

LAYERING: A “NEW” MODE OF SPREAD IN *ARUNDO DONAX*

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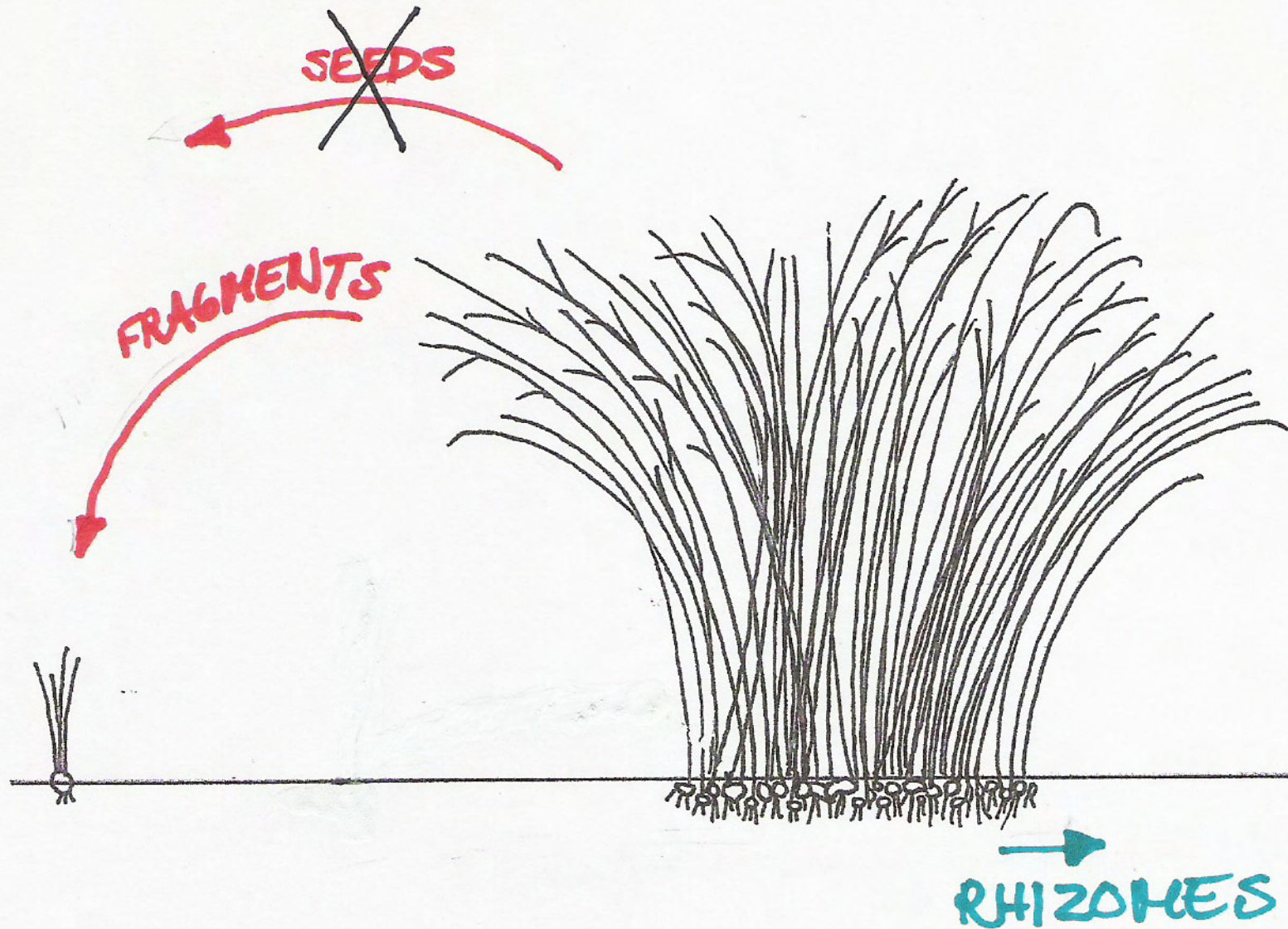
GIANT REED -- *Arundo donax*



Arundo lit.: “spreads quickly once established”
Boland 2003: “How?”



