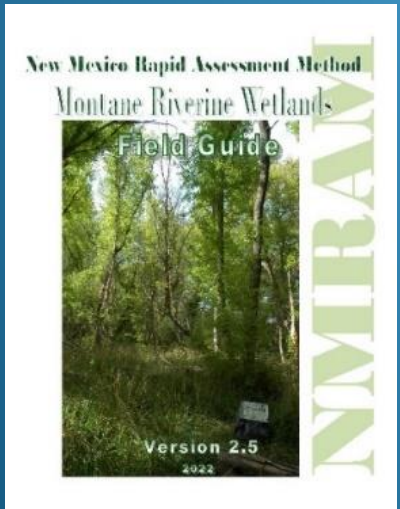
New Mexico Environment Department

New Mexico Rapid Assessment Method (NMRAM)

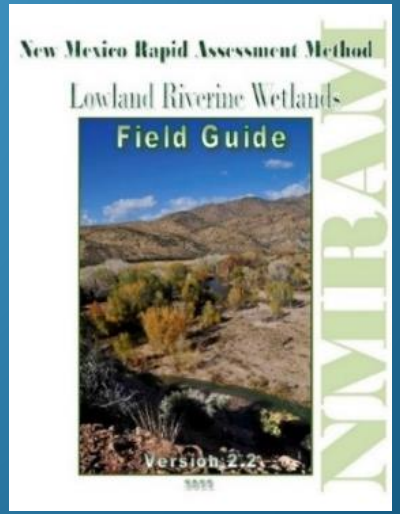
Riverine Wetlands

Landscape Metrics Intro *and* Buffer Integrity Index



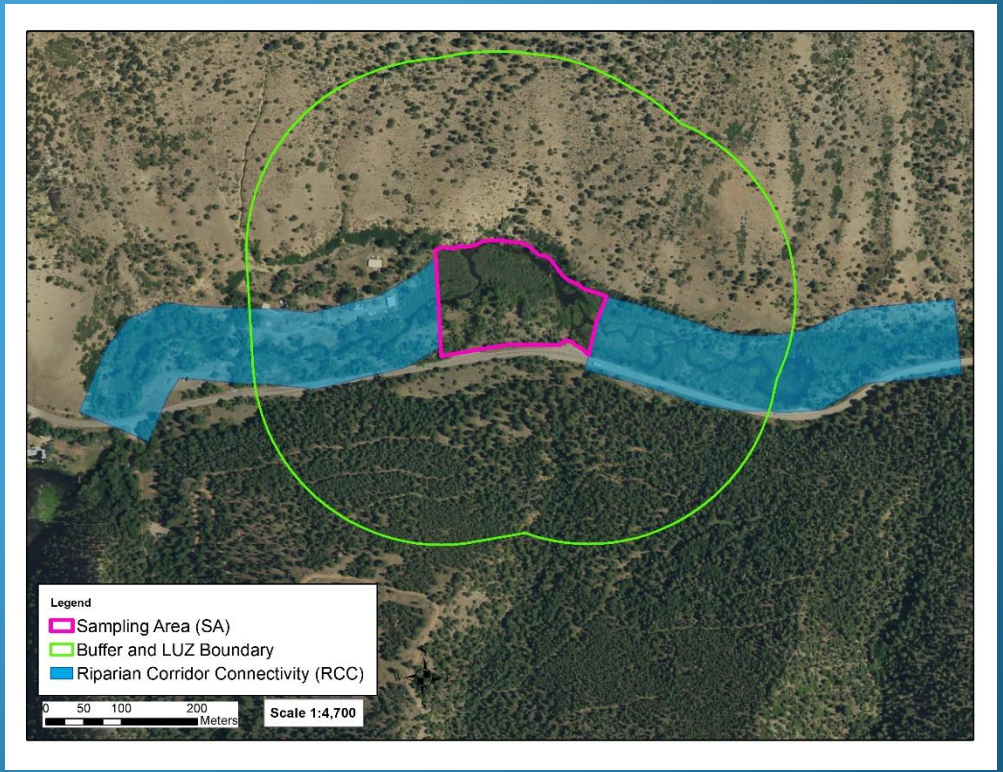
New Mexico Environment Department
Surface Water Quality Bureau
Wetlands Program

