residency, survival, telemetry

Introduction

Gray triggerfish, Balistes capriscus Gmelin, support an important sport and commercial fishery in the Gulf of Mexico (Simmons & Szedlmayer 2011; Simmons & Szedlmayer 2012; GMFMC 2012). Gray triggerfish have become even more important in recent years due to greater restrictions on other targeted species. For example, a short 10-day sport season in 2015 for red snapper, Lutjanus campechanus (Poey), likely caused fishers to shift effort to gray triggerfish, which previously did not experience heavy fishing pressure (Vale et al. 2001).

Presently, gray triggerfish in the Gulf of Mexico is considered overfished (SEDAR 2015). A management plan to rebuild the population was put in place in 2008 (SEDAR 2015). Although the interest in gray triggerfish has increased due to their increasing value, many important life history aspects are not well documented. In particular, little is known concerning the importance of structured habitats for gray triggerfish, either artificial- or natural-reef structures. Recent advances in telemetry technology now allow measurement of fine scale (within 1 m) movement patterns of gray triggerfish around these reefs. Telemetry studies will greatly improve our understanding of the importance of structured habitat for gray triggerfish and provide estimations of home range, habitat use and residency.

Few studies have examined movement patterns in Balistidae. One of the earliest studies externally tagged 58 gray triggerfish off the coast of Florida (Beaumariage 1969). Six of these tagged fish were captured by fishers at their release site. Ingram and Patterson (2001) externally tagged 206 gray triggerfish in the northern Gulf of Mexico and recaptured 42 fish; eight were recaptured more than once, 67 % were recaptured at their release site and 100 % were recaptured within 9 km of their release site. A similar study tagged 256 gray triggerfish on artificial reef sites off northwest Florida (Addis et al. 2007). They recaptured 40 fish, with 58 % caught at their release site and 100 % caught within 10 km of their release site. One study internally tagged six ocean triggerfish, Canthidermis sufflamen (Mitchill) and monitored their presence with a satellite-linked acoustic receiver attached to a fish aggregation device (FAD) in the Indian Ocean (Dagorn et al. 2007). These satellite tagged fish were only detected around the FAD for 15 days. Thus, very little is understood about gray triggerfish movement patterns and habitat associations.

In the present study, a Vemco VR2W positioning system (VPS, Vemco Ltd, Bedford, NS) was used to assess the use of structured habitat by gray triggerfish. These new VPS methods have proven successful with red snapper in the northern Gulf of Mexico (Piraino & Szedlmayer 2014; Williams & Szedlmayer in press). The present study examined whether gray triggerfish can survive transmitter implantation and behave "normally" and then applied VPS tracking methods to examine fine scale movements around artificial reefs. Such information could be used to examine important life history aspects in gray triggerfish that could aid management attempts to rebuild gray triggerfish stocks.

Methods

Study Area

Gray triggerfish were tagged on artificial reefs in the northern Gulf of Mexico 25 - 30 km south of Dauphin Island, Alabama (Fig. 1). Telemetry study sites were set up on two VPS artificial reefs: site R3 (depth 20 m) and site R4 (depth 27 m). These sites were selected because they had abundant (> 10) gray triggerfish needed for multiple tagging. Both reefs were 2.5 x 1.3 x 2.4 m steel cages. Receivers were also placed on 24 surrounding reefs of the same design (Fig. 1). The combination of VPS and surrounding reef sites with receivers allowed for continuous monitoring over a large area (64 km^2).

Fine-Scale Tracking

A VPS tracking array set up as per Piraino and Szedlmayer (2014) was used to record the fine-scale movements of tagged gray triggerfish. Each VPS site included an array of acoustic receivers (n = 5; Vemco VR2W), with all receivers positioned 4.5 m above the seafloor on anchored lines. At each VPS reef site, a receiver was positioned adjacent to the artificial reef (~ 20 m north, center receiver) and at 300 m north, south, east and west of center. Based on a 400-m detection range determined by Piraino and Szedlmayer (2014), this five-receiver array provided 100 % detection by at least three receivers of all transmitter signals within the 0.6 km^2 VPS array area. Fish positions were calculated by time differential of signal arrival at the different receivers through VEMCO post processing. Calibration of transmitter locations were previously verified by control transmitters and showed ~ 1 m accuracy of known transmitter positions (Piraino & Szedlmayer 2014). At each reef site, temperature loggers (n = 2, U22 Water Temp Pro v2, Onset HOBO, Bourne, MA) attached to the center receiver line at 4.5 m above and at the seafloor recorded water temperature at 1 h intervals. Synchronization transmitters (sync tags; Vemco V16-6x; 69 kHz; transmission delay 540-720 sec) were attached to receiver lines 1 m above all receivers to synchronize the receiver clocks, which is critical for accurate positioning of a tagged fish. A control transmitter (same type as used to tag fish) was also placed within the array and used to verify continuous detections of tagged fish (Topping & Szedlmayer 2011a; Piraino & Szedlmayer 2014). Transmitter detections were downloaded from the five receivers about every 3 months and processed by Vemco, which then reported fish positions.

In addition to the five receivers at each VPS site, single receivers (VR2W) were placed 1.3 - 1.7 km apart at 24 surrounding artificial reefs (Fig. 1). These receivers were deployed to validate emigrations away from VPS sites (identified by VPS tracking patterns within the VPS arrays) and to estimate the direction, distance and timing of emigrations. In addition, if tagged gray triggerfish established new residency on one of these surrounding reefs, residency time on these new reefs could be estimated.

