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### USFWS Collision Fatality Estimate Model Code ###

RPath<-" /Projects/Eagles/R"
# RPath<-"R"
sapply(c("FatalFcns", "DistFcns", "rvsmry"), function(iFcn)
  invisible(source(paste(RPath, "/", iFcn, ".R", sep=""))))
)

## Analysis Inputs ##

PlotFile<-NULL
# PlotFile<-"FatalPlot.jpg"

UCI<-c(0.5,0.8,0.9,0.95)

require(rv)
nSim<-100000
setnsims(nSim)
getnsims()

### Survey Inputs ###

nSvy<-nrow(ExpSvy)
cSvy<-(rownames(ExpSvy))

SmpHrKM2<-with(ExpSvy, nCnt*CntHr*CntKM2)
ExpFac<-Days*LtHrPerDay*HzKM2

HzKM2PT<-HzKM2/nTurbine

# Calculate the fatalities and store as a temporary object.
tmp<-
with(ExpSvy, mapply(simFatal, EMin=EMin, SmpHrKM2=SmpHrKM2, ExpFac=ExpFac,
  SIMPLIFY=FALSE
))

# R code to get the survey specific simulations in an rv vector.
Fatalities<-rvnorm(nSvy)
Exp<-data.frame(Mean=rep(NA, nSvy), SD=NA, row.names=cSvy)
for(i in 1:nSvy){
# i<-1
  Fatalities[i]<-tmp[[i]]
  Exp[i,]<-attr(tmp[[i]], "Exp")
}
rm(tmp)
names(Fatalities)<-cSvy

# Summarize the surveys, including a total if needed.
nSvy<-length(Fatalities)
if(is.null(nSvy))nSvy<-1
FatalStats<-RVSmry(cSvy, Fatalities, probs=UCI)
if(AddTot){
  FatalStats<-rbind(
    FatalStats,

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    RVSmry("Total",sum(Fatalities),probs=UCI)
  )
}

# Look at the results
cat(cProject,"\n")
#Number of Turbines
print(nTurbine)
#Hazardous Area Per Turbine (km^2)
print(HzKM2PT)
print(ExpSvy)
#Exposure rate
print(Exp,digits=3)
#Annual Collision Fatalities
print(FatalStats,digits=2)

# Plots
nPlot<-nSvy+as.integer(AddTot)
nCol<-floor(sqrt(nPlot))
nRow<-ceiling(nPlot/nCol)
xlim<-range(rvrage(Fatalities))

if(!is.null(PlotFile))jpeg(PlotFile)
par(mfrow=c(nRow,nCol))
for(iPlot in 1:nSvy){
# iPlot<-1
  plotFatal(Fatalities[iPlot],probs=UCI,
# xlim=xlim,add=FALSE, # uncomment this line to put the graphs for all
of the strata
# on the same scale
  main=cSvy[iPlot])
}
if(AddTot)plotFatal(sum(Fatalities),main="Total")
if(!is.null(PlotFile))dev.off()

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