Natural Heritage New Mexico
University of New Mexico



NMRAM Riverine Landscape Context Metrics

1. Buffer Integrity Index
2. Riparian Corridor Connectivity
3. Relative Wetland Size
4. Surrounding Land Use

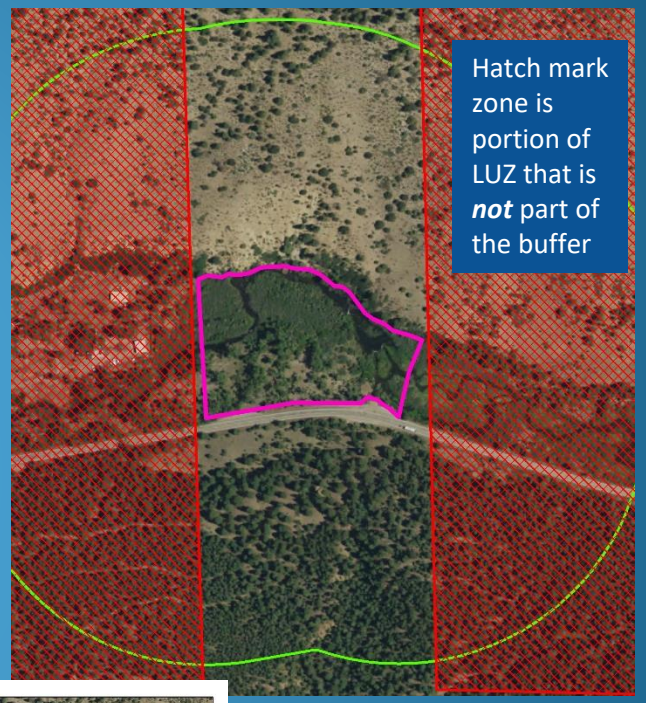


Buffer Integrity Index

- Presence and extent of natural and semi-natural buffer in the 250m buffer zone lateral to the SA
  - The buffer distance is the same regardless of SA size
- Level 1 and 2. GIS and ground-based

Comprised of 2 submetrics:

1. **Buffer Percent**
2. **Buffer Width**



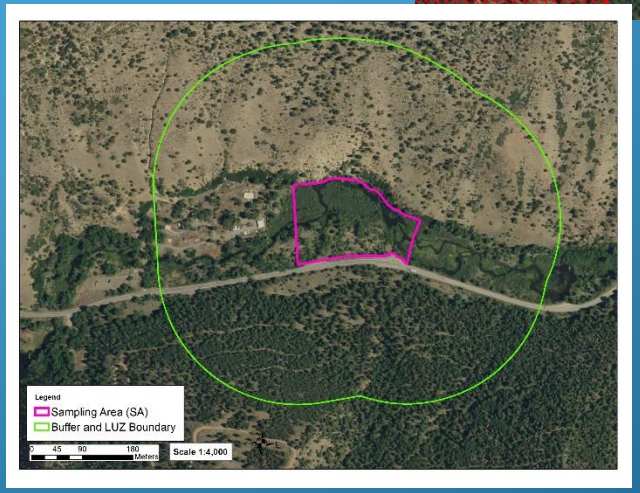
Natural buffers provide functions and services for the SA by:

reducing erosion and sedimentation

reducing nutrient loading

reducing pollutant contamination

providing habitat connectivity



Buffer Integrity Index

- List of Connectivity and Non-connectivity elements provided on Worksheet 1a (page 4 of datasheets) to determine presence and extent of buffer
  - Check off present allowed and excluded buffer features on Worksheet 1a

L1 - Buffer Integrity Index

Worksheet 1a. Buffer and RCC Checklist. Check off land cover elements within the buffer area or RCC corridors that are either allowed, or are excluded and considered non-buffer elements that disrupt ecosystem connectivity. Indicate the imagery type and date (season and year of imagery).

Imagery	NAIP (National Agriculture Imagery Program)	Image Date	2020

Allowed buffer/RCC land cover elements			Excluded non-buffer/RCC land cover elements		
Buffer	RCC		Buffer	RCC	
●	☒	Natural or semi-natural vegetation patches	☐	☒	Commercial/residential developments, parking lots, dams, bridges, revetments, and other structures
☐	☐	Small irrigation ditches without levees	☐	☒	Lawns, parks, golf courses, sports fields
☐	☐	Old fields, unmaintained	☐	☐	Railroads
☐	☐	Open range land	☐	☐	Maintained levees, sediment piles, construction materials, staging areas
●	☐	Foot trails, horse trails, unpaved bike trails (low intensity)	☐	☐	Intensive livestock areas, horse paddocks, feedlots
☐	☐	Non-channel open water	☐	☐	Intensive agriculture: maintained pastures, hay fields, row crops, orchards, and vineyards
☐	☐	Non-functioning abandoned vegetated levees, or naturally occurring levees	●	☒	Paved roads or developed second-order unpaved but graded roads
☐	☐	unpaved two tracks roads	☐	☐	Open water bounded by a levee or other manmade structure
☐	☐	Other	☐	☐	Other