Tagging Procedure

Adult gray triggerfish (> 250 mm fork length) were caught by hook-and-line, weighed, measured and anesthetised on the research vessel in a 70 L container of seawater and MS-222 (150 mg tricaine methanesulfonate L^{-1} seawater for 2 min). Fish were tagged and released on different days from 17 Oct 2012 to 13 Oct 2013 due to the difficulty of catching fish at the VPS reef sites and monitored from 17 Oct 2012 to 9 Dec 2013. Fish tagging procedures followed Topping & Szedlmayer (2011a, b). An individually coded acoustic transmitter (Vemco V13 - 1X – 069 - 1, 13 x 36 mm in length, 11 g in air) was implanted within the peritoneal cavity through a vertical incision on the left ventral side of the fish and the incision was closed with absorbable, sterile, plain gut surgical sutures (Ethicon 2 - 0 3.5 metric, Somerville, NJ). For visual identification, all fish were also marked with individually numbered internal anchor tags (Floy tags, Seattle, WA). After surgery, fish were held in a 185 L container of seawater on the research vessel until they showed signs of recovery (active fin and gill movements). All tagged gray triggerfish were released in predator protection cages lowered to the sea floor (Piraino & Szedlmayer 2014; Williams et al. 2015).

Data Analysis

Residence time of an active tagged fish was calculated with a known fate model in the MARK program (http://www.phidot.org/software/mark/docs/book/). The MARK program evaluated the proportion of fish that remained on an artificial reef over time based on the maximum likelihood binomial (MLE). This MLE estimated the Kaplan-Meier (K-M) survival function as if all fish had the same tagging start date (Kaplan & Meier 1958; Chambers & Leggett 1989; Edwards 1992; Ohta & Kakuma 2004; Schroepfer & Szedlmayer 2006; Topping & Szedlmayer 2011a). Median residence time was defined as the time period when 50 % of the tagged gray triggerfish were still present over the entire study period, and site fidelity was the percentage of tagged fish remaining at their release site 1 year after release (Schroepfer & Szedlmayer 2006; Topping & Szedlmayer 2011b). Both estimates are based on the residency analyses from conditional probabilities of surviving specified events (e.g. emigration). Fish were removed from the analysis (right censored) if they showed other events not under consideration (e.g. mortality). For example, when estimating residency or site fidelity a fish that emigrated or was caught by a fisher was removed from subsequent estimates in the following months. The residency function was based on weekly time intervals, the number of individuals at risk of undergoing an emigration, the number of individuals that did not undergo an emigration, the number that died and the MLE of remaining on a reef during each interval. Overall annual site fidelity was calculated by converting the total estimate (based on the longest track) to an annual estimate (52 weeks).

Kernel density estimates (KDE) of area use were calculated with the R program (R program, Vienna, Austria). Kernel density estimates produce a probability distribution that a tagged gray triggerfish will be located within a certain area during a specified time period (Seaman & Powell 1996; Topping et al. 2005; Piraino & Szedlmayer 2014). The R program was used to calculate the home range areas (95 % KDE = the area that the fish was located 95 % of the time) and the core area (50 % KDE, the area that the fish was located 50 % of the time). Monthly effects on core areas and home range areas were compared with one-way mixed-model repeated-measures analyses of variance (rmANOVA) with SAS (Statistical Analysis System, Cary, NC). In this model, tagged fish were considered a random factor and month was the repeated measure (Littell et al. 1998). Monthly home range areas were also tested for relationships with mean monthly temperatures with Pearson product-moment correlation (Zar 2010). Diel patterns in core areas and home range areas were compared by calculating area use for hourly periods within each month for each fish and analyzed with rmANOVA with tagged fish as the random factor and hour as the repeated measure. When significant differences ($\alpha < 0.05$) were detected, a Tukey-Kramer test was used to identify specific differences. A linear regression model was used to compare fish size and fish area use (Zar 2010). The mean distances that fish maintained from the artificial reef were calculated with the haversine formula (Piraino & Szedlmayer 2014). Time of sunrise and sunset were determined from the US Naval Observatory web site at the present study location (http://aa.usno.navy.mil/data/docs/RS_OneYear.php).

Results

Fish Tagging on VPS Sites

A total of 17 adult gray triggerfish were tagged and released on different dates from 17 Oct 2012 to 13 Oct 2013. Tagged fish were monitored on the two VPS sites from 17 Oct 2012 to 9 Dec 2013 (Table 1). Among the released gray triggerfish, four (23.5 %) were lost within 24 h (tagging effects) and 13 (76.4 %) were successfully tracked on the VPS sites for 8 to 399 days (Table 1; Fig.2). Among tracked fish, three were caught by fishers 21 to 156 days after release, one died 22 days after release, three emigrated 8 to 175 days after release and six fish were still present and being tracked at the end of this study (9 Dec 2013) 116 to 399 days after release (Table 1). Detection of control transmitters at each VPS site verified continuous detections over the entire study period.

Gray triggerfish stayed close to the reef (mean ± SD distance = 35.9 ± 28.4 m, n = 13 tagged gray triggerfish) and had high annual site fidelity (64 %) and high residency (> 57 weeks; Fig. 3). Among the fish that emigrated from the VPS detection area, one fish had multiple returns to its release site. Fish T4 emigrated from the VPS site (R4) on 4 March 2013 and returned on 15 March 2013, emigrated again on 17 March 2013 and returned on 26 March 2013, then emigrated again on 6 May 2013 and did not return. After emigrating from R4, fish T4 was detected on seven different surrounding reef sites (R1, R2, S3, S12, S13, S14, S45) with distances from its release site ranging from 1.7 to 7 km (Fig. 1). This fish stayed on R4 most of the time (total = 162 days, 84%), but was detected for short periods on these surrounding sites (1 – 6 days, total days = 20 days, 10 %) and its position was unknown for 10 days (5 %). Although these movement patterns of fish T4 might suggest a predation event, it was still considered a tagged gray triggerfish because after short visits to other reef sites it was again detected for 41 days on its release site and while resident on R4 its movement patterns matched other gray triggerfish patterns.

One presumed predation event occurred. The area use pattern of T13 became erratic and quite different from other gray triggerfish in May. The average home range of T13 was 700 m^2 for 9 days (2 – 12 May 2013), increased to 5121 m^2 on 13 May 2013 and 4537 m^2 on 14 May 2013, and then was 244 m^2 over the next 5 days. The transmitter of T13 was recovered laying on the sea floor 20 m north of the reef on 21 May 2013. These single-day larger areas were most likely too great for a tagged gray triggerfish as all other tagged gray triggerfish showed smaller daily home ranges (range 78-2535 m^2) during May 2013 (Fig. 4).