CONVENTIONAL WISDOM







BOTANICAL LITERATURE

A LAYER IS:

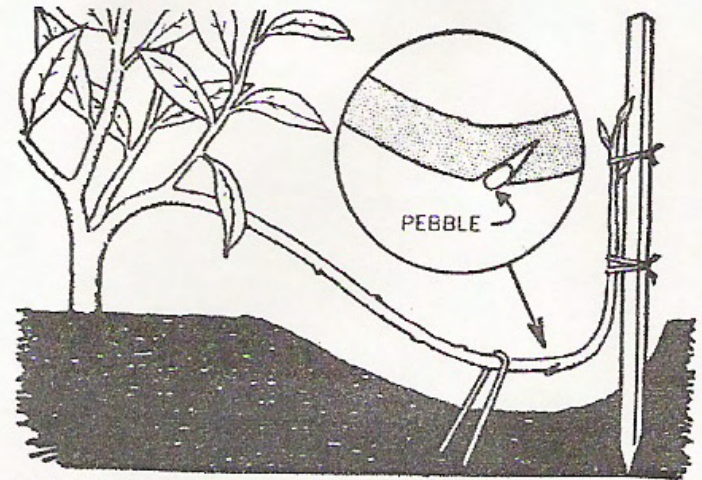
“A NORMAL
SHOOT THAT
ROOTS
ADVENTITIOUSLY
WHEN IN
CONTACT WITH
THE SOIL”



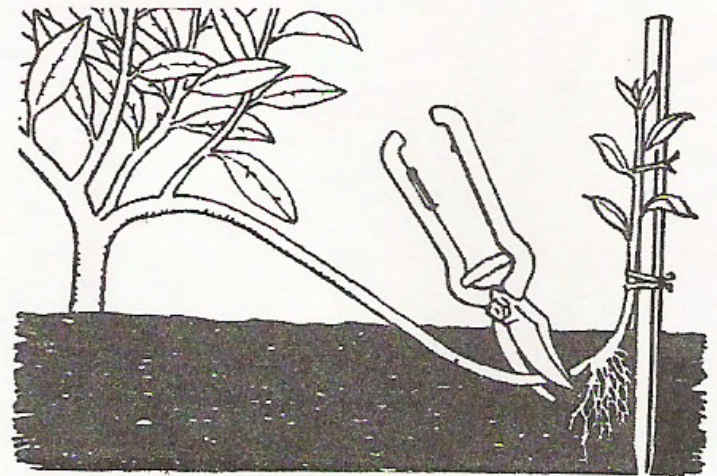
WESTERN GARDEN BOOK

PROPAGATING TECHNIQUES

Ground Layering



Pebble keeps notch open; roots are more likely to form near wound.



Sever rooted layer carefully; roots are tender, easily torn.

Arundo Literature

- Almost nothing about layers & layering
- O in Bell (1993, 1997), Else (1996), DiTomaso (1998), Hoshovsky (2003)
- Review paper by Dudley (2000) says it happens: “*root formation does occur where an attached culm has fallen over and is in contact with substrate*” but that’s all

HOW COMMON?

