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**A Time Budget Study of Wintering Mallards (*Anas platyrhynchos*) on the  
Southern High Plains of Texas**

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**ABSTRACT**

The Southern High Plains (SHP) of Texas is a tableland stretching across the Texas Panhandle and eastern New Mexico, USA. The SHP is a semi-arid region where the annual rainfall is less than 51cm. Wintering waterfowls are the most abundant wildlife resource occurring on this region due to 16,000-20,000 playa basins which collect irrigation water. As habitat for wintering waterfowl in the Central Flyway the playa region harbors over 1 million waterfowl. However, because of the playas' shallow depths and high evaporation rates regional agricultural practices depend on modification of playa basins into steep-sided pits that reduce its high evaporation rates to support for water storage and maximum availability of water for irrigation. The relationships between playa modifications and wintering waterfowl gain importance for three reasons:

- 1) Large number of playa lake modification reduced habitats because wintering waterfowls normally select natural wetlands over man-made or man-altered wetlands due to its food and cover.
- 2) The construction of 8-m wide terraces on one side of the pit was made to compensate loss of littoral zones on modified playa lakes. The terraces encourage plants such as pondweeds (*Potamogeton* spp.), cattails (*Typha* spp.), bulrushes (*Scirpus* spp.), smartweeds (*Polygonum* spp.), and millet (*Echinochloa crusgalli*) as well as macroinvertebrates

3) Corn is the major source of carbohydrates, and constitutes 93%, by volume of the winter diet of waterfowls, but it lacks in certain amino acids, vitamins, and certain minerals (especially calcium) than natural foods. The natural foods, therefore should be consumed to compensate the dietary deficiencies of a pure corn diet.

To investigate the diurnal activity patterns of wintering waterfowl time budget study of mallards (*Anas platyrhynchos*) was conducted into three habitat types; terraced pits, steep-sided pits, and open lakes. Seven activity patterns were different ( $P < 0.05$ ) among the three habitat types for wintering mallards. Terraced pits had the highest feeding activity (27.8%) and were higher ( $P < 0.001$ ) than steep-sided pits (11.2%) or open lakes (2.6%). The results imply that the terraced lakes give waterfowl greater opportunities to feed on natural seeds and aquatic invertebrates. Furthermore, although the abundance of invertebrates was not different between terraced pits and steep-sided pits the ducks spent 3 times as much time feeding in terraced pits due to the food availability.

Mallards using terraced pits spent more time feeding (32.4%) than in the other habitat types during the early winter. Hens fed more than drakes ( $P < 0.05$ ). Resting activity was different among habitat types and seasons. Resting activity was higher in paired (37.9%) than in unpaired mallards (25.8%). This suggests that paired mallards may have better body condition than unpaired birds, thus spending less time feeding and more time resting. Comfort activity was the highest during the September-October reflecting an adaptive metabolic strategy (e.g., comfort, feeding, and agonistic behavior) during periods of mild temperatures. Courtship activity was highest during November-December when birds were forming pair bonds. Alert activity was the lowest in open-lakes and agonistic activity was highest on terraced pits in which had the highest feeding activity. This study suggests that when offered a suitable habitat for aquatic feeding mallards spent more time feeding. Management of the SHP should attempt to preserve aquatic habitats capable of providing native foods as supplement for the high corn diet of mallards.