Hatch mark zone is portion of LUZ that is ***not*** part of the buffer

Buffer Integrity Index

- ***Buffer percent***: the percentage of the lateral area surrounding a wetland SA that is considered natural or semi-natural buffer
  - Only assessed along SA lateral perimeter of the SA (top and bottom of example figure)
  - Buffer must be at least 10 m wide, from the SA edge to disturbance, to be considered present
  - 100% = both lateral sides of SA combined

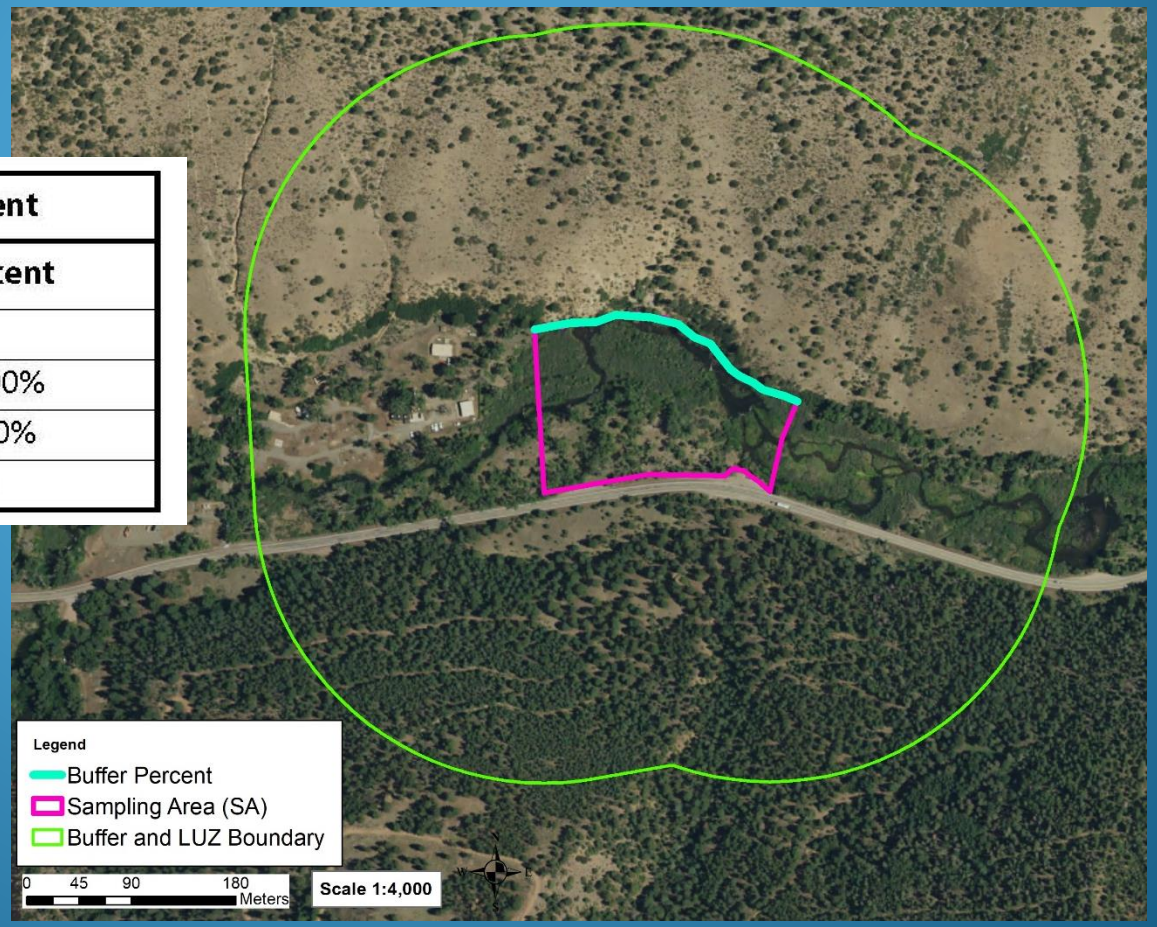
Table L1a. Buffer Percent	
Rating	**Buffer Percent**
4	100%
3	≥80% - <100%
2	≥50% - <80%
1	<50%

Buffer Integrity Index

Buffer percent:

The example SA has one lateral side with continuous buffer (north side of SA) and one lateral side with no buffer due to the paved highway adjacent to the SA. Thus for the example SA there is exactly 50% Buffer extent, which rates a "2".

