

## LPC Aerial Survey Gap Tolerance Thresholds

The use of helicopters to conduct aerial surveys for LPC leks is an effective method for covering the large, often inaccessible, landscapes of the southern Great Plains. Surveys are designed and flown as a series of north/south transects spaced 400 meters apart to allow for edge to edge coverage based on a 200 meter detection distance on either side of the transect line. Once surveys are completed, the GPS log from the flight is submitted to and processed by the WAFWA GIS lab to identify the surveyed areas. The surveyed areas is identified by buffering the flight lines by 200 meters. The identification of the surveyed area is important for identifying areas as being “cleared” of potential LPC presence since there are special development timing restrictions for areas near known LPC leks or in un-surveyed areas.

Small deviations in the flight line due to pilot error, wind, or intentionally avoiding features for safety resulted in gaps in the area identified as surveyed. These gaps rendered the surveys ineffective in “clearing” an area as surveyed and any projects in the area would still be held to the timing restrictions since the area was not completely surveyed.

A proposal was developed by the WAFWA GIS lab that attempted to identify spatial thresholds of flight line variation and the resulting gaps so that the unavoidable small gaps did not render the surveys useless while ensuring that the landscape remained surveyed to a degree thorough enough to consider it as “cleared” regarding the potential presence of LPC leks.

7/6/2015: First draft of the a proposed policy for identifying and dealing with flight line drift and survey area gaps was created and shared within WAFWA.

7/13/2015: Proposal was presented to the LPC Advisory Committee and after discussion and questions was a as presented by WAFWA staff as a recommendation from the LPCAC to the LPCIC at their next meeting for review and action.

7/17/2015: WAFWA summer meeting - LPC Initiative Council reviewed and approved a multipart Proposal that included a portion on aerial survey gap thresholds. This proposal recommended:

- a) Small sliver gaps up to 100 meters wide be considered as surveyed.
- b) Gaps larger than 100 meters wide be considered un-surveyed unless intentionally avoided for a documented safety reason (radio tower, house, feedlot...).
- c) Total large gaps cannot exceed 1% of the survey area.

The LPCIC approved the recommendation from the LPCAC, with direction to review the approved 1%, in light of new information regarding the fact that the 1% allowance would not be sufficient.

8/18/2015: The proposal was revised to include language of an overall gap allowances of approximately 5% of the survey area after realizations that no surveys were within the original 1% threshold.

9/30/2015: A proposal with the a threshold of “approximately 5%” was presented to the Science Committee. The Science Committee recommended changing from approximately 5% to “not to exceed 5%” to provide greater certainty.

10/27/2015: The recommendation from the Science committee to adjust the threshold to “not to exceed 5%” of the survey area was presented to the Advisory committee and the new proposal was accepted by the LPCAC.

12/8/2015:

