model

{

#prior probabilities of birds with each band type moving to one of the 7 regions. Each calculated prob. is #a Dirichlet prior

for(i in 1:7){

 mband1[i]~dgamma(1,1)

 moveband1[i]<-mband1[i]/(sum(mband1[]))

 }

for(i in 1:7){

 mband2[i]~dgamma(1,1)

 moveband2[i]<-mband2[i]/(sum(mband2[]))

 }

for(i in 1:7){

 mband3[i]~dgamma(1,1)

 moveband3[i]<-mband3[i]/(sum(mband3[]))

 }

for(i in 1:7){

 mband4[i]~dgamma(1,1)

 moveband4[i]<-mband4[i]/(sum(mband4[]))

 }

 DP1~dbeta(99,1) #Detection probability for different bands modeled as beta dist

 DP2~dbeta(16.5,34) # Means- DP1=1, DP2=0.32, DP3=0.5, DP4= 0.71

 DP3~dbeta(20,20)

 DP4~dbeta(35.5,15)

HR~dbeta(2,19) # Harvest Rates used by Conroy et al 2002

#Below is the model describing the data

# move\_rec\_B1\_B2 = prob of a bird with band type 1 moving to B1

#moveband1 = prob of a bird with band type 1 moving from a given region (B1, B2, B3, W1 etc.; from #prior calculation above)

# DP1 = detection probability of band 1

# HR = harvest rate (from constant above)

 move\_rec\_B1\_B1<-moveband1[1]\*DP1\*HR # data = prob moved\*detection probabilities \*harvest (with different bands)

 move\_rec\_B2\_B1<-moveband2[1]\*DP2\*HR

 move\_rec\_B3\_B1<-moveband3[1]\*DP3\*HR

 move\_rec\_B4\_B1<-moveband4[1]\*DP4\*HR

 move\_rec\_B1\_B2<-moveband1[2] \*DP1\*HR

 move\_rec\_B2\_B2<-moveband2[2]\*DP2\*HR

 move\_rec\_B3\_B2<-moveband3[2]\*DP3\*HR

 move\_rec\_B4\_B2<-moveband4[2]\*DP4\*HR

 move\_rec\_B1\_B3<-moveband1[3]\*DP1\*HR

 move\_rec\_B2\_B3<-moveband2[3]\*DP2\*HR

 move\_rec\_B3\_B3<-moveband3[3]\*DP3\*HR

 move\_rec\_B4\_B3<-moveband4[3]\*DP4\*HR

 move\_rec\_B1\_B4<-moveband1[4]\*DP1\*HR

 move\_rec\_B2\_B4<-moveband2[4]\*DP2\*HR

 move\_rec\_B3\_B4<-moveband3[4]\*DP3\*HR

 move\_rec\_B4\_B4<-moveband4[4]\*DP4\*HR

 move\_rec\_B1\_W1<-moveband1[5]\*DP1\*HR

 move\_rec\_B2\_W1<-moveband2[5]\*DP2\*HR

 move\_rec\_B3\_W1<-moveband3[5]\*DP3\*HR

 move\_rec\_B4\_W1<-moveband4[5]\*DP4\*HR

 move\_rec\_B1\_W2<-moveband1[6]\*DP1\*HR

 move\_rec\_B2\_W2<-moveband2[6]\*DP2\*HR

 move\_rec\_B3\_W2<-moveband3[6]\*DP3\*HR

 move\_rec\_B4\_W2<-moveband4[6]\*DP4\*HR

 move\_rec\_B1\_W3<-moveband1[7]\*DP1\*HR

 move\_rec\_B2\_W3<-moveband2[7]\*DP2\*HR

 move\_rec\_B3\_W3<-moveband3[7]\*DP3\*HR

 move\_rec\_B4\_W3<-moveband4[7]\*DP4\*HR

 N\_B1~dpois(est\_B1) #Estimated number of birds that could have moved for each band type

 N\_B2~dpois(est\_B2)

 N\_B3~dpois(est\_B3)

 N\_B4~dpois(est\_B4)

 NE<-N\_B1+N\_B2+N\_B3+N\_B4 #Estimated total number of birds that could have moved

 Det\_B1\_B1~dbin(move\_rec\_B1\_B1,N\_B1) #Fitting the data to the model

 Det\_B1\_B2~dbin(move\_rec\_B2\_B1,N\_B2)

 Det\_B1\_B3~dbin(move\_rec\_B3\_B1,N\_B3)

 Det\_B1\_B4~dbin(move\_rec\_B4\_B1,N\_B4)

 Det\_B2\_B1~dbin(move\_rec\_B1\_B2,N\_B1)

 Det\_B2\_B2~dbin(move\_rec\_B2\_B2,N\_B2)

 Det\_B2\_B3~dbin(move\_rec\_B3\_B2,N\_B3)

 Det\_B2\_B4~dbin(move\_rec\_B4\_B2,N\_B4)

 Det\_B3\_B1~dbin(move\_rec\_B1\_B3,N\_B1)

