

Monarch Conservation Strategies for Texas Roadways: *Monarch Flight Diverters*

TxDOT Project 0-7022-01

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0-7022-01 – Project Objective (Feb 2023 – Nov 2025)

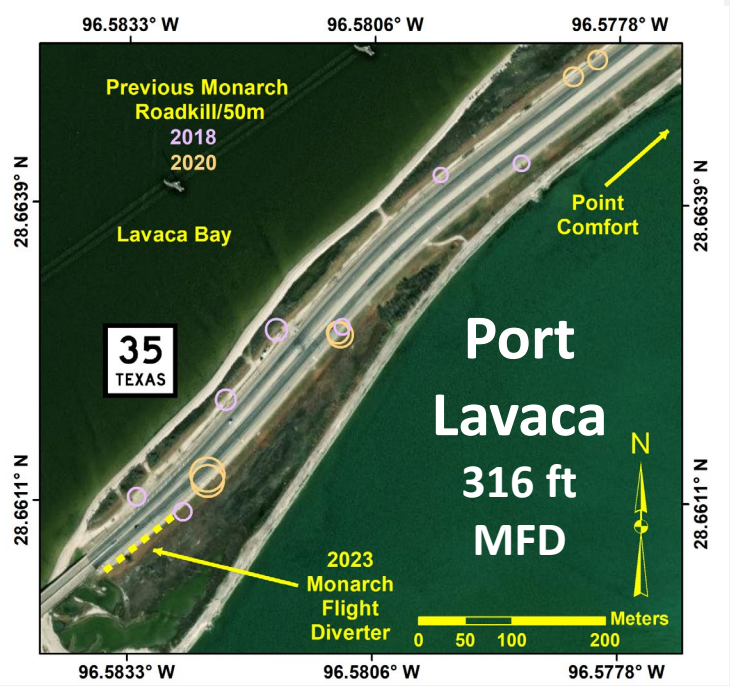