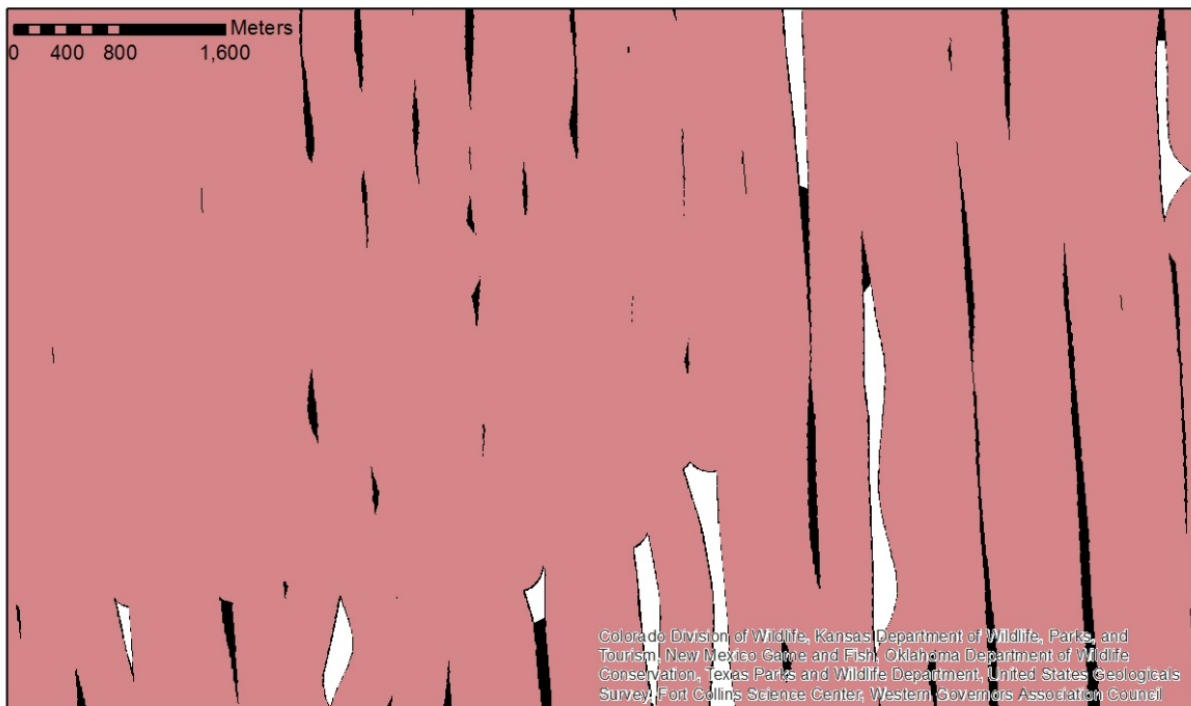
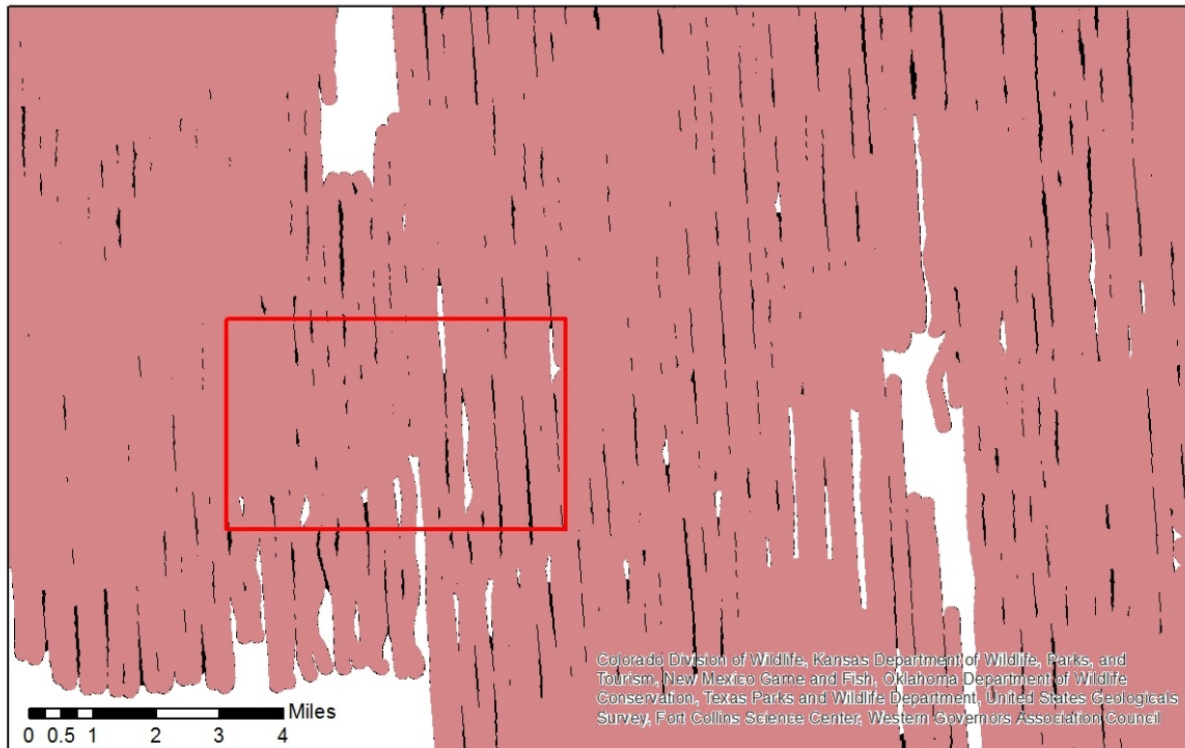
The revised recommendation was presented to the LPC Intuitive Council. The recommendation was approved as presented.