Seasonal patterns

Gray triggerfish home range areas (95 % KDE) were significantly greater in September compared to winter and spring months (January through May; $F_{11, 51} = 2.9$, $P = 0.006$; Fig. 4). Home range areas were positively correlated with water temperature ($r = 0.80$, $P = 0.002$; Fig. 4). Core areas showed the same patterns as home range areas by month ($F_{11, 51} = 2.7$, $P = 0.008$) and correlation with temperature ($r = 0.95$, $P < 0.001$; Fig. 4). Significant relations were not detected between fish length and home range areas ($R^2 = 0.05$, $P = 0.46$).

Home range areas from 0600 to 1700 hours were significantly greater than from 1800 to 2400 and 0000 to 0500 hours ($F_{23, 850} = 19.0$, $P < 0.001$). Home range also showed a pattern of increasing from 0500 to 0700 hours and decreasing from 1700 to 1800 hours (Fig. 5). Temporal patterns of core areas were the same as home range ($F_{23, 850} = 23.9$, $P < 0.001$; Fig. 5).

The time of day when home range area changed varied among seasons and coincided with the changing times of sunrise and sunset. For all four seasonal comparisons the increase in areas occurred at sunrise, while the decrease in areas occurred at sunset (Fig. 6). These patterns were consistent for each season and matched patterns pooled over all seasons (Fig. 5).

Discussion

Tagging Effects

One objective of this study was to estimate the effect of an implanted transmitter on gray triggerfish and determine if telemetry would provide meaningful and reliable information for this species. Although this technique has been successfully used for other species such as red snapper (Piraino & Szedlmayer 2014), these previous methods of tag implantation were questionable with gray triggerfish because this species has a smaller peritoneal cavity and a tough skin that makes surgery difficult. In addition, aggressive behaviors have been documented especially by male gray triggerfish, and tagged fish may be subject to increased attacks by untagged gray triggerfish during recovery (Simmons & Szedlmayer 2012). In the present study, the field releases clearly showed that gray triggerfish could be tagged, would survive and provided long-term fine-scale tracking data. In support, SCUBA divers periodically observed tagged gray triggerfish on the reef sites and reported that the fish appeared healthy with no signs of infection or torn fins, were swimming up in the water column with other untagged gray triggerfish and were not hiding in the reef. Also supporting the present tagging methods were recaptures of tagged gray triggerfish during subsequent tagging trips, with all fish appearing in excellent condition. These visual observations and recaptures confirmed that tagged fish were feeding and competitive with non-tagged fish and that telemetry studies with gray triggerfish can be successful.

The emigration rate due to tagging effects (17.6 %) in this study was similar to that reported in red snapper telemetry studies at 17 % (Topping & Szedlmayer 2013) and 14.8 % (Szedlmayer & Schroepfer 2005). More recently, Piraino and Szedlmayer (2014) reported a high tagging-effect loss (45.5 %), but they developed a cage release method that significantly increased the survival to 92 % for transmitter-tagged red snapper. In the present study, similar cage release methods were applied that would account for the lower tag-effect loss rate than might be expected without predator protection cages (Piraino & Szedlmayer 2014; Williams et al. 2015).

One tagged gray triggerfish (fish T13) died 22 days after tagging and was attributed to a predation event. In support of possible predation events, SCUBA divers commonly observed sandbar shark, Carcharhinus plumbeus (Nardo), and bull shark, Carcharhinus leucas (Müller & Henle), around the VPS arrays, and direct observations of shark predation on the surface was common during fish tagging. For example, 28 % of tagged red snapper suffered mortality in 2010 and 2011, most likely from shark predation (Piraino & Szedlmayer 2014). Ingram (2001) and Ingram & Patterson (2001) estimated mortality due to external tagging for gray triggerfish was only 1.5 – 2.0 % (); but these estimates were based on the condition of tagged fish released at the surface, and it is likely that additional predation occurred after tagged fish left the surface (Piraino and Szedlmayer (2014).

Residency and Site Fidelity

In the present study, gray triggerfish had long-term residency (> 57 weeks), high site fidelity (64 %) and close association with reef structure (mean distance from reef = 35.9 m). Traditional tagging studies on gray triggerfish have also reported high site fidelity with 58.3 % (Ingram & Patterson 2001) and 67 % of tagged gray triggerfish recaptured at their release site (Addis et al. 2007). The time at liberty in previous mark-recapture studies for gray triggerfish (mean = 190 days, Ingram & Patterson 2001; mean = 161 days, Addis et al. 2007) was less than residency time of tagged gray triggerfish in the present study. However, these previous estimates were based on recaptures that harvest fish from reef sites and are known underestimates because residency times before tagging and after recapture cannot be estimated. In addition, these past studies could not define home ranges, fine scale habitat area use, or define movements between mark and recapture.

Tagged gray triggerfish showed homing behavior as one tagged gray triggerfish (fish T4) left and visited seven reef sites as far away as 7 km and returned to its original tagging site. Other reef fishes, such as red snapper, have also shown homing behavior with individuals emigrating as far as 8 km and returning after as long as 8 months (Topping & Szedlmayer 2011a; Piraino & Szedlmayer 2014). Another reef fish, gag, Mycteroperca microlepis (Goode and Bean), displaced from reefs in the northern Gulf of Mexico moved 3 km within 10 days back to their original site of capture (Kiel 2004).

Several fish (n = 3) emigrated from the VPS sites after staying from 8 to 175 days at their release sites. Spawning may have been a factor. All gray triggerfish that emigrated were tagged before the spawning season (May - August), and two (fish T4 and T9) left the VPS site during the spawning season. Fish T9 was the smallest fish tagged in the present study, and its small size may have played a role in leaving due to interactions with larger dominant males (Simmons & Szedlmayer 2012).