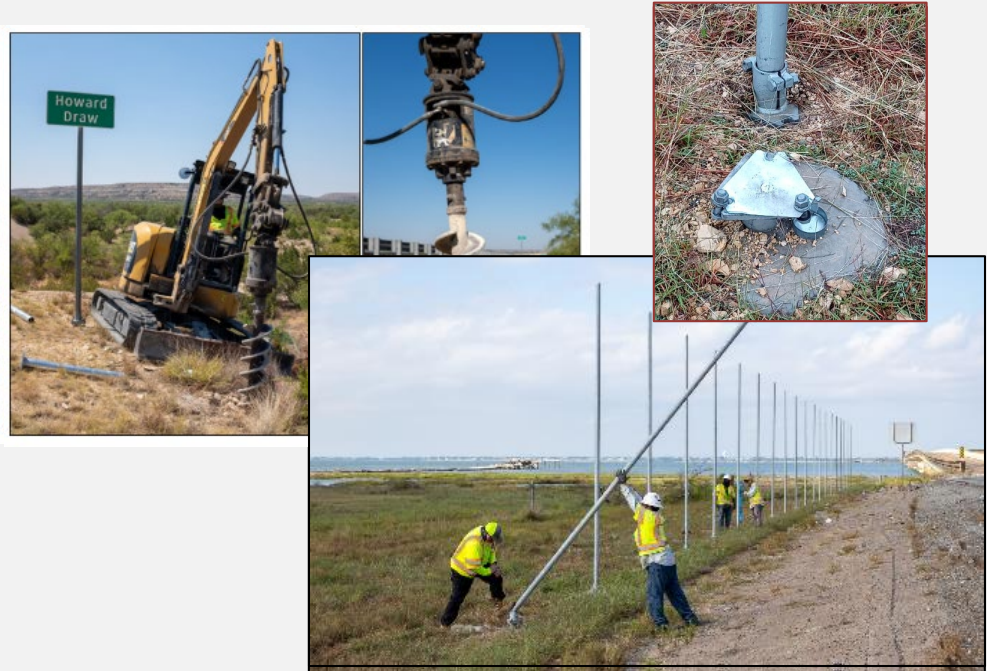
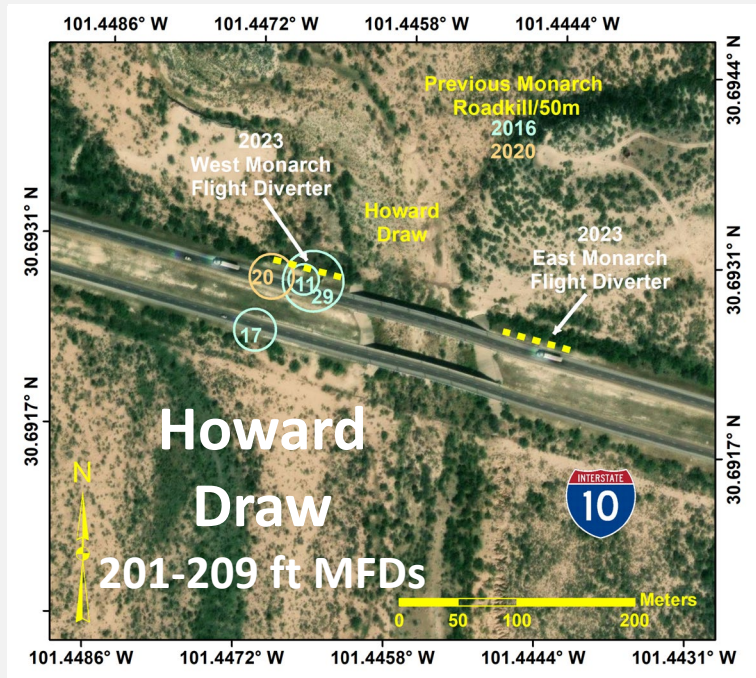
- Construct and evaluate a prototype Monarch Flight Diverter (MFD) for stability and netting types at Texas A&M, including reared monarch release