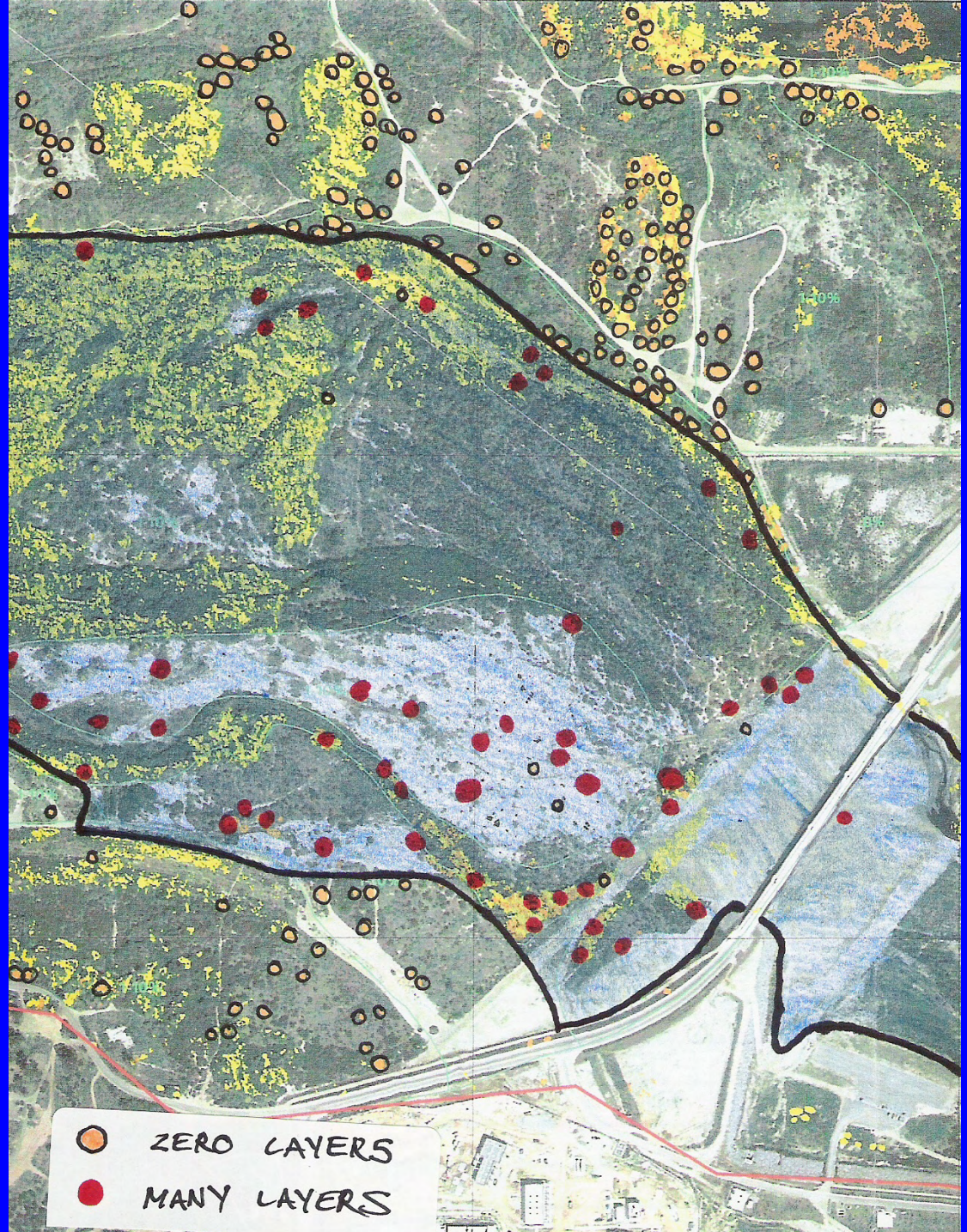
(Aug 2005)

INSIDE FLOOD ZONE (n = 100):

79% of clumps had >4 new layers

OUTSIDE FLOOD ZONE (n = 100):