Seasonal patterns

Home range and core areas of tagged gray triggerfish were reduced during the winter and spring (January through May). This might be expected for this subtropical species as deeper water had a delayed warming compared to surface waters. In turn, areas increased in June and July but were still about half of the maximum reached in September (Fig. 4). Possibly these patterns were a consequence of increased energetic demands associated with increasing temperature (Stehfest et al. 2015) but constrained by spawning activity that tended to keep gray triggerfish near the reef structure. For example, in the northern Gulf of Mexico, gray triggerfish spawn during the summer months with peak spawning occurring during June and July (Wilson et al. 1995; Ingram 2001; Simmons & Szedlmayer 2012). Typically there is one dominant male on an artificial reef that excludes subordinate males from the reef, especially during the spawning season (Simmons & Szedlmayer 2012). Usually these spawning groups are established by June and would tend to cause reduced movements despite increasing temperatures (Simmons & Szedlmayer 2012). Similar aggressive behaviors that would tend to reduce movements have been observed in other Balistidae. For example, male redtail triggerfish, Xanthichthys mento (Jordan and Gilbert), chase off other males only during the spawning season (Kawase 2003), female blue triggerfish, Pseudobalistes fuscus (Bloch & Schneider), are aggressive towards any other triggerfish that come too close during spawning season (Fricke 1980) and female-female aggressive encounters are common during breeding season for red-toothed triggerfish, Odonus niger (Rüppell) (Fricke, 1980). Although rare, female gray triggerfish have also been observed chasing off other females interested in the same nest (Simmons & Szedlmayer 2012). Thus, with the end of spawning (after July) and reduction in aggression, gray triggerfish could expand their core and home range areas (August and September).

Tagged gray triggerfish showed clear diel movement patterns. Home range and core areas were significantly larger during the day than night. It was clear that these diel differences were tied to sunrise and sunset as patterns shifted with seasonal changes in daylight hours. Other Balistidae showed similar diel patterns. For example, the fine scale triggerfish, Balistes polylepis Steindachner, the orangeside triggerfish, Sufflamen verres (Gilbert and Starks), and the black triggerfish, Melichthys niger (Bloch), rest in small holes during the nocturnal hours (Hobson 1965; Kavanagh & Olney 2006). Gray triggerfish may be showing a similar behavior and rest in the reef at night. Diel patterns are also most likely related to foraging as gray triggerfish have shown foraging away from the reef only during the daytime (Frazer & Lindberg 1994; Vose & Nelson 1994).

Predation may also play an important role in the observed diel patterns in gray triggerfish, as indicated by common sightings by SCUBA divers (9 out of 20 dives in 2 days in the present study) of bull shark and sandbar shark on the VPS sites. Both the bull shark and the sandbar shark increase their feeding activity at night (Driggers et al. 2012). Reduced movement and possibly seeking shelter in the reef at night would reduce vulnerability to predation (Werner et al. 1983; Piraino & Szedlmayer 2014).

Conclusions

This is the first reported telemetry study on gray triggerfish around artificial reefs in the northern Gulf of Mexico. The present study showed a high success rate (76 %) of implanting transmitters and tracking gray triggerfish and demonstrated that acoustic telemetry can provide a major advance in the ability to estimate gray triggerfish habitat use. Tagged gray triggerfish had high annual site fidelity (64 %) and high residency (> 57 weeks) on the same reef with little time in open habitat while on the VPS site. Fine scale movements of gray triggerfish showed diel patterns, with significantly greater home range and core areas during the day as compared to night periods. These diel patterns are likely linked to foraging behaviors and reducing the risk of nocturnal predation. Gray triggerfish core and home range areas also had seasonal patterns with areas being larger during the late summer and autumn compared to winter and spring. These seasonal differences in core and home range areas were positively correlated with water temperature but may also result from increased intraspecific territoriality during the summer months. In general, this study found that gray triggerfish were highly associated with artificial reefs in the northern Gulf of Mexico.

The use of artificial habitat in the northern Gulf of Mexico to manage important fish species is a contentious topic (Cowan et al. 2009; Gallaway et al. 2009). The addition of structured habitat in the form of artificial reefs may boost production by increasing shelter and prey (Brickhill et al. 2005; Gallaway et al. 2009; Shipp & Bortone 2009). However, artificial reefs may simply attract fish and the higher catch rates may be driving fish stocks towards faster depletion (Brickhill et al. 2005; Cowan et al. 2009). The high site fidelity of gray triggerfish to the artificial reefs used for this study coupled with little time spent over open habitat while in the VPS array and homing behavior supports the importance of artificial reefs for gray triggerfish in the northern Gulf of Mexico. As such, future attempts to increase this stock should consider habitat enhancement as an additional tool for management of this important species.

