

Northern Harrier (*Circus hudsonius*), NAOI, and Other Interior Sum Raptor Statistics

Log Cape May: Shapiro-Wilk  $W = 0.939$ ,  $P = 0.053$

$3.29692 - (0.008437 \times \text{year})$ ,  $R^2 = 0.187$ ,  $P = 0.009$

$AIC_C = -114.25$  (second-order =  $-112.08$ )

residuals  $W = 0.966$ ,  $P = 0.334$

Log Hawk Mountain:  $W = 0.944$ ,  $P = 0.076$

$2.56155 - (0.01331 \times \text{year})$ ,  $R^2 = 0.573$ ,  $P < 0.001$

$AIC_C = -144.03$  (second-order =  $-142.80$ )

residuals  $W = 0.960$ ,  $P = 0.227$

Log Holiday Beach:  $W = 0.955$ ,  $P = 0.161$

$2.98622 - (0.005727 \times \text{year})$ ,  $R^2 = 0.078$ ,  $P = 0.103$

$AIC_C = -106.53$  (second-order =  $-105.25$ )

residuals  $W = 0.928$ ,  $P = 0.024$

Log Hawk Ridge:  $W = 0.970$ ,  $P = 0.456$

$2.48725 + (0.007653 \times \text{year})$ ,  $R^2 = 0.123$ ,  $P = 0.039$

$AIC_C = -103.64$  (second-order =  $-101.18$ )

residuals  $W = 0.954$ ,  $P = 0.156$

Log HR+HB:  $W = 0.958$ ,  $P = 0.203$

$3.10491 - (0.0009721 \times \text{year})$ ,  $R^2 = 0.003$ ,  $P = 0.7538$

$AIC_C = -113.90$  (second-order =  $-111.89$ )

residuals  $W = 0.959$ ,  $P = 0.209$

Log HB+HM:  $W = 0.960$ ,  $P = 0.232$

$3.12798 - (0.007447 \times \text{year})$ ,  $R^2 = 0.165$ ,  $P = 0.015$

$AIC_C = -117.61$  (second-order =  $-116.26$ )

residuals  $W = 0.940$ ,  $P = 0.055$

Log HR+HM:  $W = 0.977$ ,  $P = 0.664$

$2.81481 + (0.0003126 \times \text{year})$ ,  $R^2 = 0.000$ ,  $P = 0.907$

$AIC_C = -123.89$  (second-order =  $-121.35$ )

residuals  $W = 0.977$ ,  $P = 0.663$

Log HR+HB+HM (= Interior Sum):  $W = 0.962$ ,  $P = 0.256$

$3.21275 - (0.002873 \times \text{year})$ ,  $R^2 = 0.031$ ,  $P = 0.310$

$AIC_C = -120.74$  (second-order =  $-118.59$ )

residuals  $W = 0.964$ ,  $P = 0.292$

Log HR+HB+HM (= Interior Sum):  $W = 0.962, P = 0.256$   
 $3.21496 - (0.002839 \times \text{year}) - (0.06235 \times \text{NAOI}), R^2 = 0.1391, P = 0.091$   
 $\text{AIC}_C = -122.31$  (second-order = -114.79)  
 residuals  $W = 0.974, P = 0.549$

Log Derby Hill (spring before):  $W = 0.9801, P = 0.799$   
 $2.87056 - (0.006569 \times \text{year}), R^2 = 0.220, P = 0.004$   
 $\text{AIC}_C = -138.90$  (second-order = -136.64)  
 residuals  $W = 0.962, P = 0.262$

Log Derby Hill (spring after):  $W = 0.975, P = 0.594$   
 $2.85754 - (0.00639 \times \text{year}), R^2 = 0.212, P = 0.005$   
 $\text{AIC}_C = -139.17$  (second-order = -136.65)  
 residuals  $W = 0.951, P = 0.126$

