Supplemental Figures and Tables

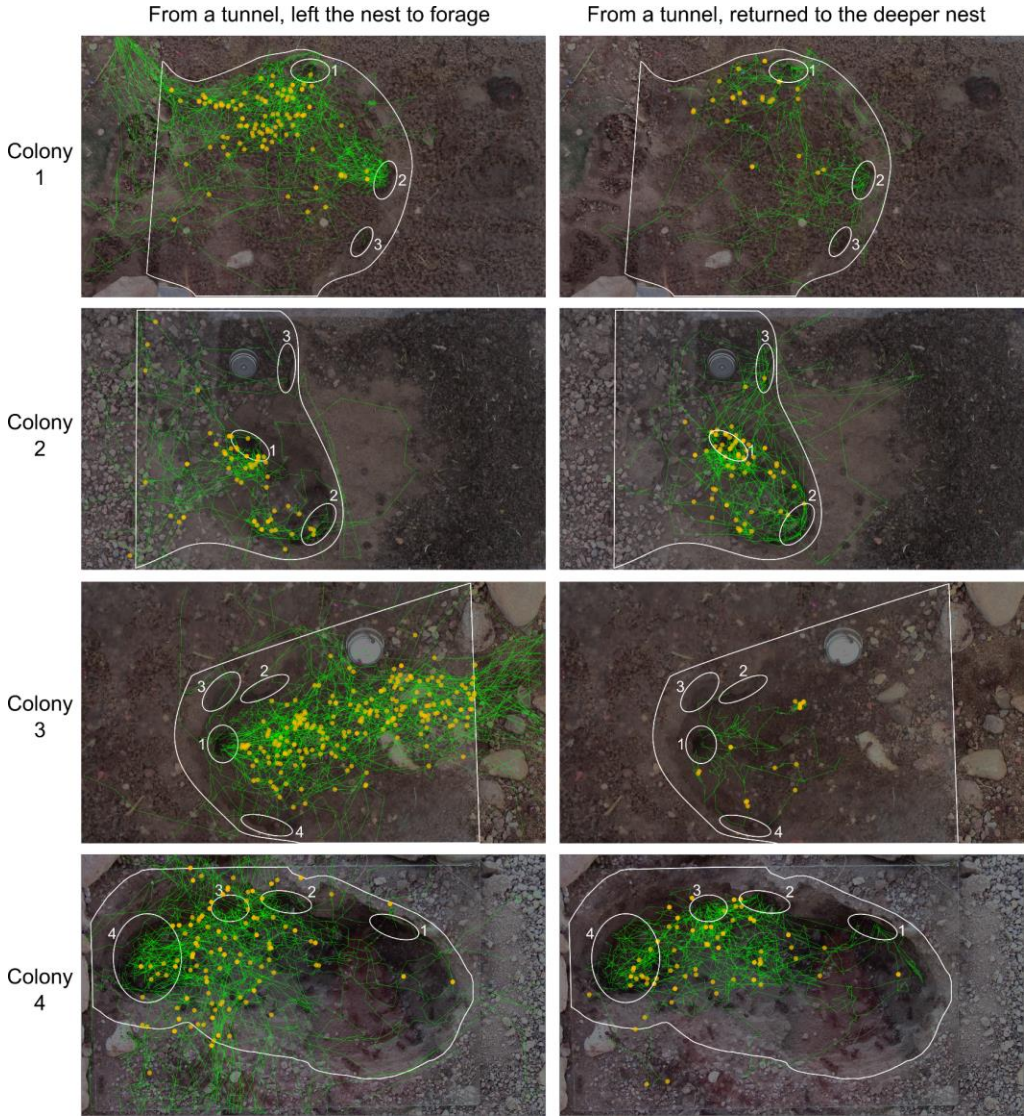

Figure S1. The trajectories and locations of interactions of potential forager ants with returning foragers. Trajectories are shown as green lines, and locations of interactions with returning foragers are shown as yellow dots. Ants that emerged from a tunnel and left the nest to forage are shown in the left column, and ants that emerged from a tunnel and returned to the deeper nest are shown in the right column. The numerical labels 1, 2, 3, and 4 identify the observed colony, and colony data are organized by row. White lines show the entrance chamber boundary and the locations of tunnels; numbers label each tunnel.