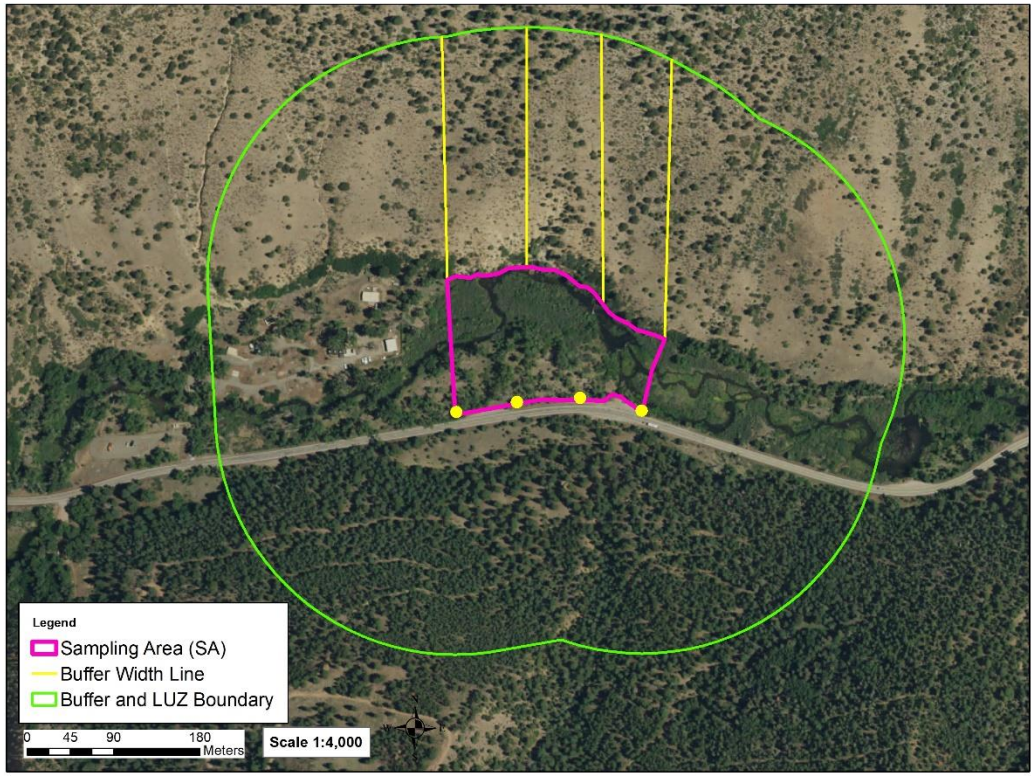
Table L1a. Buffer Percent	
Rating	**Buffer Percent**
4	100%
3	≥80% - <100%
2	≥50% - <80%
1	<50%



Buffer Integrity Index

- ***Buffer width***: the average width of the lateral area surrounding a wetland SA that is considered natural or semi-natural buffer
  - 8 lines, 4 on each side equally spaced
    - extending to first break in buffer or up to the 250 m maximum width
    - perpendicular to the AA lateral boundary
    - parallel to each other
  - Measure all 8 lines
    - Zero length for lines in areas without buffer
  - Rating based on average of the 8 lines

Table L1b. Buffer Width	
Rating	**Average buffer width**
4	≥190m
3	≥130 - <190m
2	≥65 - <130m
1	<65m