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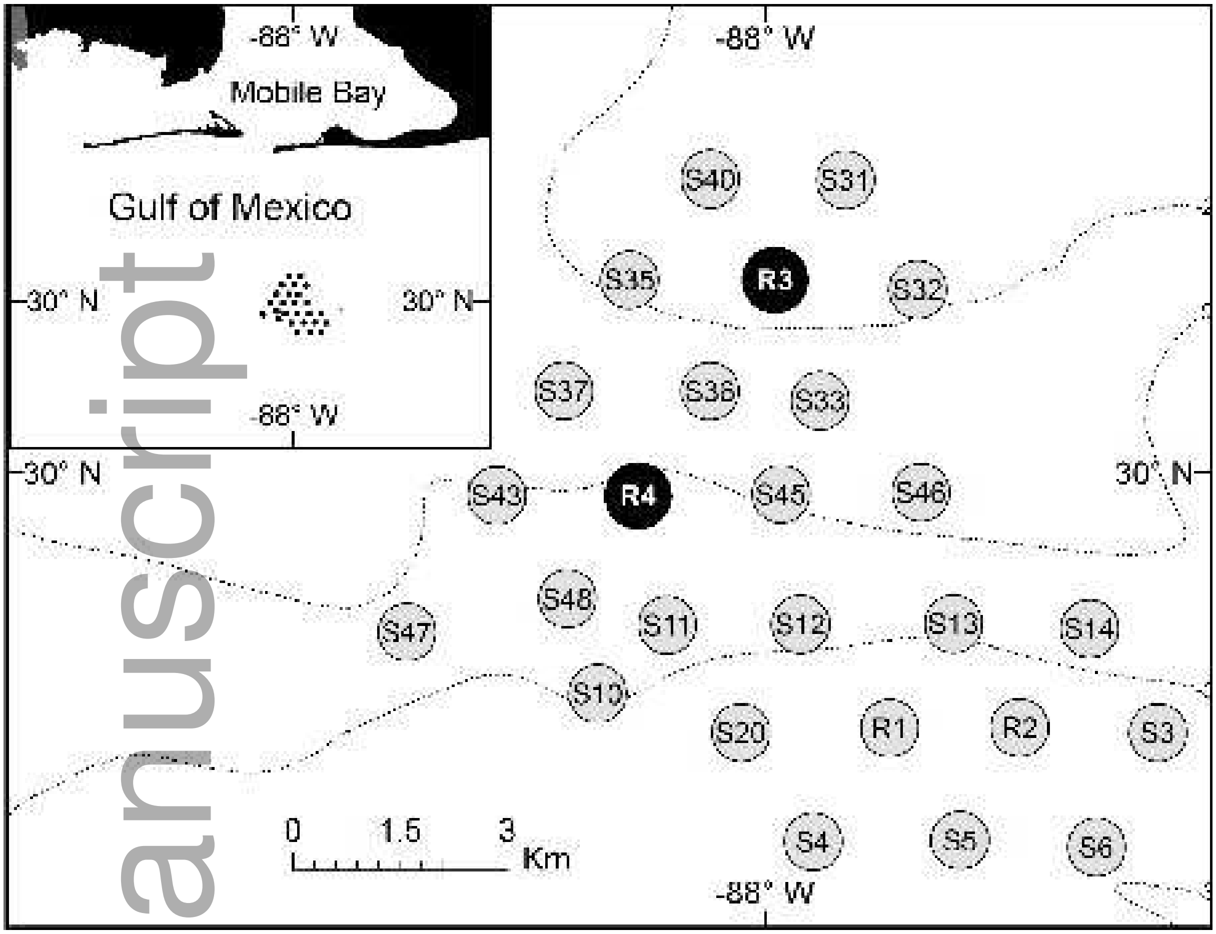
Table 1. Summary data for transmitter tagged gray triggerfish, Balistes capriscus Gmelin, on artificial reef sites in the northern Gulf of Mexico. Event date is the day of emigration, mortality or loss of a tagged fish. Sites outside the VPS array contain single receivers and are reef sites outside the area of fine scale position detection. Secondary sites are additional reef sites within the position detection area of the VPS array.

Date tagged	Tagging site	Fish	Weight (kg)	SL (mm)	Days tracked	Event date	Status	Sites outside VPS array where detected	Secondary sites within the VPS array
17 Oct 12	R4	T1	1.4	318	8	25 Oct 12	Emigration	1	No
2 Nov 12	R4	T3	1.0	279	0	2 Nov 12	Lost		
5 Nov 12	R4	T4	1.4	329	119	4 Mar 13	Emigration	7	Yes
5 Nov 12	R4	T5	1.0	294	399	9 Dec 13	Active	1	Yes
20 Nov 12	R3	T6	0.9	272	384	9 Dec 13	Active	1	Yes
20 Nov 12	R3	T7	1.0	291	159	28 Apr 13	Caught	1	Yes
20 Nov 12	R3	T8	0.7	279	116	16 Mar 13	Caught	1	Yes
23 Jan 13	R4	T9	0.5	250	175	17 Jul 13	Emigration	1	Yes
23 Jan 13	R4	T10	0.7	274	1	24 Jan 13	Lost	2	
23 Jan 13	R4	T11	0.4	232	0	23 Jan 13	Stationary	1	No
29 Apr 13	R4	T12	0.8	289	224	9 Dec 13	Active	1	Yes
29 Apr 13	R4	T13	2.5	382	22	21 May 13	Predation	1	No
8 Jul 13	R3	T15	1.0	284	154	9 Dec 13	Active	1	Yes
8 Jul 13	R3	T16	0.7	257	154	9 Dec 13	Active	1	Yes
15 Aug 13	R3	T17	0.5	266	116	9 Dec 13	Active	1	Yes
15 Aug 13	R3	T18	0.6	284	0	15 Aug 13	Lost		
17 Oct 13	R4	T19	0.6	251	21	7 Nov 13	Caught	1	Yes