0%



2005 – 80 new layers (0.5 yr old) at
my 19 monitored clumps



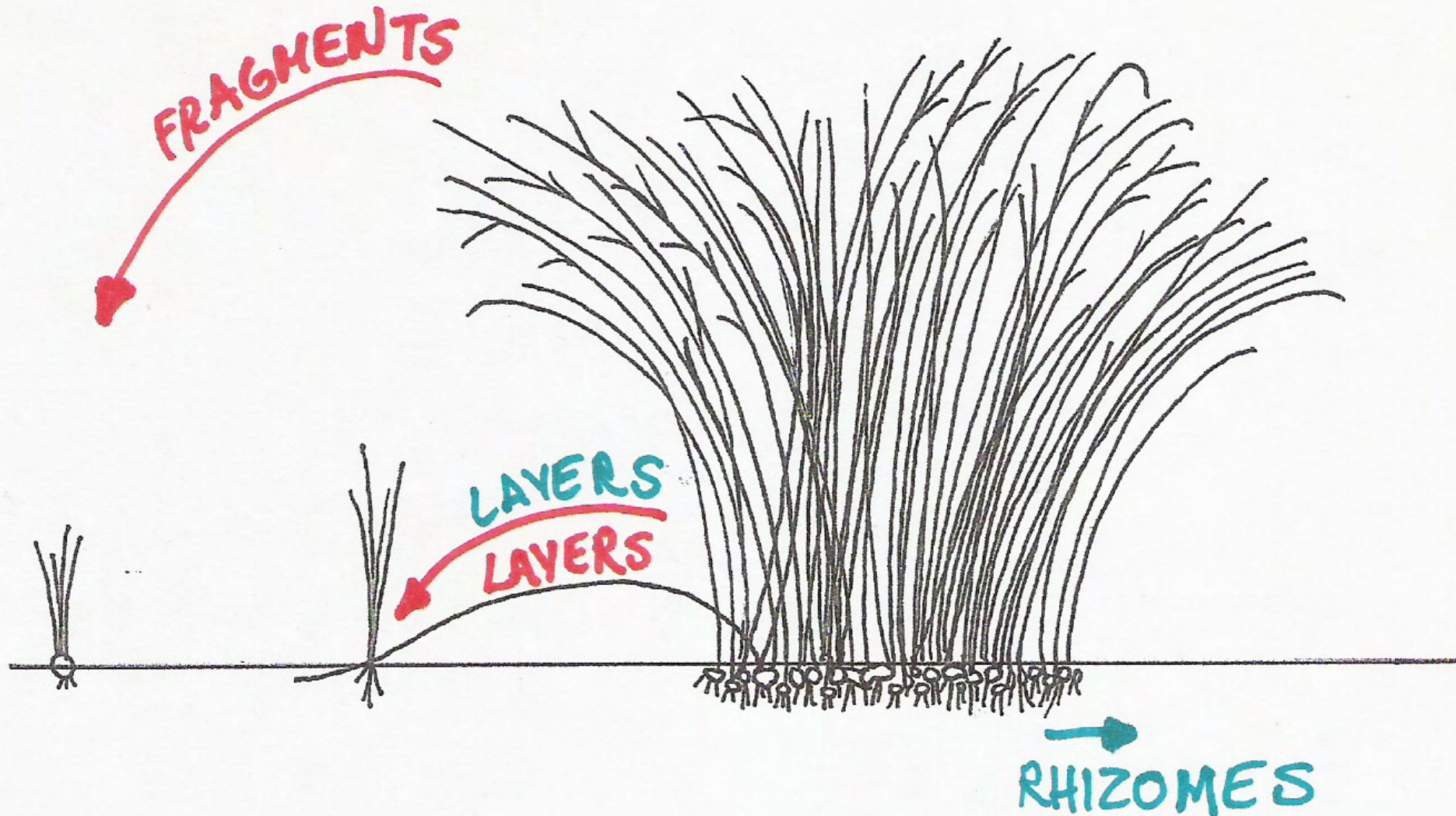
2006 – How do 1.5 year-old layers look?
-- 85% survivorship of layers







NEW VIEW OF SPREAD IN ARUNDO (QUALITATIVE)



QUANTIFY?