Log Derby Hill (all years):  $W = 0.982, P = 0.806$   
 $2.87276 - (0.006748 \times \text{year}), R^2 = 0.244, P = 0.002$   
 $\text{AIC}_C = -144.01$  (second-order = -141.63)  
 residuals  $W = 0.958, P = 0.186$

Log Cape May (September):  $W = 0.966, P = 0.339$   
 $2.77368 - (0.01368 \times \text{year}), R^2 = 0.374, P < 0.001$   
 $\text{AIC}_C = -113.74$  (second-order = -111.98)  
 residuals  $W = 0.977, P = 0.668$

Log Cape May (October):  $W = 0.950, P = 0.114$   
 $2.96416 - (0.008289 \times \text{year}), R^2 = 0.169, P = 0.014$   
 $\text{AIC}_C = -111.06$  (second-order = -108.82)  
 residuals  $W = 0.971, P = 0.462$

Log Cape May (November):  $W = 0.954, P = 0.152$   
 $2.62202 - (0.003394 \times \text{year}), R^2 = 0.017, P = 0.460$   
 $\text{AIC}_C = -86.623$  (second-order = -84.203)  
 residuals  $W = 0.952, P = 0.131$

Log Interior Sum (August):  $W = 0.980, P = 0.754$   
 $1.62730 + (0.003016 \times \text{year}), R^2 = 0.027, P = 0.345$   
 $\text{AIC}_C = -112.21$  (second-order = -110.66)  
 residuals  $W = 0.980, P = 0.748$

Log Interior Sum (September):  $W = 0.975, P = 0.607$   
 $2.86190 - (0.001971 \times \text{year}), R^2 = 0.012, P = 0.534$   
 $\text{AIC}_C = -112.48$  (second-order = -110.18)  
 residuals  $W = 0.977, P = 0.675$

Log Interior Sum (October):  $W = 0.965, P = 0.320$   
 $2.78516 - (0.003614 \times \text{year}), R^2 = 0.041, P = 0.242$   
 $AIC_C = -114.87$  (second-order =  $-112.51$ )  
 residuals  $W = 0.967, P = 0.364$

Log Interior Sum (November):  $W = 0.982, P = 0.810$   
 $2.34204 - (0.006063 \times \text{year}), R^2 = 0.068, P = 0.131$   
 $AIC_C = -96.975$  (second-order =  $-94.872$ )  
 residuals  $W = 0.976, P = 0.636$

Raw Interior Sum:  $W = 0.940, P = 0.056$   
 $1750.74 - (11.0109 \times \text{year}), R^2 = 0.038, P = 0.262$   
 $AIC_C = 449.69$  (second-order =  $450.87$ )  
 residuals  $W = 0.952, P = 0.130$

Interior Sum  $r_t$ :  $W = 0.956, P = 0.185$

Raw Cape May:  $W = 0.906, P = 0.006$   
 $2097.50 - (30.6577 \times \text{year}), R^2 = 0.200, P = 0.007$   
 $AIC_C = 456.67$  (second-order =  $458.84$ )  
 residuals  $W = 0.974, P = 0.575$

Raw Derby Hill:  $W = 0.863, P < 0.001$   
 $762.814 - (9.2287 \times \text{year}), R^2 = 0.194, P = 0.007$   
 $AIC_C = 386.43$  (second-order =  $388.89$ )  
 residuals  $W = 0.832, P < 0.001$

NAOI (September—October—November):  $W = 0.965, P = 0.326$   
 $0.0356 + (0.0005462 \times \text{year}), R^2 < 0.001, P = 0.971$   
 $AIC_C = -3.3051$  (second-order =  $-2.9789$ )  
 residuals  $W = 0.957, P = 0.182$