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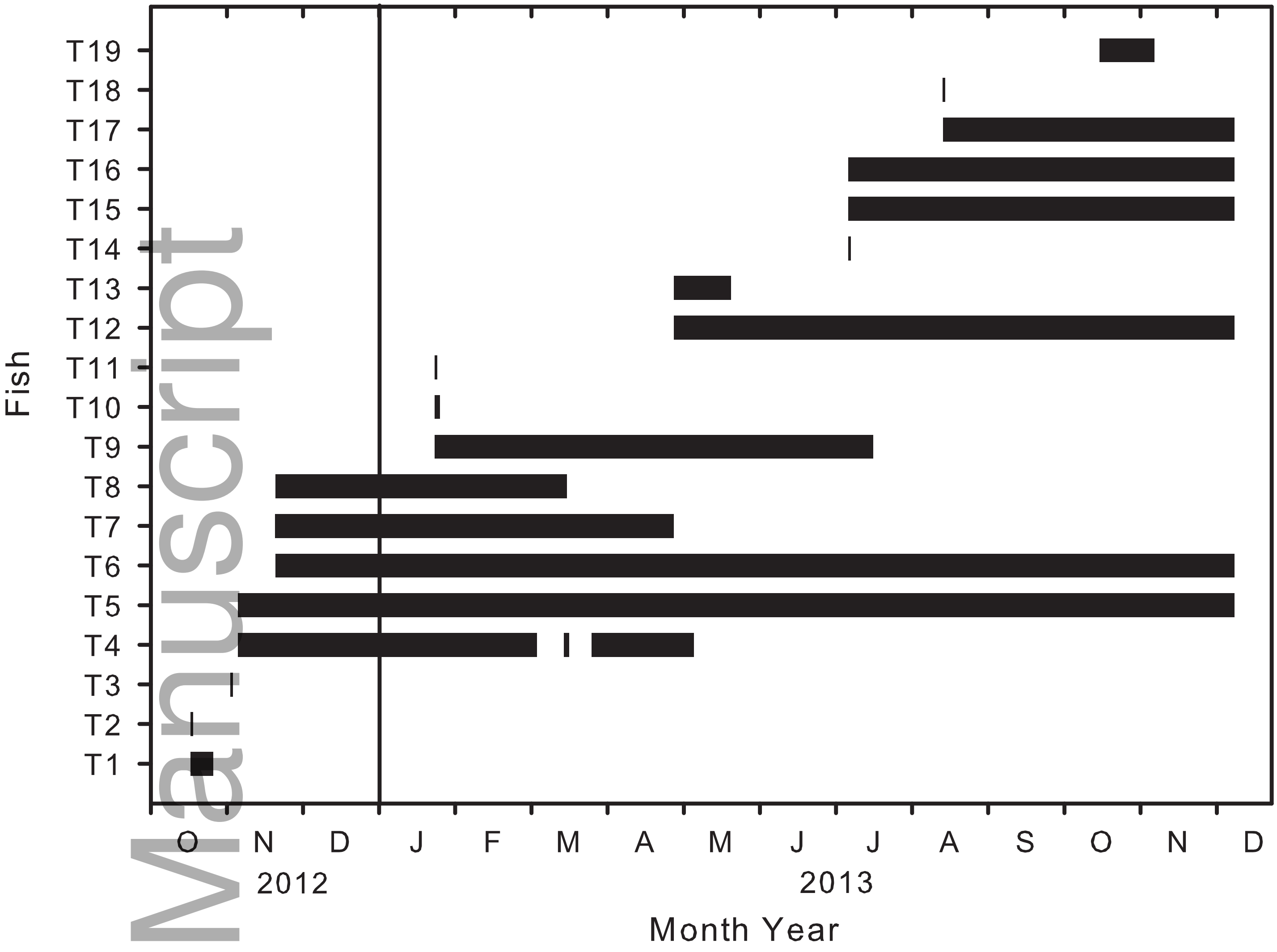

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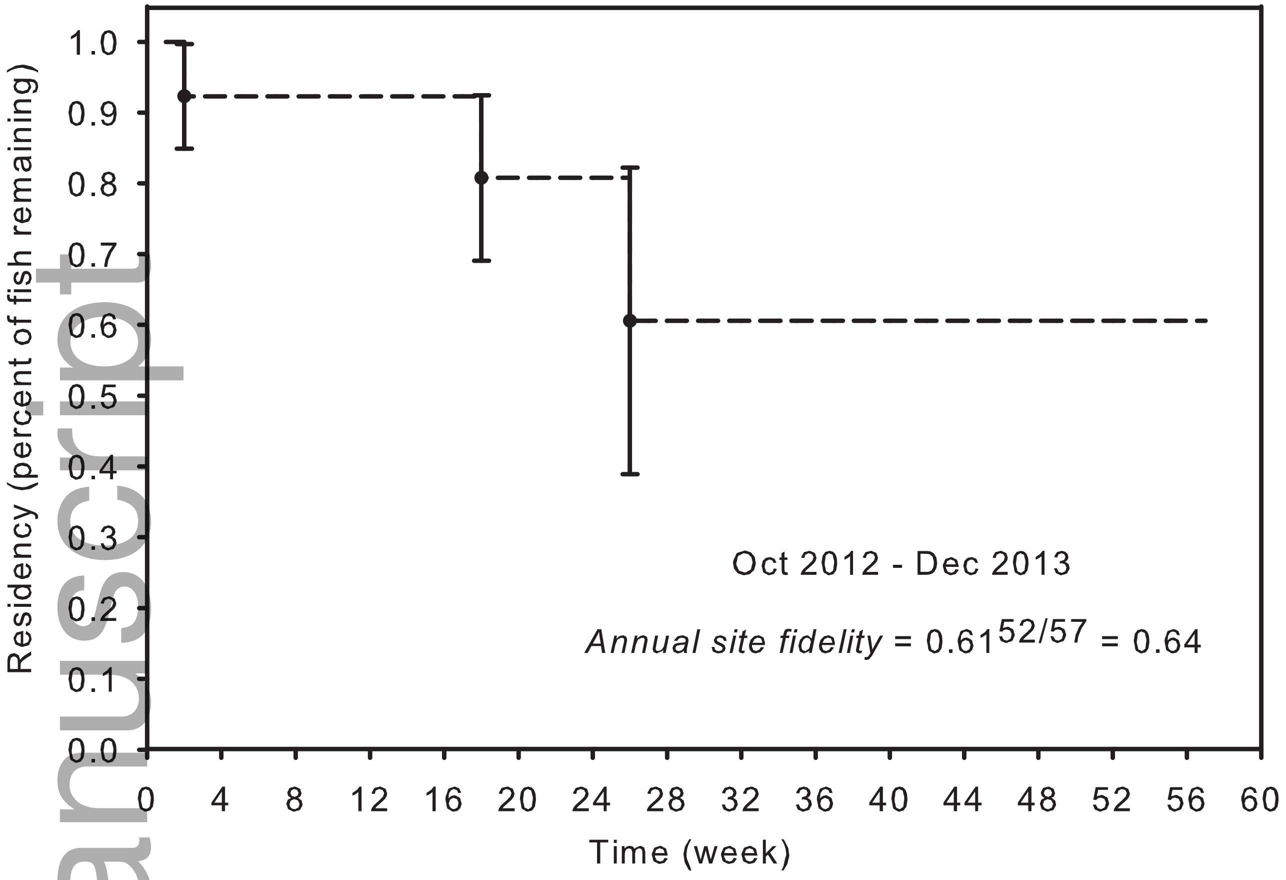