RHIZOMES v. LAYERS

FRAGMENTS v. LAYERS

RHIZOMES

2003: STARTED MONITORING EXPANSION
OF 19 CLUMPS



14E in 2003



14E in 2004



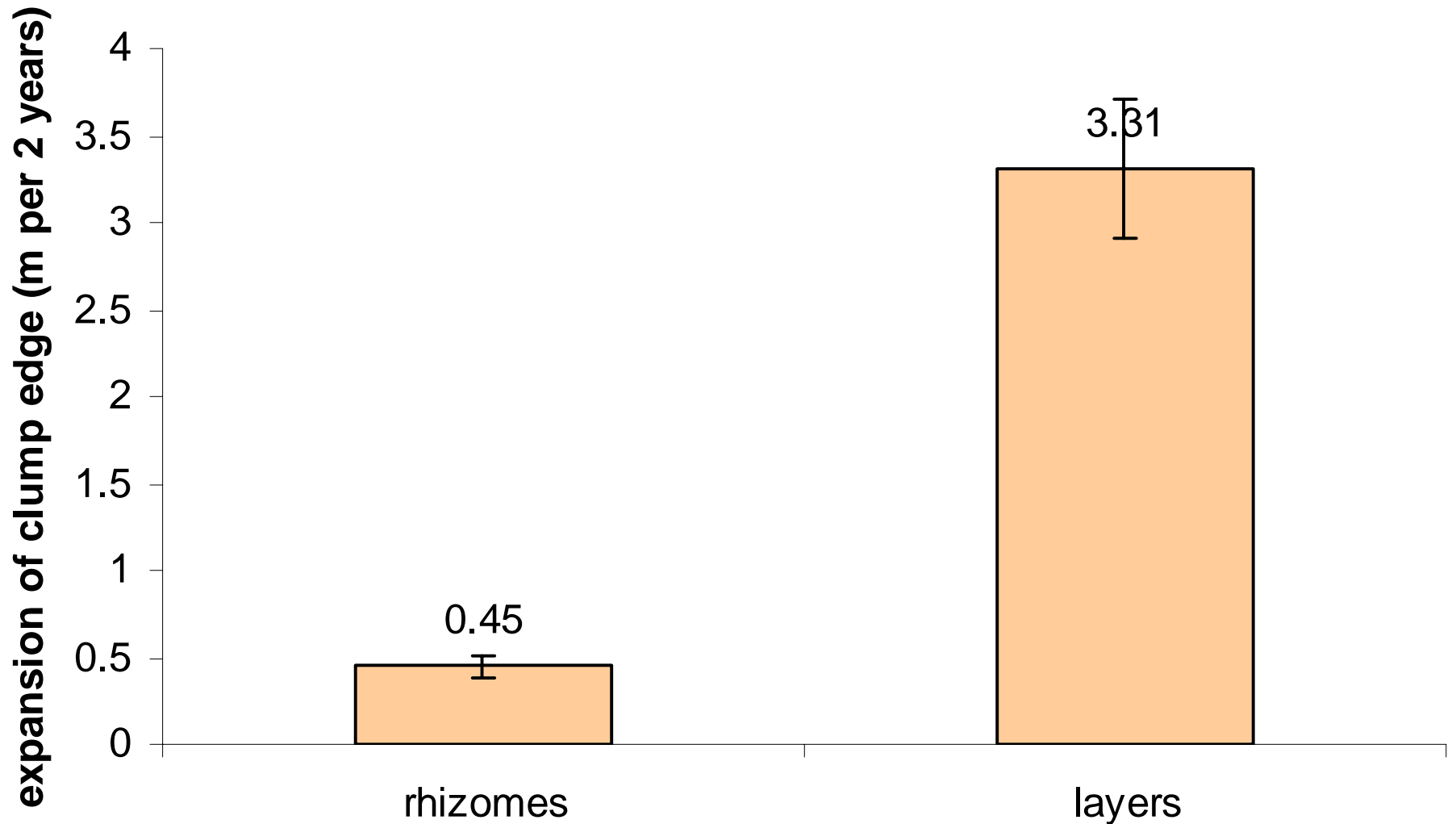
14E in 2005



LAYERS – at edge of *Arundo* canopy > 3 m



