Questions:

1. B&R: Do groups with higher payoff equilibria evolve marked boundaries more than those with low payoff equilibria?
   1. When there are bigger payoff diffs between groups, groups at the boundary have higher co-var between bhvr & marker than those away from boundary.
   2. The groups with higher payoff equilibria (stag hunters) have higher linkage between bhvr & marker than the groups with lower payoff (hare hunters).

1. 90% of migrants are payoff biased:

feet\_marker\_sim(

tmax=100,

d=0.5, #coordination benefit

g=2, #extra coordination benefit among mutualists

h=0, #mis-coordination cost for mutualists

a=0, #probability of assorting on marker

m0=0.03, #base proportion of each group that migrates

mu=0.9, #mean-payoff bias in migration decisions

s=rep(.1,10), #proportion of total population in each group

init\_p=c(rep(.9,4),rep(.1,6)), #intial proportion of behavior 0 in each group

init\_q=c(rep(.6,4),rep(.4,6)), #intial proportion of marker 0 in each group

draw=TRUE )

2. Turn off payoff biased migration:

feet\_marker\_sim(

tmax=100,

d=0.5, #coordination benefit

g=2, #extra coordination benefit among mutualists

h=0, #mis-coordination cost for mutualists

a=0, #probability of assorting on marker

m0=0.03, #proportion of each group that migrates

mu=0, #of all migrants, proportion that engage in payoff biased migration

s=rep(.1,10), #proportion of total population in each group

init\_p=c(rep(.9,4),rep(.1,6)), #intial proportion of behavior 0 in each group

init\_q=c(rep(.6,4),rep(.4,6)), #intial proportion of marker 0 in each group

draw=TRUE )

|  |  |
| --- | --- |
| 1. mu=.9 | 2. mu=0 |
|  |  |

1a). Killing off stags (like #12 in original comments)

2-group scenario:

feet\_marker\_sim(

tmax=200,

d=0.5, #coordination benefit

g=.5, #extra coordination benefit among mutualists

h=.5, #mis-coordination cost for mutualists

a=.5, #probability of assorting on marker

m0=0.1, #proportion of each group that migrates

mu=0.5, #of all migrants, proportion that engage in payoff biased migration

s=c(0.2, 0.8), #proportion of total population in each group

init\_p=c(0.9,0.1), #intial proportion of behavior 0 (stag) in each group

init\_q=c(0.9,0.1), #intial proportion of marker 0 in each group

draw=TRUE )



at time=1

1b) Boundary killing stags, vs killing hares

n-group scenario

**Minority stags being dragged down to hare**

feet\_marker\_sim(

tmax=100,

d=0.5, #coordination benefit

g=.29, #extra coordination benefit among mutualists

h=0.5, #mis-coordination cost for mutualists

a=0, #probability of assorting on marker

m0=0.1, #proportion of each group that migrates

mu=0.1, #of all migrants, proportion that engage in payoff biased migration

s=rep(.1,10), #proportion of total population in each group

init\_p=c(rep(.6,3),rep(.4,7)), #intial proportion of behavior 0 in each group

init\_q=c(rep(.6,3),rep(.4,7)), #intial proportion of marker 0 in each group

draw=TRUE )



**Rescuing stags (by increasing payoff biased migration)**

feet\_marker\_sim(

tmax=100,

d=0.5, #coordination benefit

g=.29, #extra coordination benefit among mutualists

h=0.5, #mis-coordination cost for mutualists

a=0, #probability of assorting on marker

m0=0.1, #proportion of each group that migrates

mu=0.9, #of all migrants, proportion that engage in payoff biased migration

s=rep(.1,10), #proportion of total population in each group

init\_p=c(rep(.6,3),rep(.4,7)), #intial proportion of behavior 0 in each group

init\_q=c(rep(.6,3),rep(.4,7)), #intial proportion of marker 0 in each group

draw=TRUE )



**Rescuing stags (by increasing assortment)**

feet\_marker\_sim(

tmax=100,

d=0.5, #coordination benefit

g=.29, #extra coordination benefit among mutualists

h=0.5, #mis-coordination cost for mutualists

a=0.5, #probability of assorting on marker

m0=0.1, #proportion of each group that migrates

mu=0.1, #of all migrants, proportion that engage in payoff biased migration

s=rep(.1,10), #proportion of total population in each group

init\_p=c(rep(.6,3),rep(.4,7)), #intial proportion of behavior 0 in each group

init\_q=c(rep(.6,3),rep(.4,7)), #intial proportion of marker 0 in each group

draw=TRUE )



**Killing hares (by increasing assortment)**

feet\_marker\_sim(

tmax=100,

d=0.5, #coordination benefit

g=.29, #extra coordination benefit among mutualists

h=0.5, #mis-coordination cost for mutualists

a=0.9, #probability of assorting on marker

m0=0.1, #proportion of each group that migrates

mu=0.1, #of all migrants, proportion that engage in payoff biased migration

s=rep(.1,10), #proportion of total population in each group

init\_p=c(rep(.6,3),rep(.4,7)), #intial proportion of behavior 0 in each group

init\_q=c(rep(.6,3),rep(.4,7)), #intial proportion of marker 0 in each group

draw=TRUE )