NAOI (September):  $W = 0.964, P = 0.302$

NAOI (October):  $W = 0.982, P = 0.827$

NAOI (November):  $W = 0.975, P = 0.596$

NAOI (March—April—May):  $W = 0.970, P = 0.452$

- Log Interior Sum Turkey Vulture (*Cathartes aura*):  $W = 0.959$ ,  $P = 0.218$   
 $3.89817 + (0.02439 \times \text{year})$ ,  $R^2 = 0.865$ ,  $P < 0.001$   
 $\text{AIC}_C = -156.21$  (second-order =  $-155.89$ )  
 residuals  $W = 0.944$ ,  $P = 0.074$   
 autocorrelation  $P < 0.05$ : at 4 yr (0.353)
- Log Interior Sum Osprey (*Pandion haliaetus*):  $W = 0.962$ ,  $P = 0.254$   
 $2.84955 + (0.02479 \times \text{year}) - (0.0007442 \times \text{year}^2)$ ,  $R^2 = 0.047$ ,  $P = 0.210$   
 $\text{AIC}_C = -187.19$  (linear =  $-161.18$ , third-order =  $-185.27$ )  
 residuals  $W = 0.922$ ,  $P = 0.016$   
 autocorrelation  $P < 0.05$ : none
- Log Interior Sum Bald Eagle (*Haliaeetus leucocephalus*):  $W = 0.866$ ,  $P = 0.001$   
 $1.98289 + (0.09343 \times \text{year}) - (0.001328 \times \text{year}^2)$ ,  $R^2 = 0.911$ ,  $P < 0.001$   
 $\text{AIC}_C = -123.82$  (linear =  $-108.70$ , third-order =  $-122.85$ )  
 residuals  $W = 0.966$ ,  $P = 0.349$   
 autocorrelation  $P < 0.05$ : at 1 yr (0.502)
- Log Interior Sum Sharp-shinned Hawk (*Accipiter striatus*):  $W = 0.971$ ,  $P = 0.477$   
 $4.52878 - (0.002313 \times \text{year})$ ,  $R^2 = 0.100$ ,  $P = 0.0064$   
 $\text{AIC}_C = -179.47$  (second-order =  $-178.76$ )  
 residuals  $W = 0.972$ ,  $P = 0.487$   
 autocorrelations  $P < 0.05$ : at 2 yr (0.352), 4 yr (0.401)
- Log Interior Sum Cooper's Hawk (*Accipiter cooperii*):  $W = 0.941$ ,  $P = 0.060$   
 $2.96243 + (0.02673 \times \text{year}) - (0.000779 \times \text{year}^2)$ ,  $R^2 = 0.372$ ,  $P = 0.001$   
 $\text{AIC}_C = -156.26$  (linear =  $-142.99$ , third-order =  $-154.01$ )  
 residuals  $W = 0.970$ ,  $P = 0.458$   
 autocorrelation  $P < 0.05$ : none
- Log Interior Sum Northern Goshawk (*Accipiter gentilis*):  $W = 0.956$ ,  $P = 0.172$   
 $2.66869 - (0.01104 \times \text{year})$ ,  $R^2 = 0.134$ ,  $P = 0.031$   
 $\text{AIC}_C = -81.344$  (second-order =  $-80.624$ )  
 residuals  $W = 0.984$ ,  $P = 0.869$   
 autocorrelation  $P < 0.05$ : at 1 yr (0.539)
- Log Interior Sum Red-shouldered Hawk (*Buteo lineatus*):  $W = 0.962$ ,  $P = 0.257$   
 $3.17932 - (0.01077 \times \text{year})$ ,  $R^2 = 0.483$ ,  $P < 0.001$   
 $\text{AIC}_C = -146.11$  (second-order =  $-144.45$ )  
 residuals  $W = 0.982$ ,  $P = 0.822$   
 autocorrelation  $P < 0.05$ : none

Log Interior Sum Broad-winged Hawk (*Buteo platypterus*):  $W = 0.946$ ,  $P = 0.085$   
 $4.88335 + (0.01065 \times \text{year}) - (0.0004855 \times \text{year}^2)$ ,  $R^2 = 0.218$ ,  $P = 0.020$   
 $\text{AIC}_C = -121.05$  (linear =  $-120.88$ , third-order =  $-118.84$ )  
 residuals  $W = 0.962$ ,  $P = 0.272$   
 autocorrelation  $P < 0.05$ : none

