**#### Power analysis for different samples sizes ####**

# give the categories in the population

categories = c("M","F")

# give the different capture probabilities for p1M, p1F, p2M and p2F

delta = 0.04 # difference between the capture probability of male and female at each sample time

considered the delta values 0, 0.01, 0.02, 0.03, 0.04, 0.05, 0.06, 0.07, 0.08, 0.09, 0.1

pm1 = 0.08

pm2 = 0.04

cap.prob = c( pm1, pm1+delta, pm2, pm2+delta)

# give the category proportions ( total should add up to 1)

lambda= c(0.6, 0.4)

# give the subsample proportions for the time 1 and 2

theta = c(0.8, 0.5)

# total numbers individuals capture for the study

sample.size = 1000

Considered the power at sample sizes 1000, 2000, 3000, 4000

alpha = 0.05

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DeltaP | power1000 | power2000 | power3000 | power4000 |
| 0 | 0.05 | 0.05 | 0.05 | 0.05 |
| 0.01 | 0.096 | 0.147 | 0.202 | 0.257 |
| 0.02 | 0.219 | 0.404 | 0.57 | 0.703 |
| 0.03 | 0.387 | 0.681 | 0.856 | 0.941 |
| 0.04 | 0.559 | 0.864 | 0.967 | 0.993 |
| 0.05 | 0.704 | 0.951 | 0.994 | 0.999 |
| 0.06 | 0.812 | 0.984 | 0.999 | 0.999 |
| 0.07 | 0.885 | 0.995 | 0.999 | 0.999 |
| 0.08 | 0.931 | 0.998 | 0.999 | 0.999 |
| 0.09 | 0.96 | 0.999 | 0.999 | 1 |
| 0.1 | 0.977 | 0.999 | 0.999 | 1 |