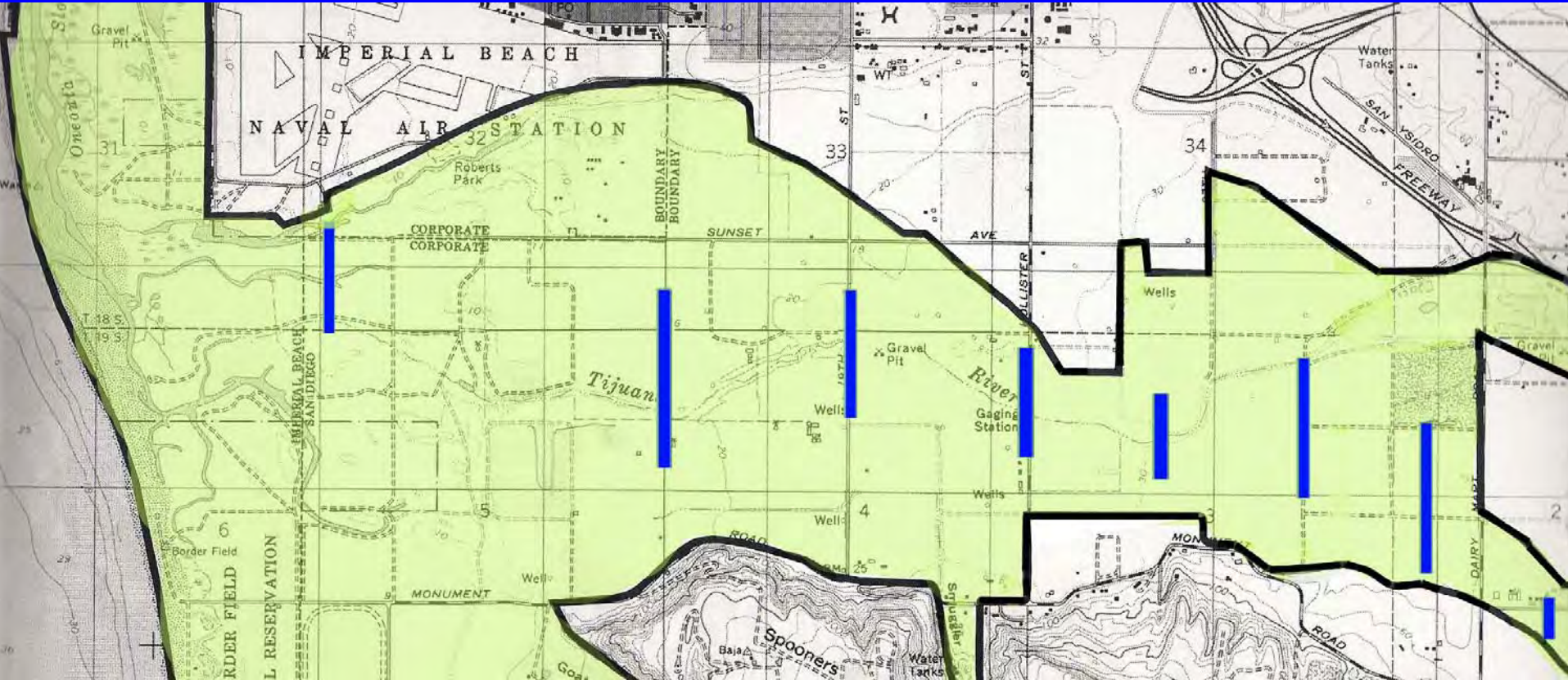
EXPANSION: RHIZOMES v. LAYERS



REPRODUCTION: FRAGMENTS v. LAYERS



SEARCH FOR NEW RECRUITS FROM FRAGMENTS AND LAYERS (8 BELT TRANSECTS – JUNE 2005)