- Place MFD at two fall migration monarch roadkill hotspots and evaluate effectiveness in reducing roadkill
 - San Angelo District I-10 – Howard Draw
 - Yoakum District SH-35 – Point Comfort/Port Lavaca

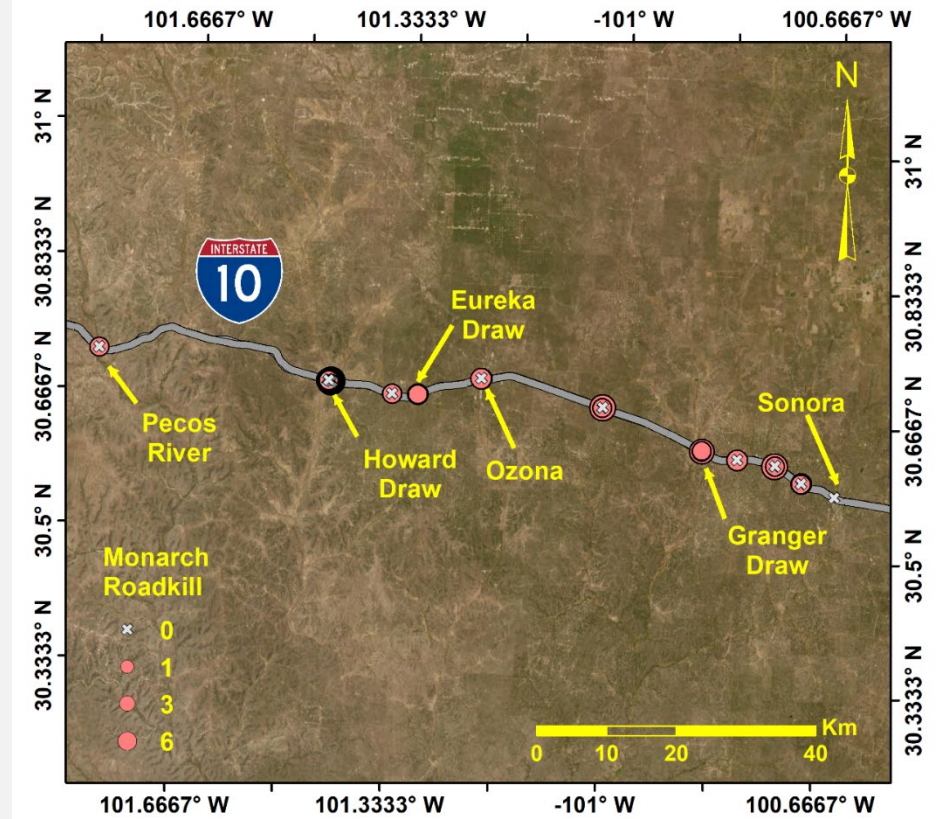
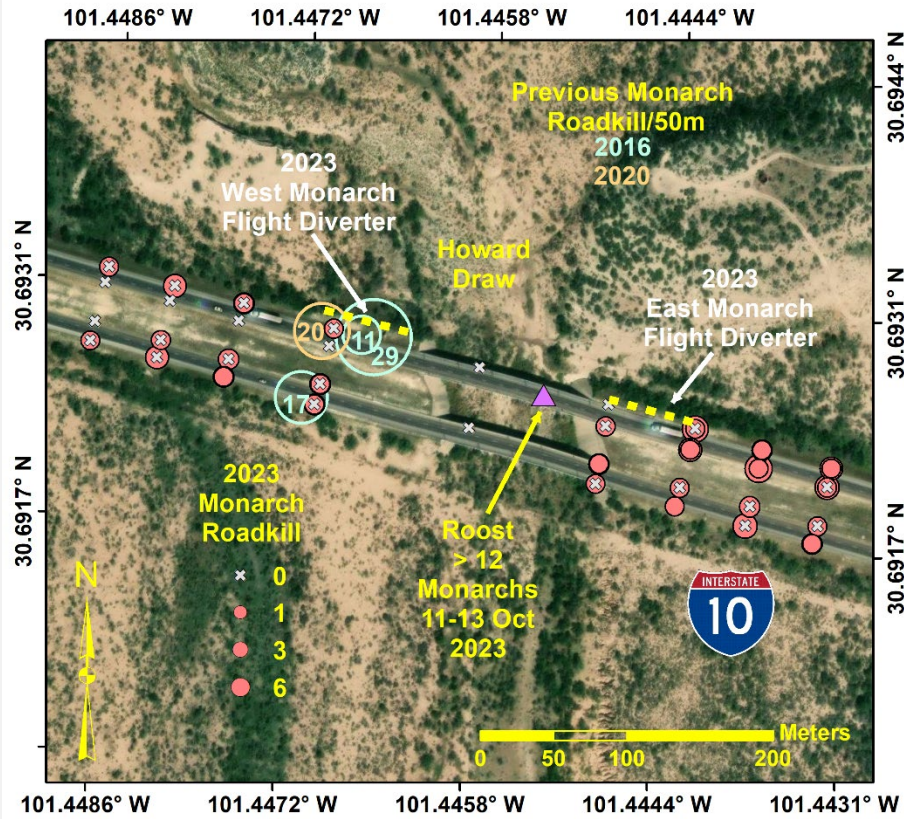


Installation of MFD – Posts & Foundation then Netting

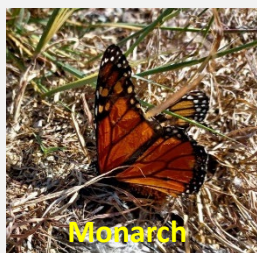


Fall 2023 Howard Draw and I-10 Monarch Roadkill per 55 Yds

Much lower monarch roadkill in 2023 (max 6 per 55 yds) than in 2016 and 2020 (20-29 per 55 yds)