Log Interior Sum Red-tailed Hawk (*Buteo jamaicensis*):  $W = 0.960$ ,  $P = 0.234$   
 $4.11232 - (0.003483 \times \text{year}) + (0.003266 \times \text{year}^2) - (0.000212 \times \text{year}^3) +$   
 $(0.00000348 \times \text{year}^4)$   $R^2 = 0.477$ ,  $P < 0.001$   
 $\text{AIC}_C = -166.31$  (linear =  $-156.83$ , second-order =  $-163.37$ , third-order =  $-165.67$ , fifth-  
 order =  $-165.20$ )  
 residuals  $W = 0.969$ ,  $P = 0.428$   
 autocorrelation  $P < 0.05$ : none

Log Interior Sum Rough-legged Hawk (*Buteo lagopus*):  $W = 0.960$ ,  $P = 0.230$   
 $2.43454 - (0.001128 \times \text{year})$ ,  $R^2 = 0.002$ ,  $P = 0.817$   
 $\text{AIC}_C = -82.255$  (second-order =  $-79.701$ )  
 residuals  $W = 0.962$ ,  $P = 0.265$   
 autocorrelation  $P < 0.05$ : at 4 yr (0.367)

Log Interior Sum Golden Eagle (*Aquila chrysaetos*):  $W = 0.879$ ,  $P = 0.001$   
 $1.74406 + (0.06914 \times \text{year}) - (0.002462 \times \text{year}^2) + (0.00003059 \times \text{year}^3)$   $R^2 = 0.850$ ,  
 $P < 0.001$   
 $\text{AIC}_C = -169.55$  (linear =  $-149.09$ , second-order =  $-168.67$ , fourth-order =  $-166.73$ )  
 residuals  $W = 0.969$ ,  $P = 0.425$   
 autocorrelation  $P < 0.05$ : none

Log Interior Sum American Kestrel (*Falco sparverius*):  $W = 0.970$ ,  $P = 0.445$   
 $3.45946 + (0.07 \times \text{year}) - (0.004293 \times \text{year}^2) + (0.00006608 \times \text{year}^3)$   $R^2 = 0.592$ ,  
 $P < 0.001$   
 $\text{AIC}_C = -150.13$  (linear =  $-136.02$ , second-order =  $-143.91$ , fourth-order =  $-149.47$ )  
 residuals  $W = 0.909$ ,  $P = 0.007$   
 autocorrelation  $P < 0.05$ : at 3 yr ( $-0.395$ )

Log Interior Sum Merlin (*Falco columbarius*):  $W = 0.838$ ,  $P < 0.001$   
 $1.69563 + (0.14541 \times \text{year}) - (0.007117 \times \text{year}^2) + (0.0001115 \times \text{year}^3)$   $R^2 = 0.854$ ,  
 $P < 0.001$   
 $\text{AIC}_C = -153.83$  (linear =  $-119.92$ , second-order =  $-133.68$ , fourth-order =  $-151.40$ )  
 residuals  $W = 0.966$ ,  $P = 0.346$   
 autocorrelation  $P < 0.05$ : none

Log Interior Sum Peregrine Falcon (*Falco peregrinus*):  $W = 0.884$ ,  $P = 0.002$

$$1.51321 + (0.08643 \times \text{year}) - (0.00351 \times \text{year}^2) + (0.00005164 \times \text{year}^3) R^2 = 0.867, \\ P < 0.001$$

$AIC_c = -161.52$  (linear =  $-145.03$ , second-order =  $-156.54$ , fourth-order =  $-158.64$ )

residuals  $W = 0.968$ ,  $P = 0.401$

autocorrelation  $P < 0.05$ : none