Figure 1-2 Permit Area/Likelihood of Occurrence

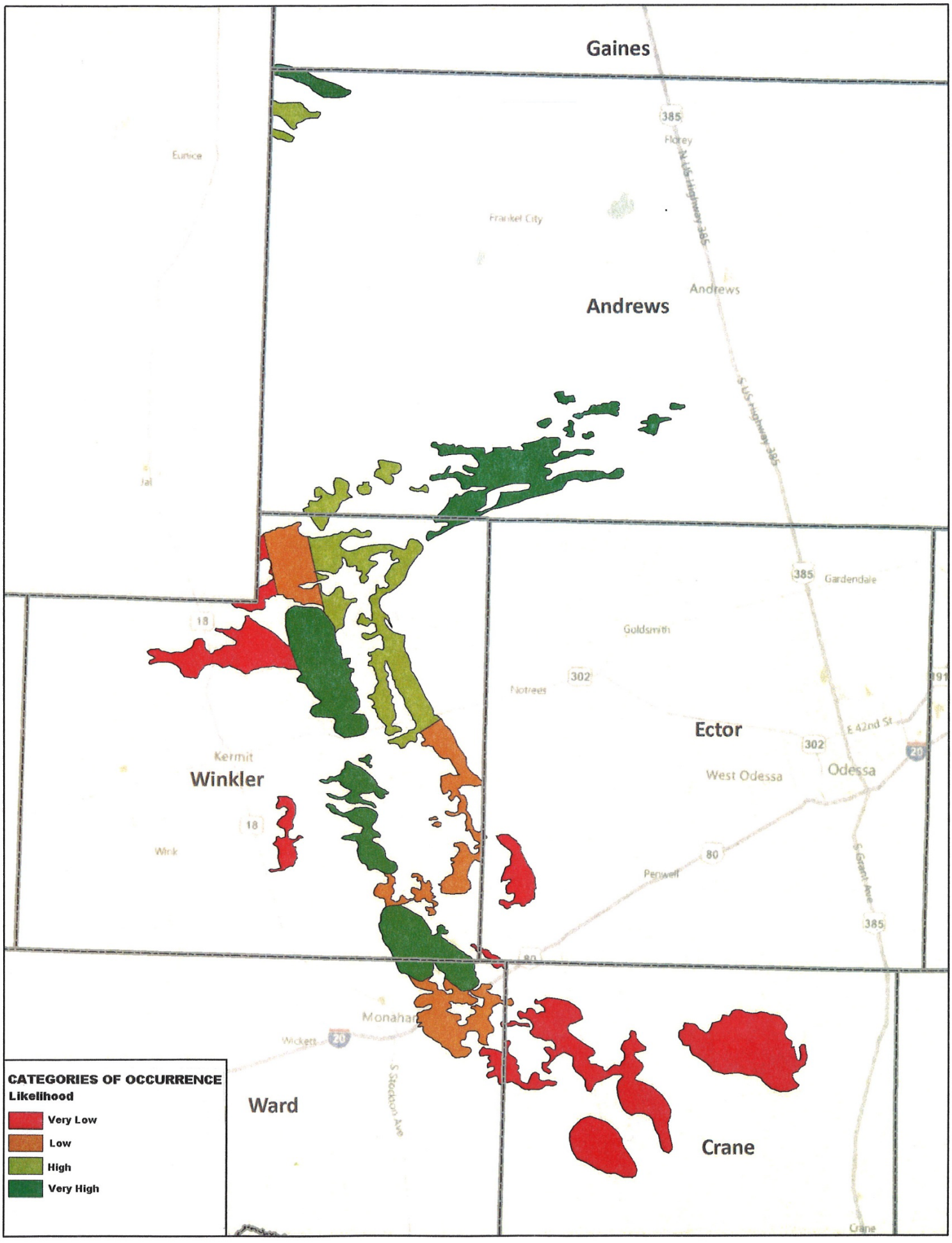
Gaines
Andrews
Winkler
Ector
Ward
Crane
Eunice
Jal
Kermit
Wink
Frankel City
Andrews
Florey
Gardendale
Goldsmith
Notrees
West Odessa
Odessa
Penwell
Monahans
Wickett
385
18
302
20
80
191
E 42nd St
S Grant Ave
S Stockton Ave
CATEGORIES OF OCCURRENCE
Likelihood
Very Low
Low
High
Very High

FIGURE 1-2 METHODOLOGY

Figure 1-2 was created by Dr. Toby Hibbitts of Texas A&M in May of 2011 and was used as the baseline of habitat suitable for DSL. The map was created using aerial photography to identify the shinnery dunes habitat. All historical museum records, all survey records from Laurencio et al. (2007), and recent survey information by Texas A&M was overlaid onto the potential habitat map. Habitat descriptions were also available for all of the surveys from Laurencio et al. (2007) and from the Summer 2011 Texas A&M effort. Areas that are Dark Green (Very High Likelihood of Occurrence) had positive results from multiple surveys or were areas that are known to have recently contained DSL (based on museum records within the last 20 years). Survey sites in the Dark Green areas also had habitat descriptions that were generally "Shinnery dunes with large open blowouts." Dune "complexes" (expanses of the same geologic dune formation) could also be identified from aerial photography and, unless survey data was available to indicate otherwise, entire dune "complexes" were considered the same likelihood of occurrence. Areas that are Light Green (High Likelihood of Occurrence) had some historical records or had few positive surveys. Survey site habitat descriptions in these areas were generally similar to those of Dark Green areas but the areas of good habitat were generally smaller. Orange areas (Low Likelihood of Occurrence) were areas where no records of DSL were known; however, these areas are in all cases in contact with areas of Dark Green or Light Green. Survey site habitat descriptions varied from "shinnery dunes with blowouts" to "some shinnery dunes with sparse blowouts and lots of mesquite in flats and blowouts." Areas that are Red (Very Low Likelihood of Occurrence) were areas where no DSL have been found in surveys and the habitat patches were usually separated from areas that were considered Dark Green or Light Green by patches of unsuitable habitat. Those Red areas that are connected to a Green area are obviously a different dune "complex" and the habitat within those areas was considered to not be ideal for DSL (e.g. the sites contained shinnery dunes but there were either few blowouts or the blowouts were grown in with grasses or mesquite). Otherwise the habitat within Red areas was similar to that observed in Orange areas. The main factors used when making decisions about likelihood of occurrence were survey results and specimen records. Habitat characteristics were used in areas where few surveys were conducted and in areas where different dune complexes came into contact. All areas (Dark Green to Red) of likelihood of occurrence can and do have what appears to be areas of good quality Suitable Habitat but other factors such as connectivity and survey results exclude those areas from having higher likelihoods of occurrence.

Based on this methodology, DSL Habitat in Figure 1-2 (*i.e*. the Permit Area) is classified by Texas A&M in four approximated gradients of likelihood of DSL occupancy, with the highest being Very High Likelihood of Occurrence (Dark Green), followed by High Likelihood of Occurrence (Light Green), Low Likelihood of Occurrence (Orange) and Very Low Likelihood of Occurrence (Red).