Monarch roadkill maximum of about 6 per 55 yards at Howard Draw and Granger Draw



Monarch



Orange Sulphur



Variegated Fritillary



Tarantula Hawk

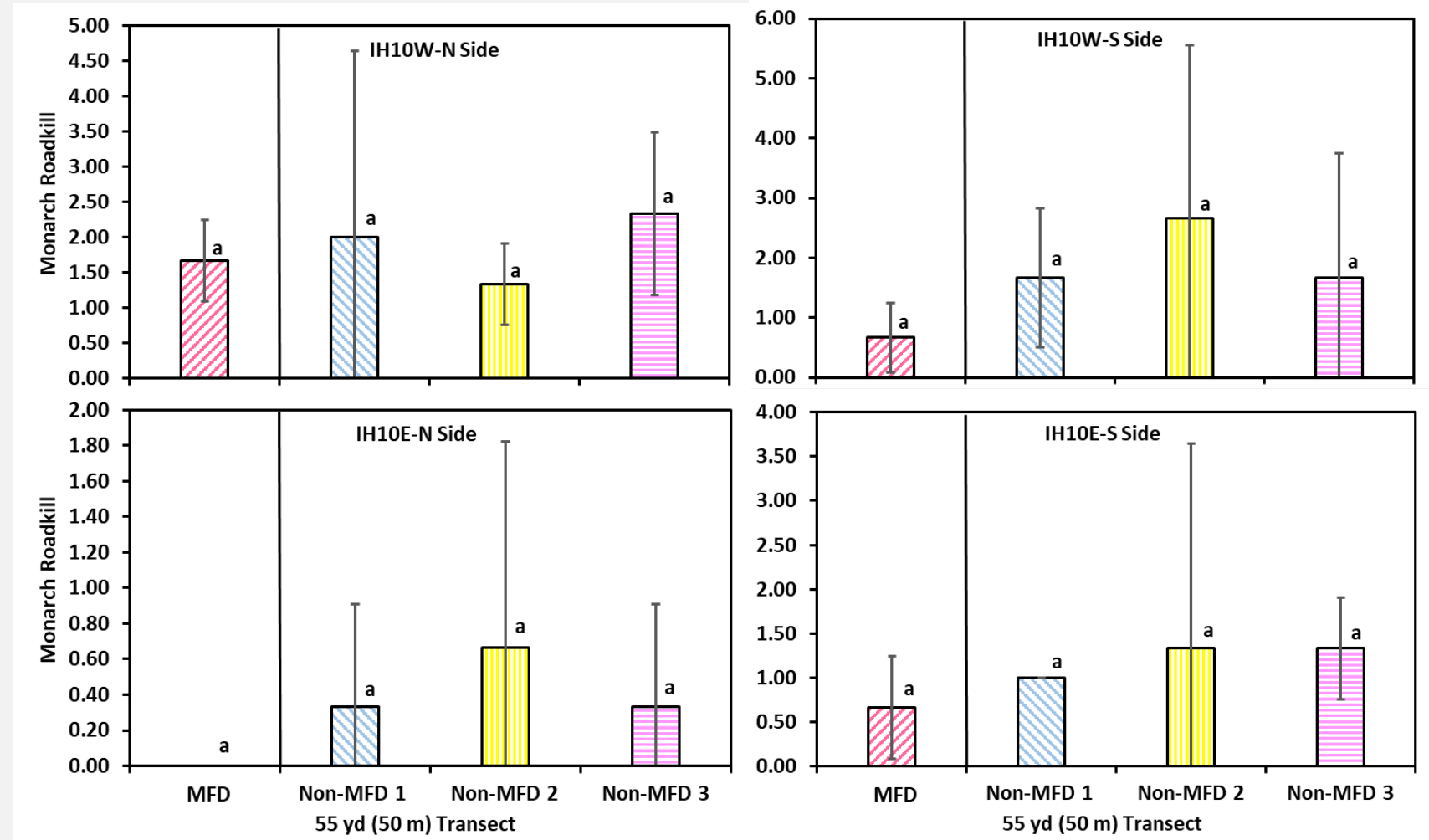