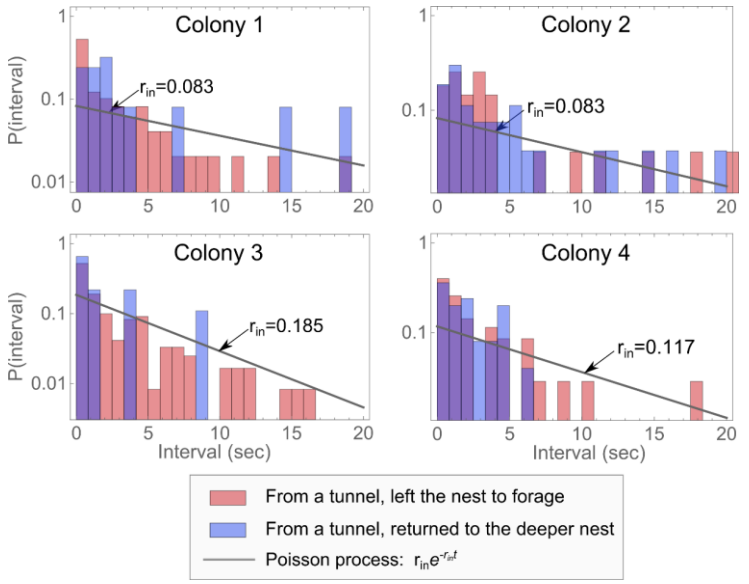

Figure S2. The distribution of intervals between interactions that potential forager ants made with returning foragers. Data are shown for potential foragers that emerged from a tunnel and either left the nest to forage (red) or returned to the deeper nest (blue), in comparison to a Poisson process (gray lines). The labels 1, 2, 3, and 4 identify the observed colony. The value of r_{in} is the overall average rate of interaction for the observation from a colony, i.e. $r_{in} = \sum N / \sum T$, where the sum is over all potential foragers from a tunnel.

Trajectory information		Colony label			
Start of trajectory	Action	1	2	3	4
From a tunnel	Left the nest to forage	47	28	70	115
	Returned to the deeper nest	22	36	9	69
	Carrying food or unknown object	28	1	17	12
	Always in tunnel	4	11	0	13
	Returned to the deeper nest, in shorter time than fastest outgoing forager	4	0	2	0
	Lost during tracking	8	8	5	19
	Uncertain trajectory (colony 1)	28	0	0	0
	Total from tunnel	**141**	**84**	**103**	**228**
From outside	Left the nest to forage	9	16	68	37
	Returned to the deeper nest	51	39	21	126
	Lost or uncertain trajectory	10	13	5	16
	Total from outside	**70**	**70**	**68**	**94**
	Few tracking points	8	49	6	3
	Other	16	31	33	88
	Total other forager ants	**24**	**80**	**39**	**91**
	Total forager ants	**235**	**232**	**236**	**498**
	Nest maintenance workers	14	2	1	44
	Total ants	**249**	**234**	**237**	**542**

Table S1. A complete categorization of ant trajectories with total number of ants in each category. This table includes the total number of tracked ants in each listed category that completed trajectories within the focus tracking period during which all interactions were marked. Ants labeled "From a tunnel" began their trajectory by emerging from one of the tunnels into the entrance chamber. Ants labeled "From outside" began their trajectory by entering the video frame from a direction of active colony foraging; these ants were considered to be returning foragers. Ants that "left the nest to forage" left the video frame in a direction of active colony foraging, and ants that "returned to the deeper nest" ended their trajectory by going down a tunnel. Ants were not considered to be potential foragers if they emerged from a tunnel carrying an object and thus were likely to have been engaged in in nest maintenance work ("Carrying food or unknown object"), never left a tunnel area ("Always in tunnel"), or returned to the deeper nest but stayed in the entrance chamber for a time less than that of the fastest outgoing forager ("Returned to the deeper nest, in shorter time than fastest outgoing forager"). Sometimes we could not discern the path of an ant because it got lost among other ants in the video; these trajectories were labeled as "lost during tracking". If an ant carried dirt or debris out of the nest, it was considered to be a nest maintenance worker. For colony 1, if an ant first appeared in the upper right area of the video frame, it was also considered to be a nest maintenance worker since the colony was engaged in maintenance work in this area.

For colony 1, ants that emerged from a tunnel that were not seen to be carrying dirt, but ended their trajectory near the upper right area of the video frame (which was an area of active nest maintenance) were labeled as uncertain ("Uncertain trajectory (colony 1)"). Ants with "few tracking points" either only appeared in the video frame for a very short time, often at the edge of the frame or never leaving a tunnel area, or were lost and could not be followed any further. Ants

labeled as "other" do not fall into any of the other categories, and mainly include ants that could not be followed back in time to discern where they started from. For colony 4, due to activity near the entrance chamber, the "other" category also includes ants that entered the video frame but left without ever coming into the entrance chamber area.

	Colony label			
	1	2	3	4
Colony ID on field site	242	25	868	F
Date of filming	8/26/2013	8/24/2013	8/21/2013	8/30/2014
Time of day (a.m.)	8:25	9:00	8:50	9:15
Focus tracking period length	180 s	180 s	75 s	60 s

Table S2. Video information for each colony observation.

	Log-likelihood for each set of logistic regression model inputs			
Colony label	*Const.*	*r*	*N, r*	*T, r*
1	-43.19	-40.75	-40.49	-40.74
2	-43.86	-41.31	-40.71	-38.65
3	-28.02	-26.16	-25.65	-26.16
4	-121.73	-119.07	-115.58	-117.19

Table S3. Log-likelihood values from fits using different combinations of inputs to the logistic regression model. See the main text for formal model comparison.