

FISHING EFFORT AND PREDATORY BEHAVIOR OF BROWN PELICANS (*Pelecanus occidentalis*) ON THE CENTRAL PACIFIC COAST OF COSTA RICA

Lauren Hebert, Colorado College

Advisor: MS Mike McCoy

On the central Pacific coast of Costa Rica, a 2010 regulation from the *Costa Rican Fisheries Institute* (INCOPESCA) was implemented prohibiting commercial trawling boats within a water depth of ≤ 15 meters along the shoreline. I studied brown pelican (*Pelecanus occidentalis*) behavior at two sites within this marine zone of responsible fishing; Tárcoles (N09°45.376' - W084°37.642'), a fishing town, and Punta Leona (N09°42.299' - W084°39.853'), a hotel and nature reserve. My objective was to determine the relationship between fishing presence and predatory behavior of brown pelicans within this zone during March and April of 2013. Other objectives were to determine patterns in dive height, dive success, age distribution, and distance from shore of diving pelicans. I collected 21 days of data; 13 at Tárcoles and 8 at Punta Leona.

Overall, brown pelicans had greater dive success at Punta Leona than at Tárcoles ($P=0.09$). Juveniles had slightly more success than matures combining both sites ($P=0.09$). When divided by age, juvenile pelicans had significantly different success between the sites ($P=0.013$), while matures did not ($P=0.69$). As was expected, mature pelicans initiated their dives from a greater height ($P<0.0001$). Mean dives per hour throughout the whole study were greater at Tárcoles than at Punta Leona ($P=0.08$). Mature dives per hour and juvenile dives per hour had a positive relationship ($P=0.0006$). No relationship was found between average total daily boat presence and daily mean percent dive success ($P=0.94$). A pattern appeared to be developing wherein pelican have greater dive success closer to the full moon ($P=0.43$).

The finding of almost significantly greater juvenile mean percent success goes against the expectation that matures have more dive success than juveniles. However, factors such as changing season and proximity to the brown pelican-breeding season may have affected this result. The consistency in mature pelican behavior between the sites suggests other factors are affecting juvenile dive success besides site. Local enhancement (Brandt 1985) seems to be occurring when comparing daily dives per hour, wherein juvenile pelicans feed where mature pelicans feed, and vice versa. A long-term study would be required to investigate the relationship of dive success to moon phase and fishing presence more fully.