Dragonfly

Fall 2023 Howard Draw MFD and Non-MFD Roadkill per 55 Yds

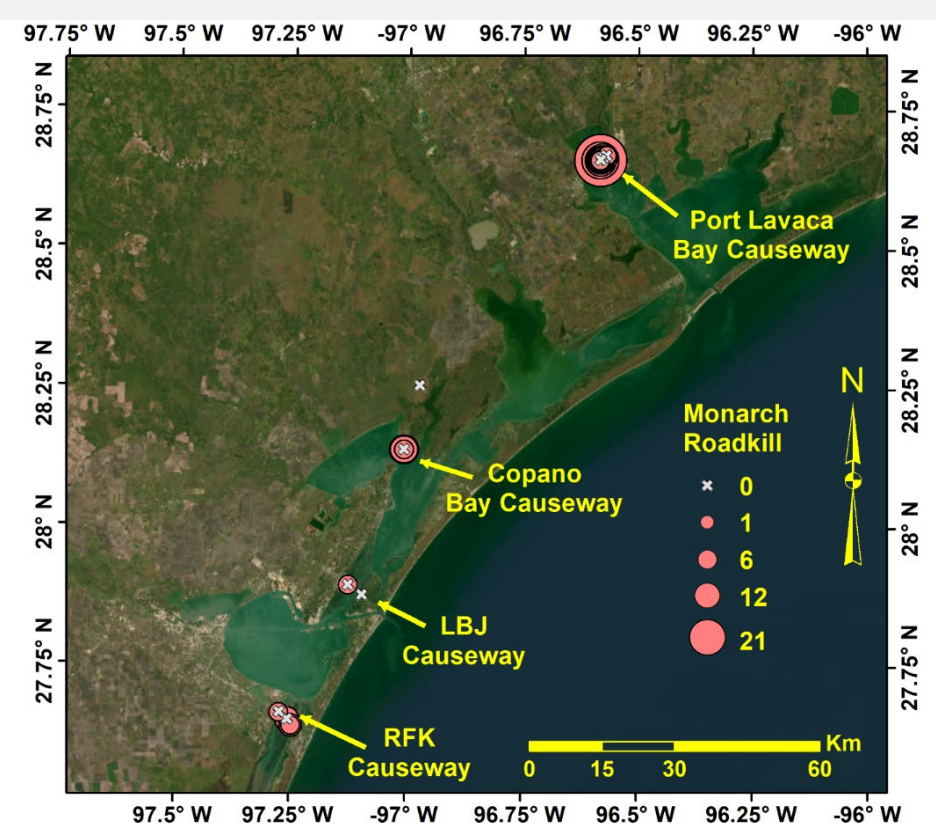
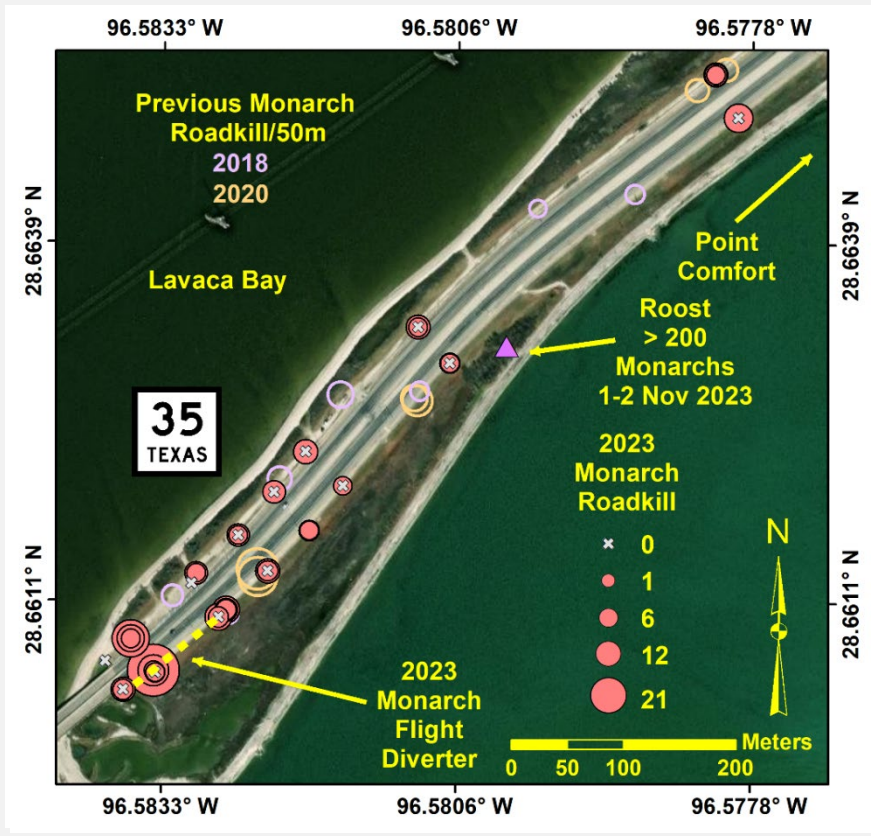
Howard Draw East Diverter