 Det\_B3\_B2~dbin(move\_rec\_B2\_B3,N\_B2)

 Det\_B3\_B3~dbin(move\_rec\_B3\_B3,N\_B3)

 Det\_B3\_B4~dbin(move\_rec\_B4\_B3,N\_B4)

 Det\_B4\_B1~dbin(move\_rec\_B1\_B4,N\_B1)

 Det\_B4\_B2~dbin(move\_rec\_B2\_B4,N\_B2)

 Det\_B4\_B3~dbin(move\_rec\_B3\_B4,N\_B3)

 Det\_B4\_B4~dbin(move\_rec\_B4\_B4,N\_B4)

 Det\_W1\_B1~dbin(move\_rec\_B1\_W1,N\_B1)

 Det\_W1\_B2~dbin(move\_rec\_B2\_W1,N\_B2)

 Det\_W1\_B3~dbin(move\_rec\_B3\_W1,N\_B3)

 Det\_W1\_B4~dbin(move\_rec\_B4\_W1,N\_B4)

 Det\_W2\_B1~dbin(move\_rec\_B1\_W2,N\_B1)

 Det\_W2\_B2~dbin(move\_rec\_B2\_W2,N\_B2)

 Det\_W2\_B3~dbin(move\_rec\_B3\_W2,N\_B3)

 Det\_W2\_B4~dbin(move\_rec\_B4\_W2,N\_B4)

 Det\_W3\_B1~dbin(move\_rec\_B1\_W3,N\_B1)

 Det\_W3\_B2~dbin(move\_rec\_B2\_W3,N\_B2)

 Det\_W3\_B3~dbin(move\_rec\_B3\_W3,N\_B3)

 Det\_W3\_B4~dbin(move\_rec\_B4\_W3,N\_B4)

#Calculating number of birds that moved to each region.

# B1=Number that moved to B1

# Weighting the number of birds with each type of band, and adding those that moved to each region

 B1<-(moveband1[1]\*(N\_B1/NE))+(moveband2[1]\*(N\_B2/NE))+(moveband3[1]\*(N\_B3/NE))+(moveband4[1]\*(N\_B4/NE))

 B2<-(moveband1[2]\*(N\_B1/NE))+(moveband2[2]\*(N\_B2/NE))+(moveband3[2]\*(N\_B3/NE))+(moveband4[2]\*(N\_B4/NE))

 B3<-(moveband1[3]\*(N\_B1/NE))+(moveband2[3]\*(N\_B2/NE))+(moveband3[3]\*(N\_B3/NE))+(moveband4[3]\*(N\_B4/NE))

 B4<-(moveband1[4]\*(N\_B1/NE))+(moveband2[4]\*(N\_B2/NE))+(moveband3[4]\*(N\_B3/NE))+(moveband4[4]\*(N\_B4/NE))

 W1<-(moveband1[5]\*(N\_B1/NE))+(moveband2[5]\*(N\_B2/NE))+(moveband3[5]\*(N\_B3/NE))+(moveband4[5]\*(N\_B4/NE))

 W2<-(moveband1[6]\*(N\_B1/NE))+(moveband2[6]\*(N\_B2/NE))+(moveband3[6]\*(N\_B3/NE))+(moveband4[6]\*(N\_B4/NE))

 W3<-(moveband1[7]\*(N\_B1/NE))+(moveband2[7]\*(N\_B2/NE))+(moveband3[7]\*(N\_B3/NE))+(moveband4[7]\*(N\_B4/NE))

}

#DATA

#First 2 lines are unused

#Det\_B1\_B3= number of birds recovered in B1 with band type 3 (B3)

list(a\_B1=1,b\_B1=999,a\_B2=1,b\_B2=999,a\_B3=1,b\_B3=999,a\_B4=1.25,b\_B4=48.75,a\_W1=0.6,b\_W1=49.4, a\_W2=21.5,b\_W2=28.5, a\_W3=26.55,b\_W3=23.45,

Det\_B1\_B1=0, Det\_B1\_B2=0, Det\_B1\_B3=0,Det\_B1\_B4=0,

Det\_B2\_B1=0, Det\_B2\_B2=0, Det\_B2\_B3=0,Det\_B2\_B4=0,

Det\_B3\_B1=0, Det\_B3\_B2=0, Det\_B3\_B3=0,Det\_B3\_B4=0,

Det\_B4\_B1=0, Det\_B4\_B2=2, Det\_B4\_B3=0,Det\_B4\_B4=0,

Det\_W1\_B1=0, Det\_W1\_B2=1, Det\_W1\_B3=0,Det\_W1\_B4=0,

Det\_W2\_B1=0, Det\_W2\_B2=32, Det\_W2\_B3=2,Det\_W2\_B4=0,

Det\_W3\_B1=0, Det\_W3\_B2=34, Det\_W3\_B3=7,Det\_W3\_B4=1,

est\_B1=0,est\_B2=215.625,est\_B3=18,est\_B4=1.408)