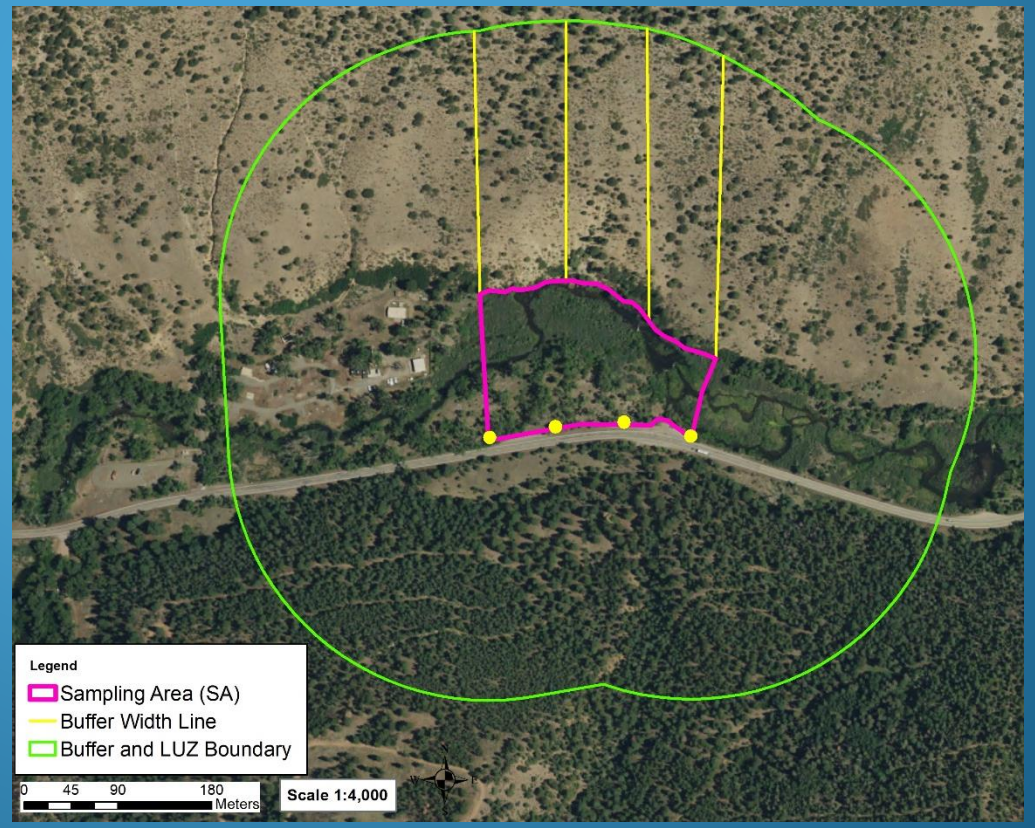


Buffer Integrity Index

Buffer width

The example SA has 4 buffer lines on the north side that extend without a break in buffer to the full 250 m maximum buffer length. On the south side of the example the road adjacent to the SA constitutes a break in buffer and results in 4 buffer lines of "0" length. The average width for the SA is 125 m, which rates a "2".

Table L1b. Buffer Width	
Rating	**Average buffer width**
4	≥190m
3	≥130 - <190m
2	≥65 - <130m
1	<65m



Buffer Integrity Index

Calculate the Buffer Integrity Index as a simple average of the buffer percent and buffer width sub-metrics

Worksheet 1b. Buffer Percent Sub-metric. Measure or estimate the percentage of the SA perimeter composed of allowed buffer elements and enter into the Buffer Percent Box below. Rate the sub-metric using Table L1a and enter the rating on the Buffer Integrity Summary Worksheet 1d.

Buffer Percent (%)=	50

Worksheet 1c. Buffer Width Sub-metric. Measure the length of each buffer line in meters in the GIS or on the map. Average the line lengths and rate using Table L1b. Enter the rating on the Buffer Integrity Summary Worksheet 1d.

Line	Buffer Width (m)	Buffer Width (ft)	Line	Buffer Width (m)	Buffer Width (ft)
A	250	820.2	E	0	0
B	250	820.2	F	0	0
C	250	820.2	G	0	0
D	250	820.2	H	0	0
Average		125 (m)		410.1 (ft)	

Worksheet 1d. Buffer Integrity Summary. Enter the sub-metric Ratings from Tables L1a and L1b above to calculate the Buffer Integrity Index Score using the formula in the box below. Using the Buffer Integrity Index Score, enter rating for Buffer Integrity in Table L1c and on the SA Summary Worksheet.

Buffer % Rating	+	Buffer Width Rating	/2 =	Buffer Integrity Index Score
2	+	2	/2 =	2

Table L1a. Buffer Percent

Rating	Buffer Percent
○ 4	100%
○ 3	≥80% - <100%
◉ 2	≥50% - <80%
○ 1	<50%

Table L1b. Buffer Width

Rating	Average buffer width
○ 4	≥190m
○ 3	≥130 - <190m
◉ 2	≥65 - <130m
○ 1	<65m

Table L1c. Summary Rating for Buffer Integrity

Rating	Score
○ 4	>3.5
○ 3	>2.5 - ≤3.5
◉ 2	>1.5 - ≤2.5
○ 1	≤1.5