- Roadkill of zero to six monarchs per 3 dates
- Roadkill standard deviations of zero to three monarchs
- No significant differences in MFD and non-MFD roadkill due to high variability

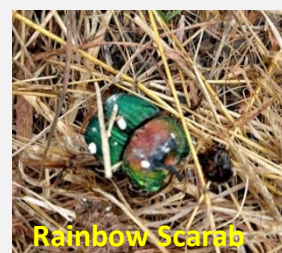
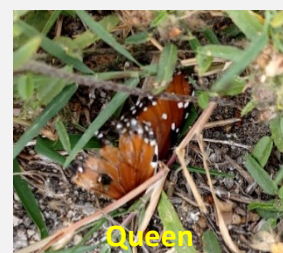
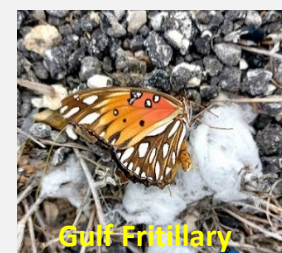
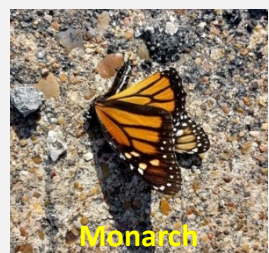


Fall 2023 Lavaca Bay and Coastal Monarch Roadkill per 55 Yds

Higher 2023 monarch roadkill of up to 21 per 55 yds compared to 2018 and 2020 (max 13 monarch roadkill per 55 yds)