The final approved proposal specified that:

- a) Small sliver gaps up to 100 meters wide be considered as surveyed.
- b) Gaps larger than 100 meters wide be considered un-surveyed unless intentionally avoided for an acceptable safety reason (radio tower, house, feedlot...).
- c) Total large gaps cannot exceed 5% of the survey area.
  - a. If a surveyed area exceeds the 5% threshold, the less completely covered area may be trimmed away so that the more completely surveyed area (with <5% gaps) can remain mapped as a completed survey effort.

Figures 1-5 provide examples of these concepts and how they are applied.

Regional and close-up views of aerial survey data where the white "holes" depict remaining gaps, and black areas are the gaps that were "filled" to account for acceptable drift.



Gaps of less than approximately 100 meters wide are filled, while larger gaps are left as gaps in the survey coverage. These larger gaps are then assessed individually to determine the reason and acceptability of the gap.

Figure 1. Example view of how flight line transects leave a mixture of both small and large gaps in coverage.



Buffered flight lines with allowable small slivers from flight drift

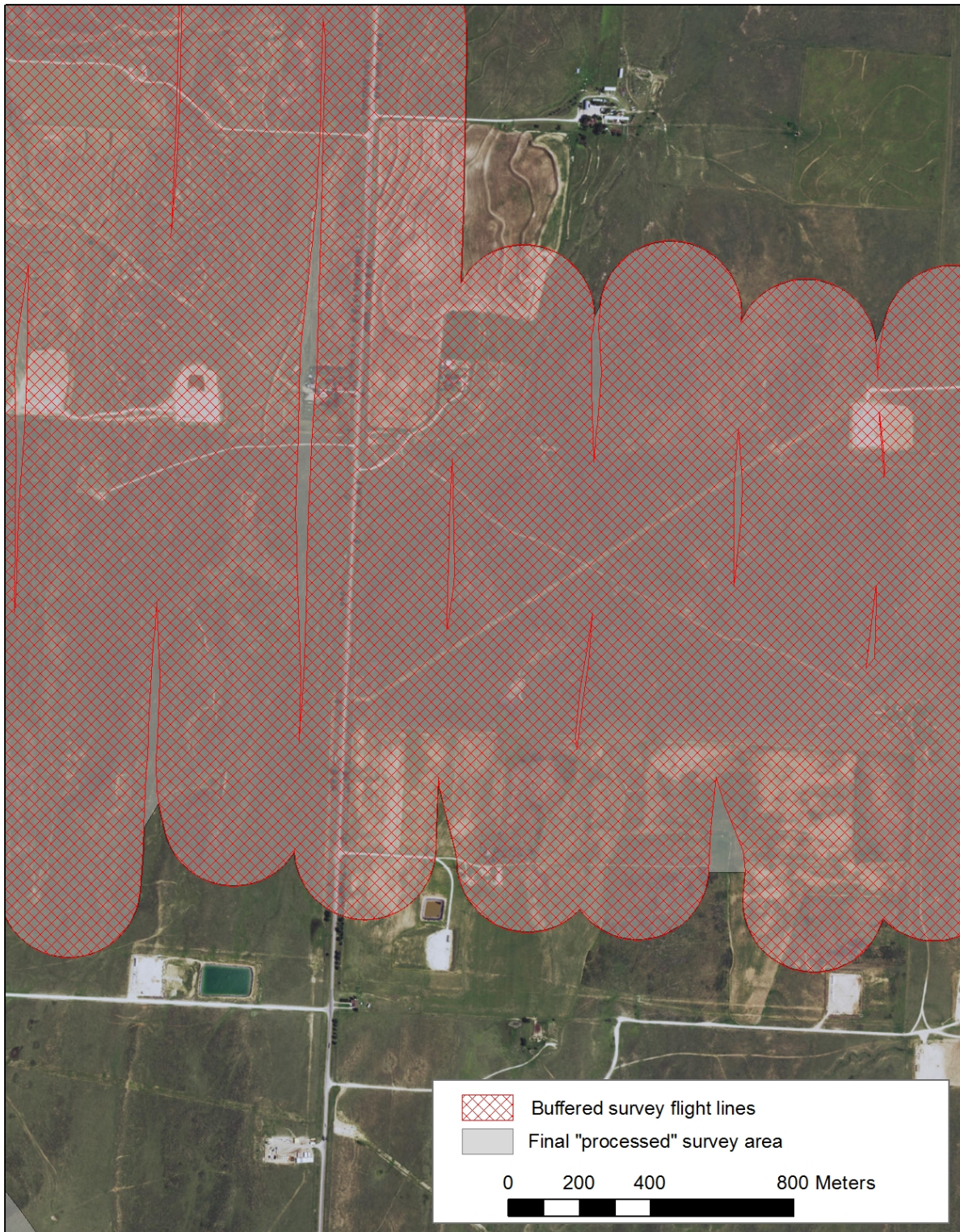


Figure 2. Buffered aerial surveys with the small “sliver” gaps identified in gray. These are considered surveyed.