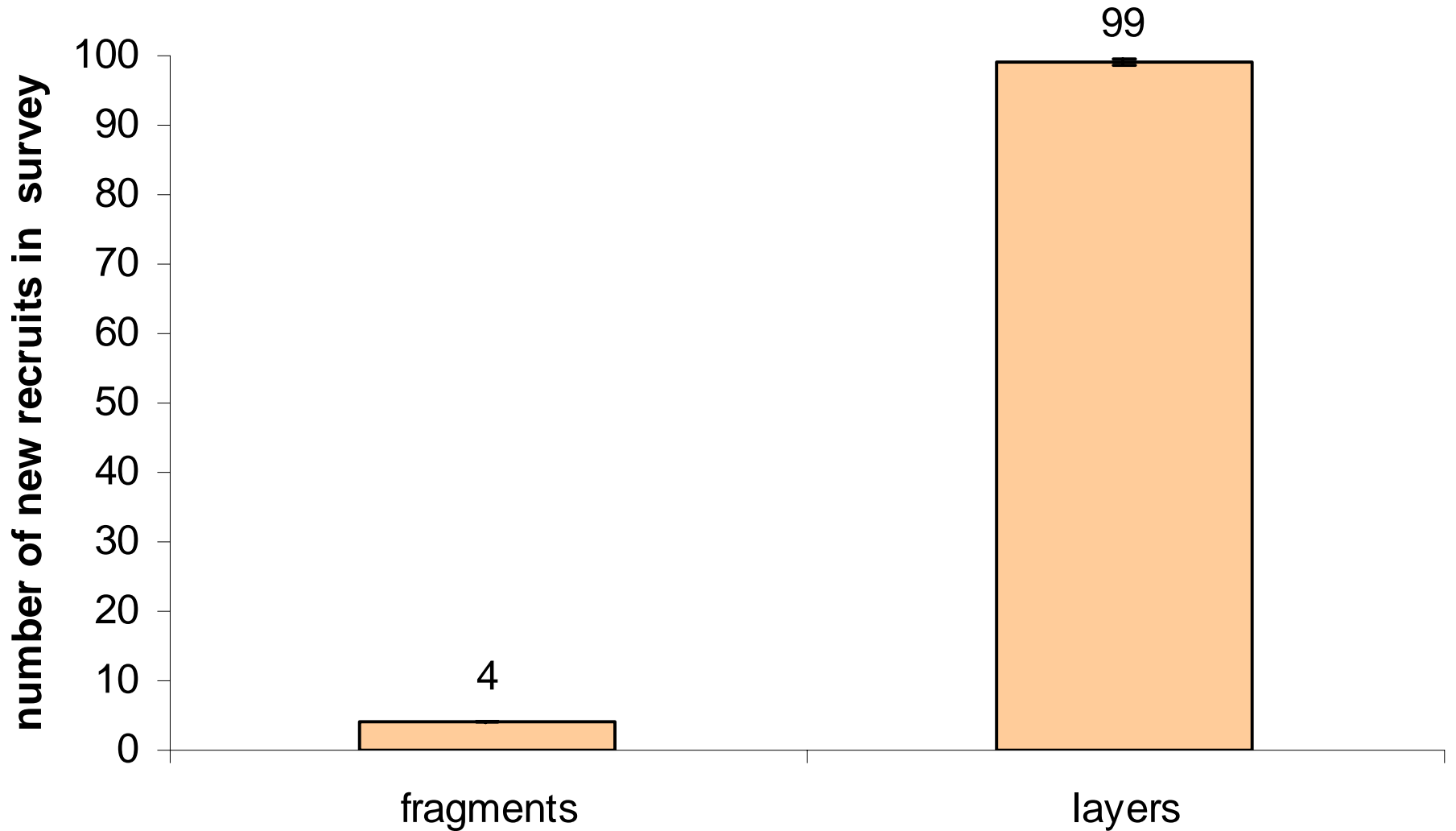






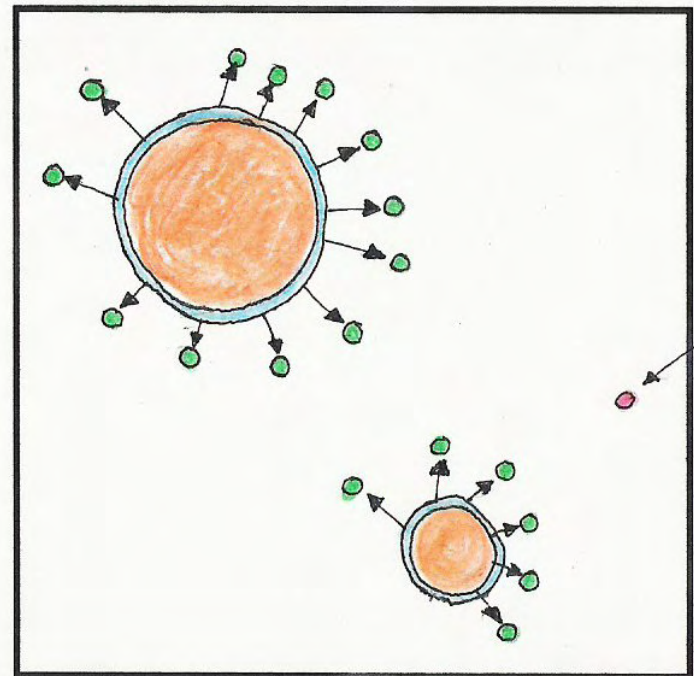
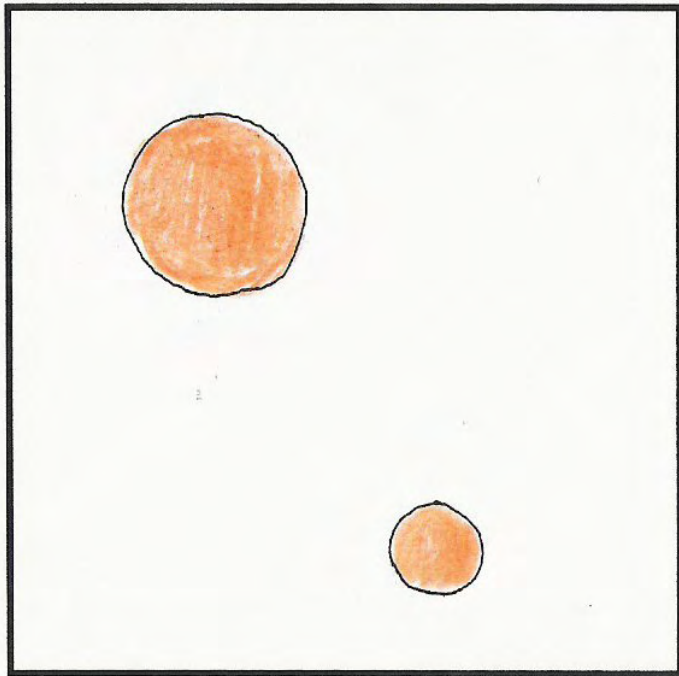
REPRODUCTION: FRAGMENTS v. LAYERS

(8,374 m² survey)