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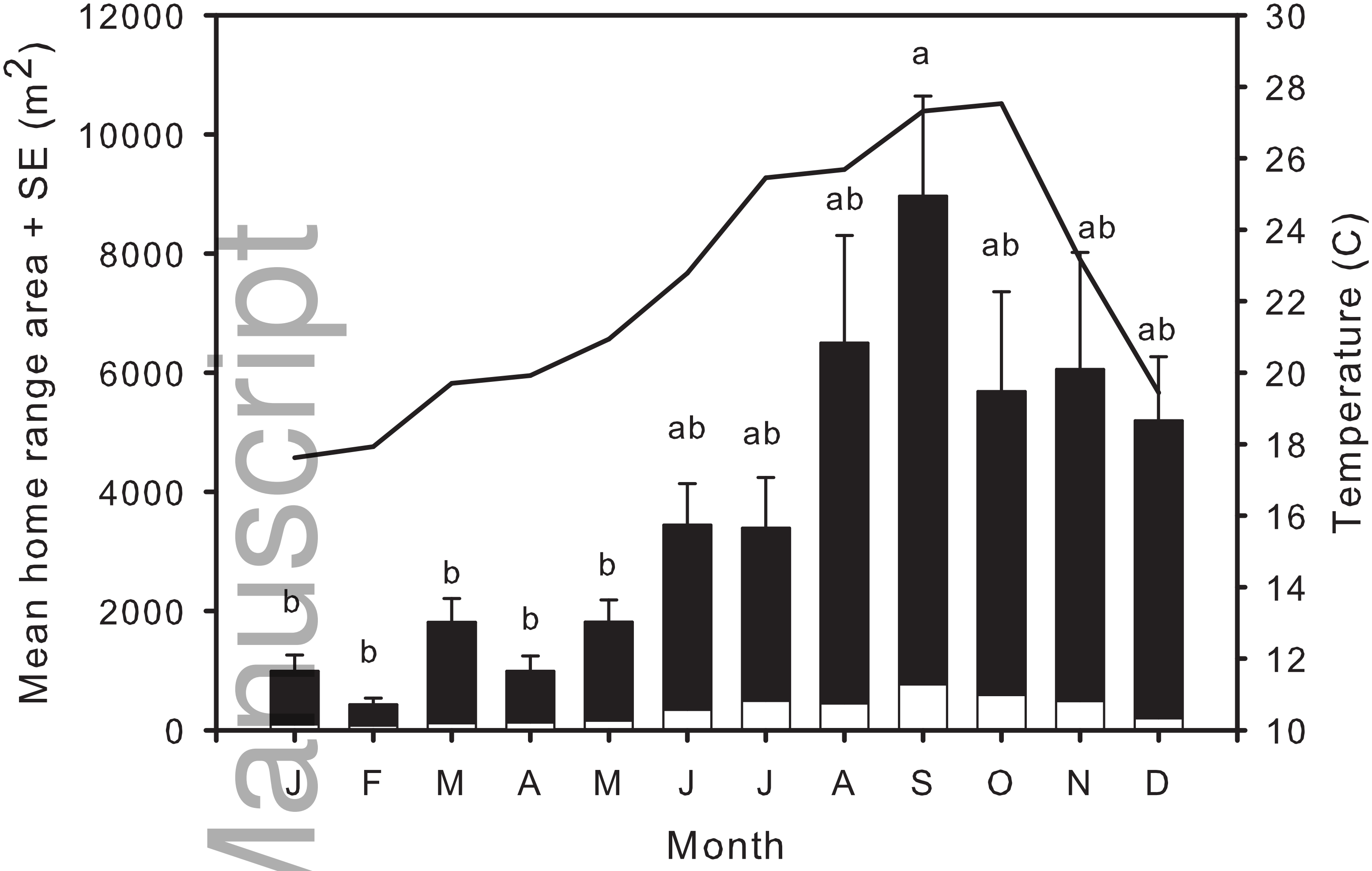