Buffered flight lines with justified avoidance gap

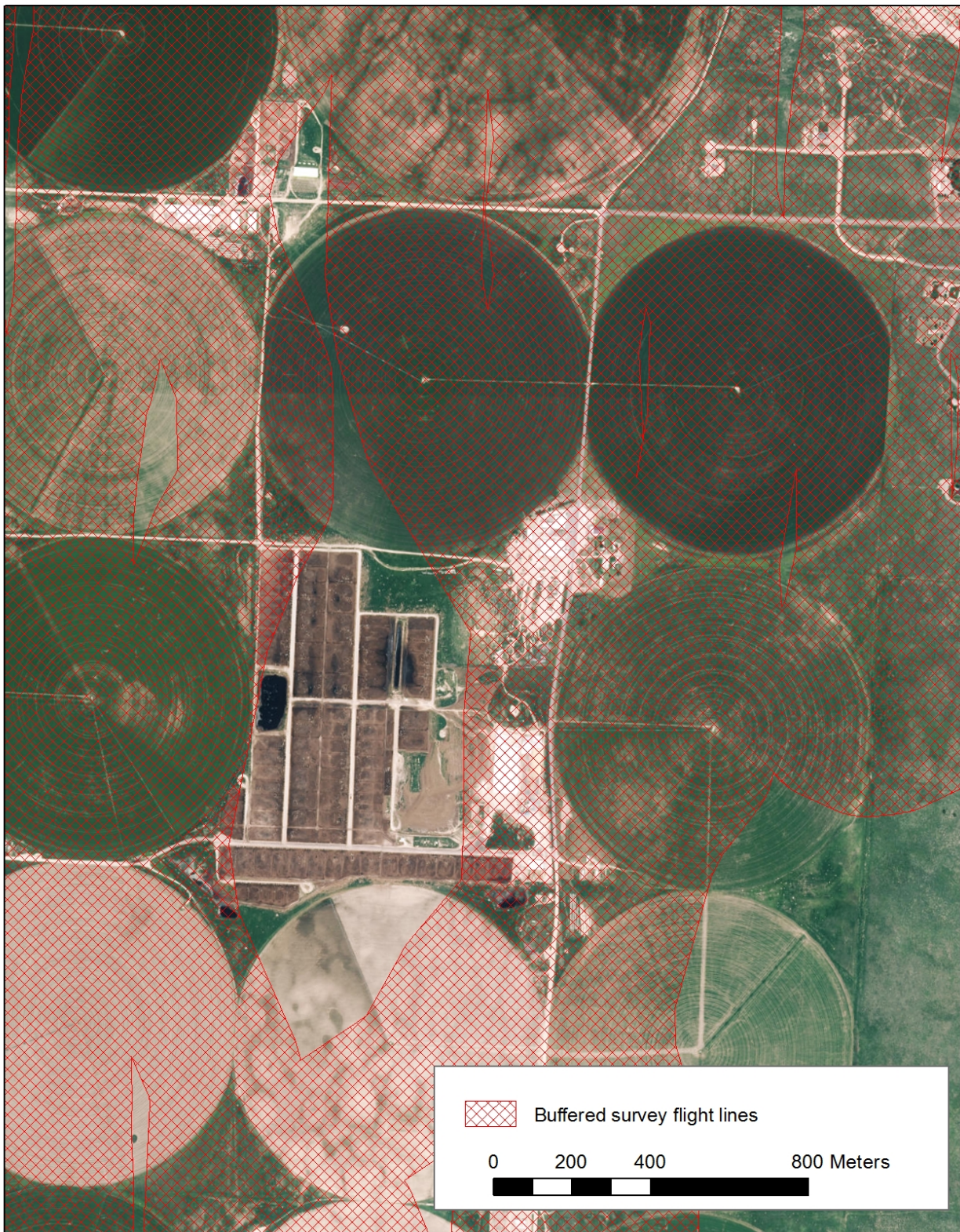


Figure 3. Buffered aerial surveys with both small sliver gaps and a large justified gap over a feed lot. All the gaps in this image would be considered surveyed.