OBSERVED IN TIJUANA RIVER VALLEY FLOOD ZONE

1,500 m²



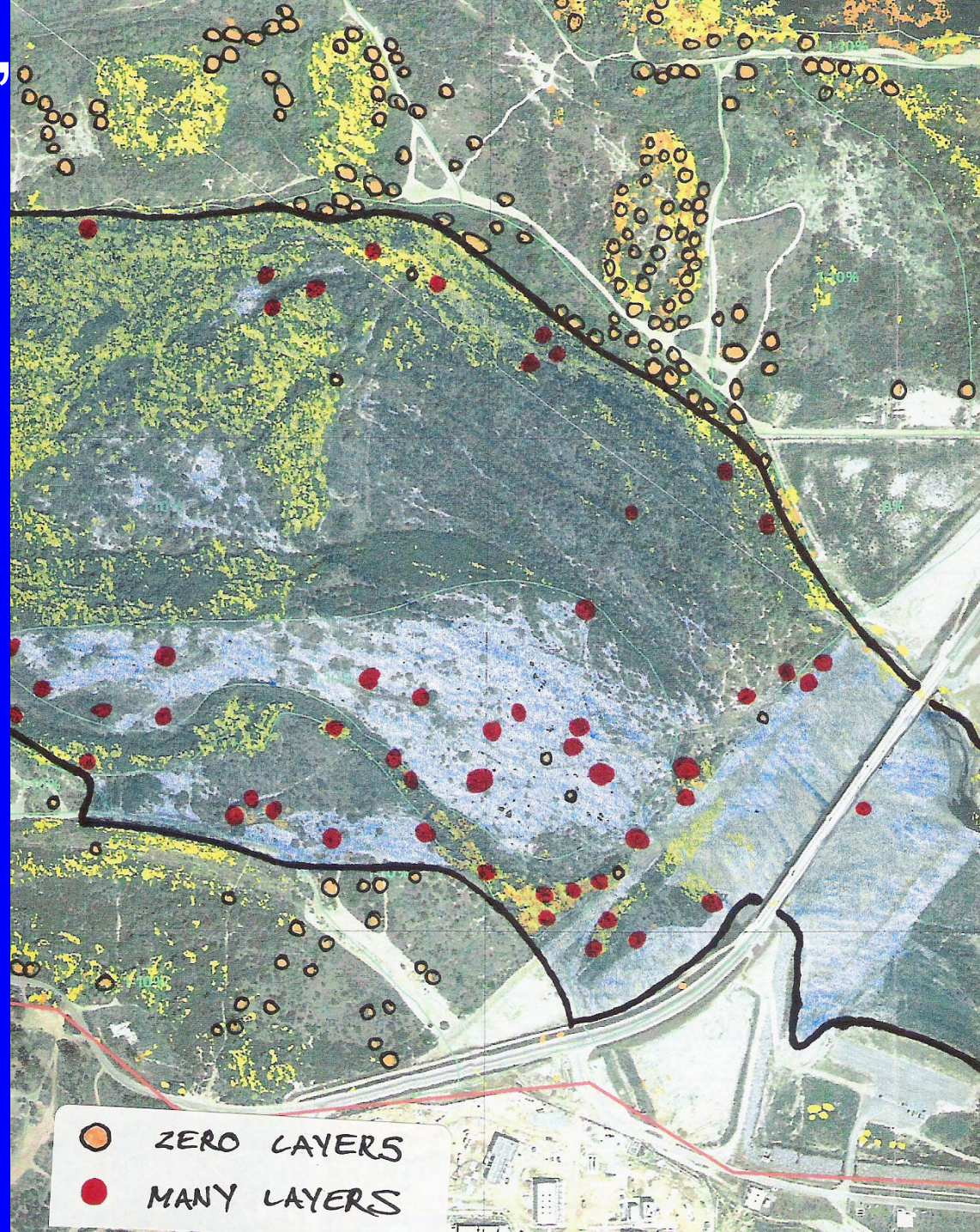
SO WHAT?

“TOP-DOWN” CONTROL STRATEGY SHOULD BE RECONSIDERED

- Assumes:
 - new clumps from fragments only
 - fragments are common
- Counter-productive if:
 - layers > fragments

“INSIDE – OUT”

- SHOULD TARGET FASTEST SPREADING PLANTS (Moody and Mack 1988)
- FASTEST-SPREADING ARUNDO ARE IN THE FLOOD ZONE (slowest are outside)



SUMMARY

- Layers – 0.5 year and 1.5 year-old
- Layering was common in the flood zone
- Layering is an important mode of spread
 - Expansion of clumps: Layers > rhizomes
 - Reproduction: Layers >> fragments
- Current control strategy (“Top-down”) needs to be reconsidered
- An “Inside-out” strategy is likely to be more effective