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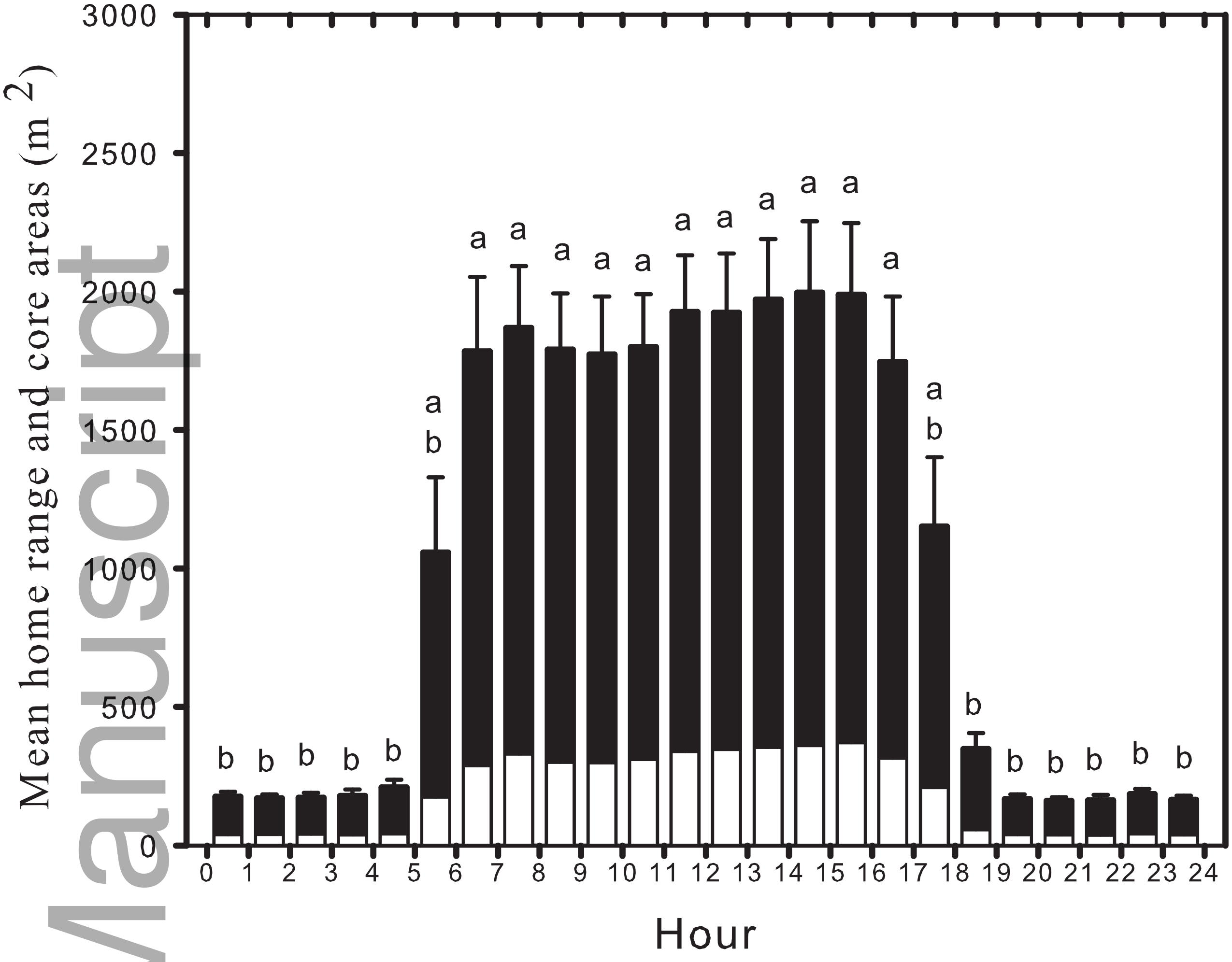

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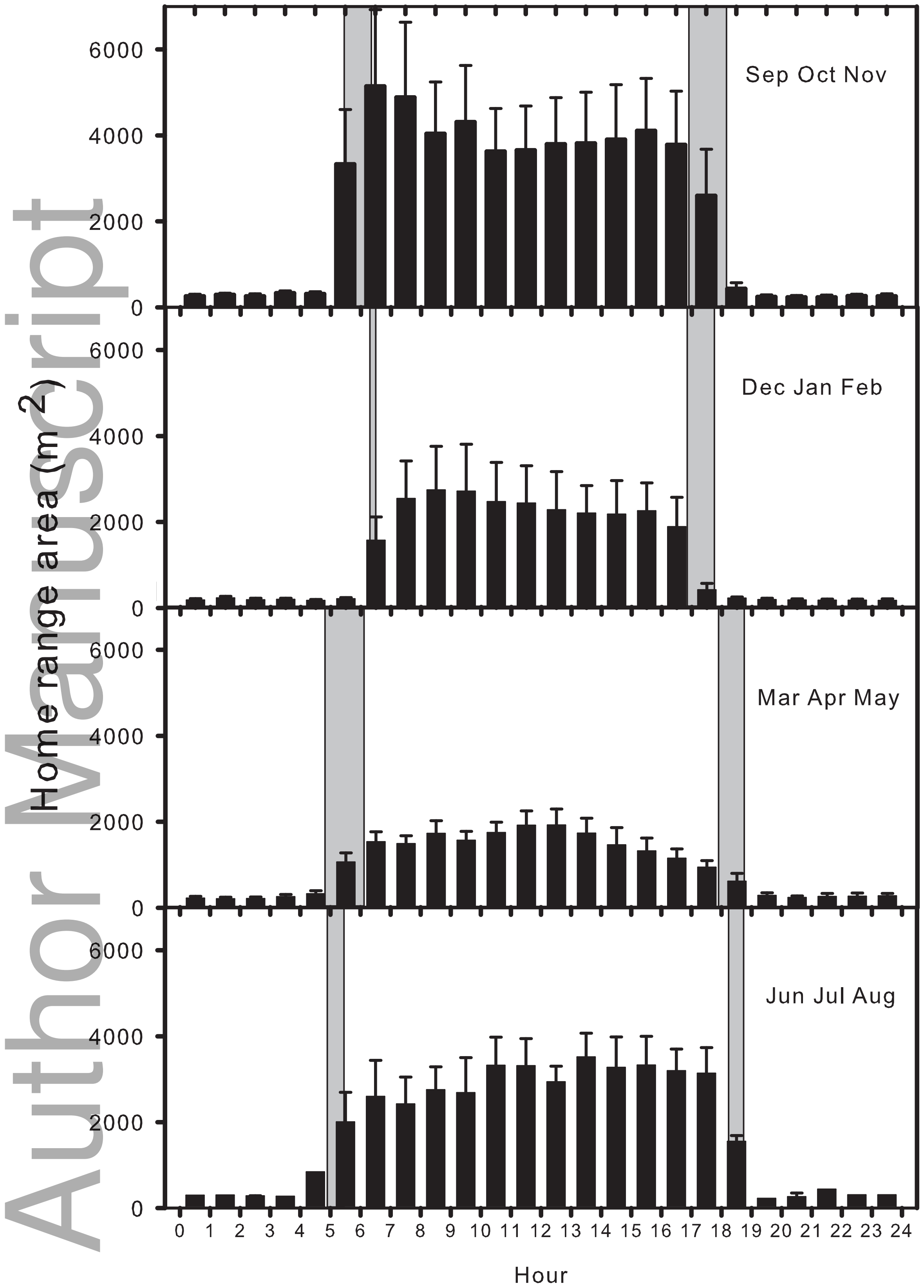

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