Buffered flight lines with justified avoidance gap



Figure 4. Buffered aerial surveys with both small sliver gaps and a large un-justified gaps. The larger gaps here will not be considered as surveyed areas.



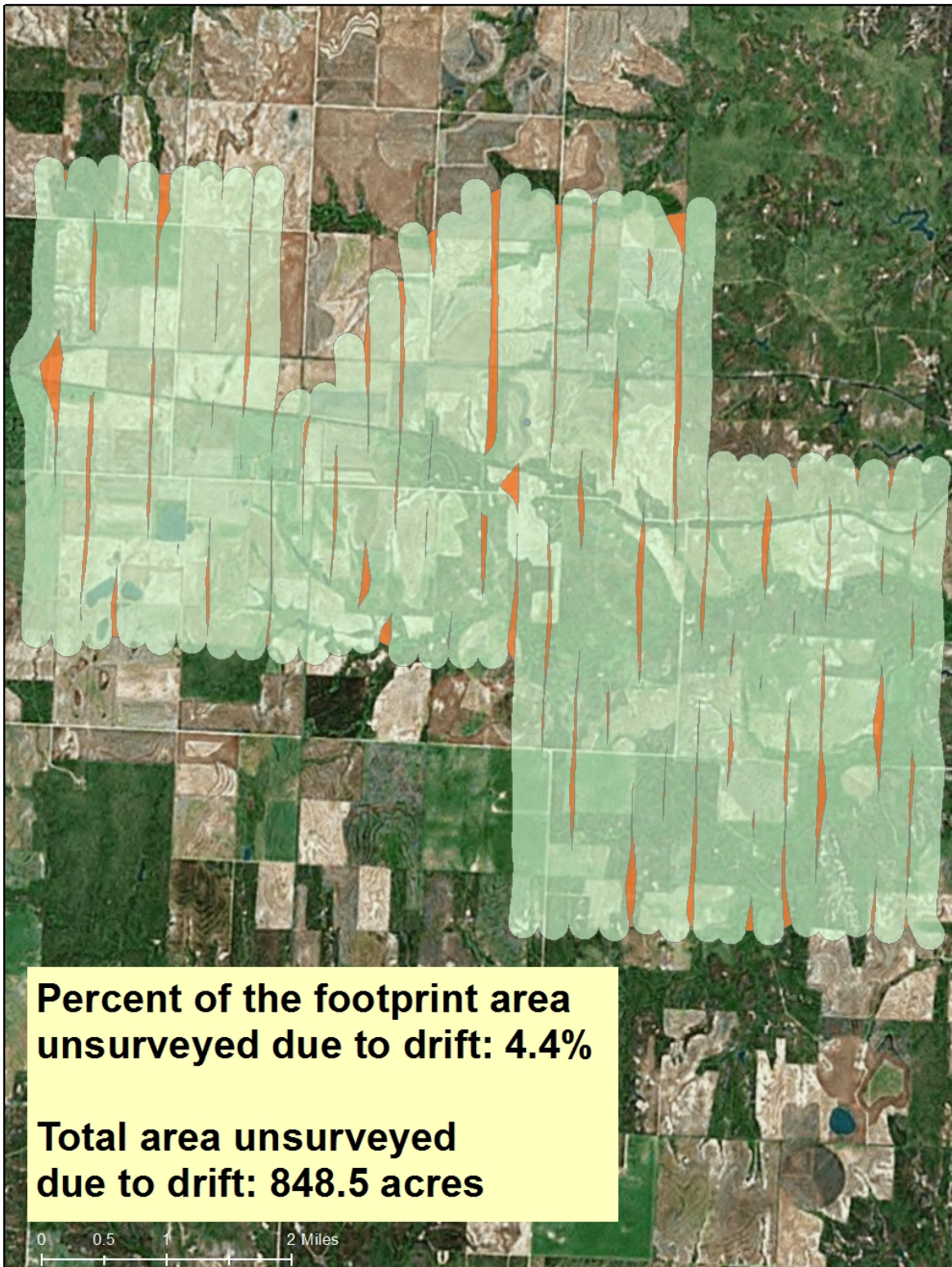


Figure 5. View of an entire survey block with the small sliver gaps filled in as surveyed and the larger unjustified gaps (orange) remaining as gaps in the survey coverage.