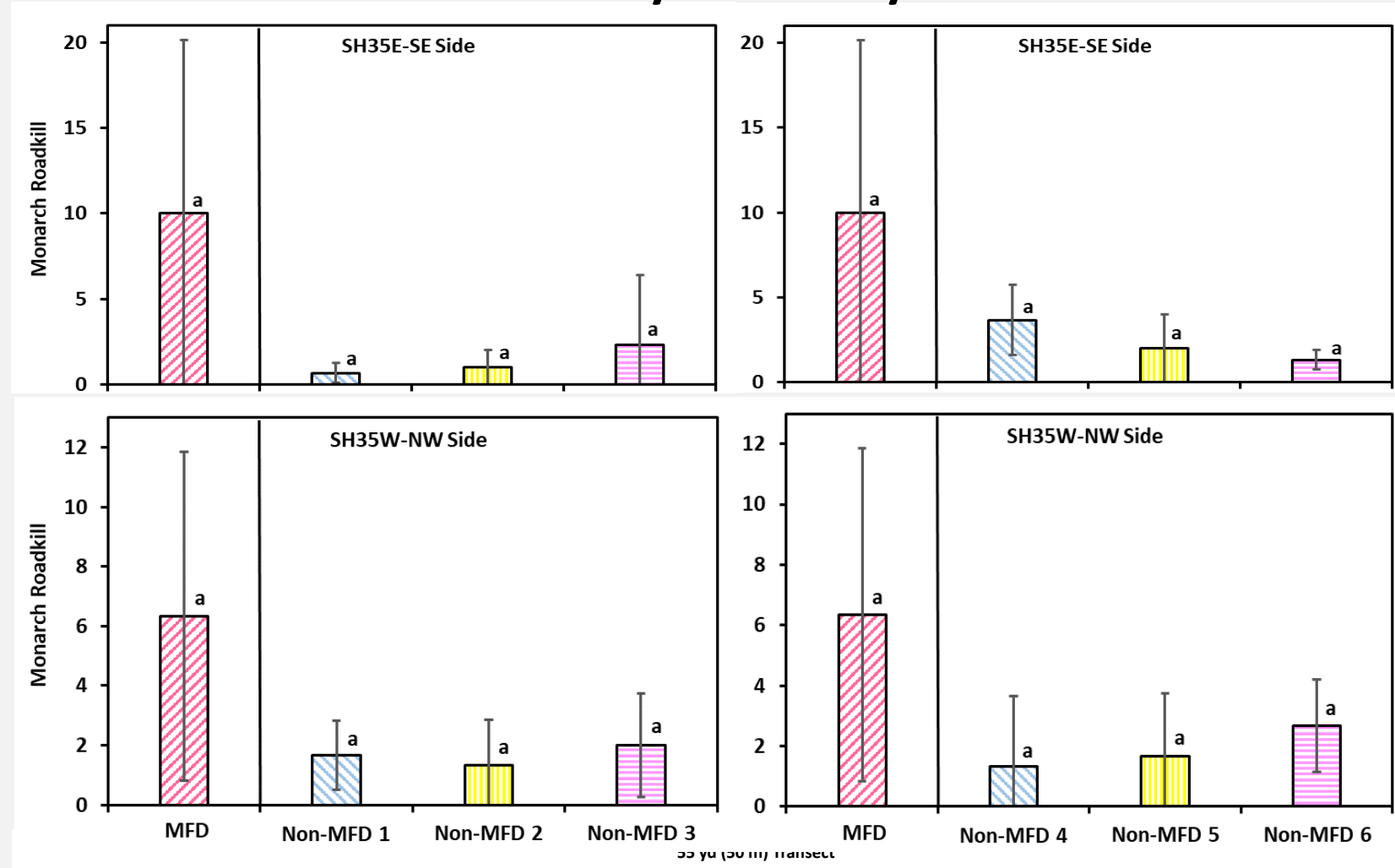
Highest 2023 monarch roadkill at Port Lavaca Bay Causeway MFD



Fall 2023 Port Lavaca MFD and Non-MFD Roadkill per 55 Yds

- Roadkill of zero to 21 monarchs per 3 dates
- Roadkill standard deviations of 0.5 to ten monarchs
- Non-significant trend for higher MFD roadkill compared to non-MFD due to high variability

Port Lavaca Bay Causeway Diverter



Preliminary Results on Monarch Flight Patterns at MFD



- Winds pushing MFD net away from road force monarchs down to road in headwinds after flying over MFD
- Winds pushing MFD net towards road allow monarchs to fly higher over traffic with tail winds after topping MFD
- Some monarchs observed flying around MFDs at both Howard Draw and Lavaca Bay
- A much higher proportion of monarchs were observed flying parallel to MFD at Lavaca Bay where monarchs appear to be mostly migrating along westerly direction parallel to roadway
- Lavaca Bay MFD may be diverting monarchs onto roadway
- Additional monarch roadkill data may reveal lower roadkill adjacent to Howard Draw MFD which is perpendicular to the southerly direction of the migration
- Shifting winds and flight patterns around MFDs led to high roadkill variability at both sites



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