

Levee Inspection Program & Status Update of the East Coast Protective Levee

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Historical Perspective

- SFWMD has always performed bi-annual Inspections of State and Federal levees as part of the Central & Southern Flood Control Project
- Hurricanes Katrina and Rita (2005) hit the Gulf Coast and changed the way that the USACE viewed levees
- National Levee Safety Act passed in 2007 directed the USACE to inventory and inspect existing Federal levees
- SFWMD submits annual inspections of the levees to the USACE (979 miles) as identified in the National Levee Database
- SFWMD performs 5-year inspections of a more rigorous nature

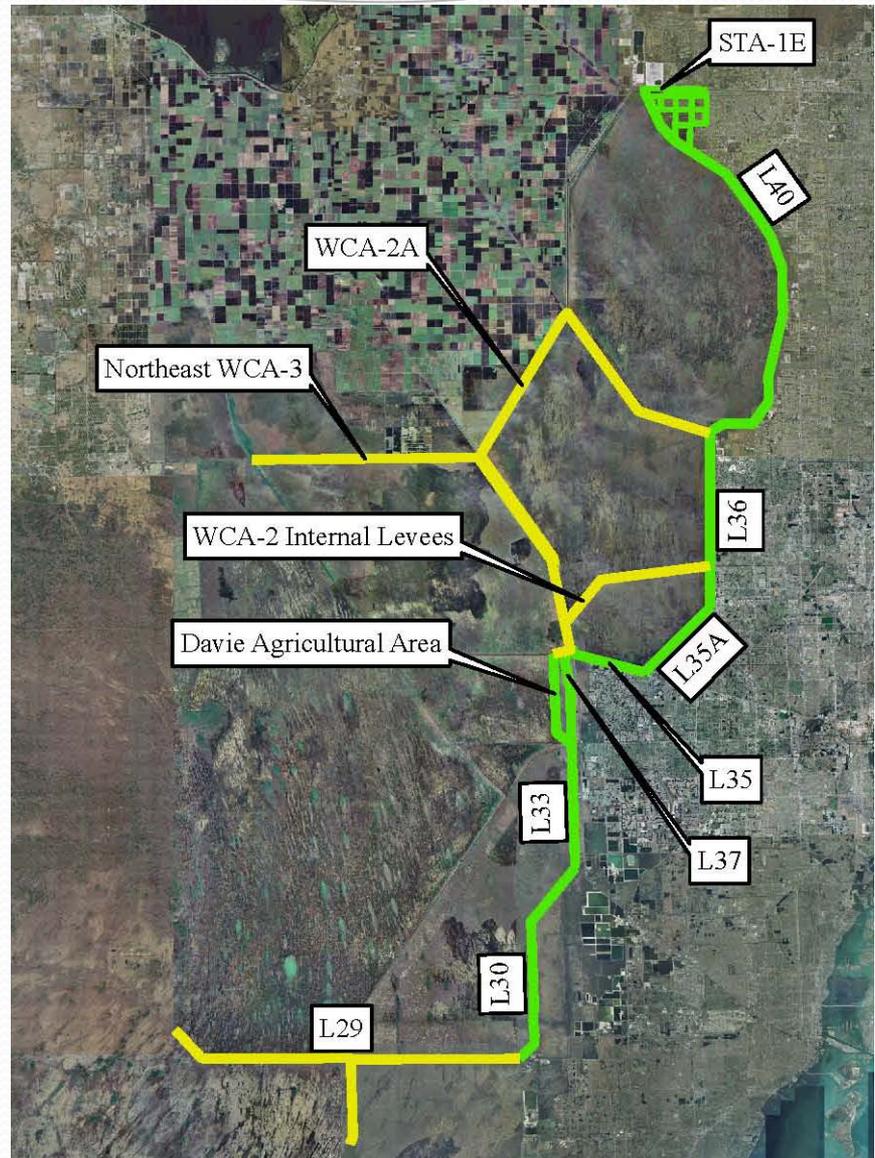
Rehabilitation & Inspection Program

- Must meet USACE criteria and continue to meet ongoing criteria for continued eligibility
- Only Active projects may receive PL 84-99 rehabilitation assistance to repair damage caused by a flood event or coastal storm
- USACE Maintenance Inspection Rating System
 - Acceptable/Marginally Acceptable Rating = Active Status
 - Unacceptable Rating = Inactive Status
- After repairs are made, action taken to reactivate status
- Only 2 levees in the nation received Acceptable rating
- USACE inspections are not related to flood insurance policies or rates.

Rehabilitation & Inspection Program

- Received 14 Periodic Inspection Reports from USACE
- Maintenance report card not based on risk
- Inspection program is based on visual assessments of levee conditions on maintenance related issues such as:
 - culvert conditions, encroaching objects (billboards, utility poles), vegetation (trees, shrubs), animal burrows, slope stability, and seepage.
- Some structures in system are federal and local
- Deficiencies will be handled through:
 - Field Station Maintenance or
 - Prioritized in the O&M Capital Plan

Periodic Inspection Reports



Periodic Inspection Reports

Levee System	Overall Maintenance Rating	County	Responsibility
L63N	M	Okeechobee	SFWMD
STA-1E	M	Palm Beach	USACE
L40	M	Palm Beach	SFWMD
L35A, L36	M	Broward	SFWMD
L35, L37	M	Broward	SFWMD
L33	M	Broward/Miami-Dade	SFWMD
L30	M	Miami-Dade	SFWMD
L29	U	Miami-Dade	SFWMD
WCA-2A	U	Palm Beach/Broward	SFWMD
NE WCA-3	U	Palm Beach/Broward	SFWMD
WCA-2 Internal	U	Broward	SFWMD
Davie Ag Area	M	Broward	SFWMD

ECPL

ECPL

Palm Beach County

- First inspection report for L40 received in 2009
- Corrective measures included:
 - Vegetation clearing and herbicide treatment
 - Earthwork repairs
 - Select structural repairs
 - Removal of encroachments
- Additional items requiring attention
 - Structure repairs
 - Encroachment removals

Maintenance Repairs

G94A Before



G94A After



Before



After



Encroachments Removed

Before



After



**LWDD Removed
Articulated Block**

Before



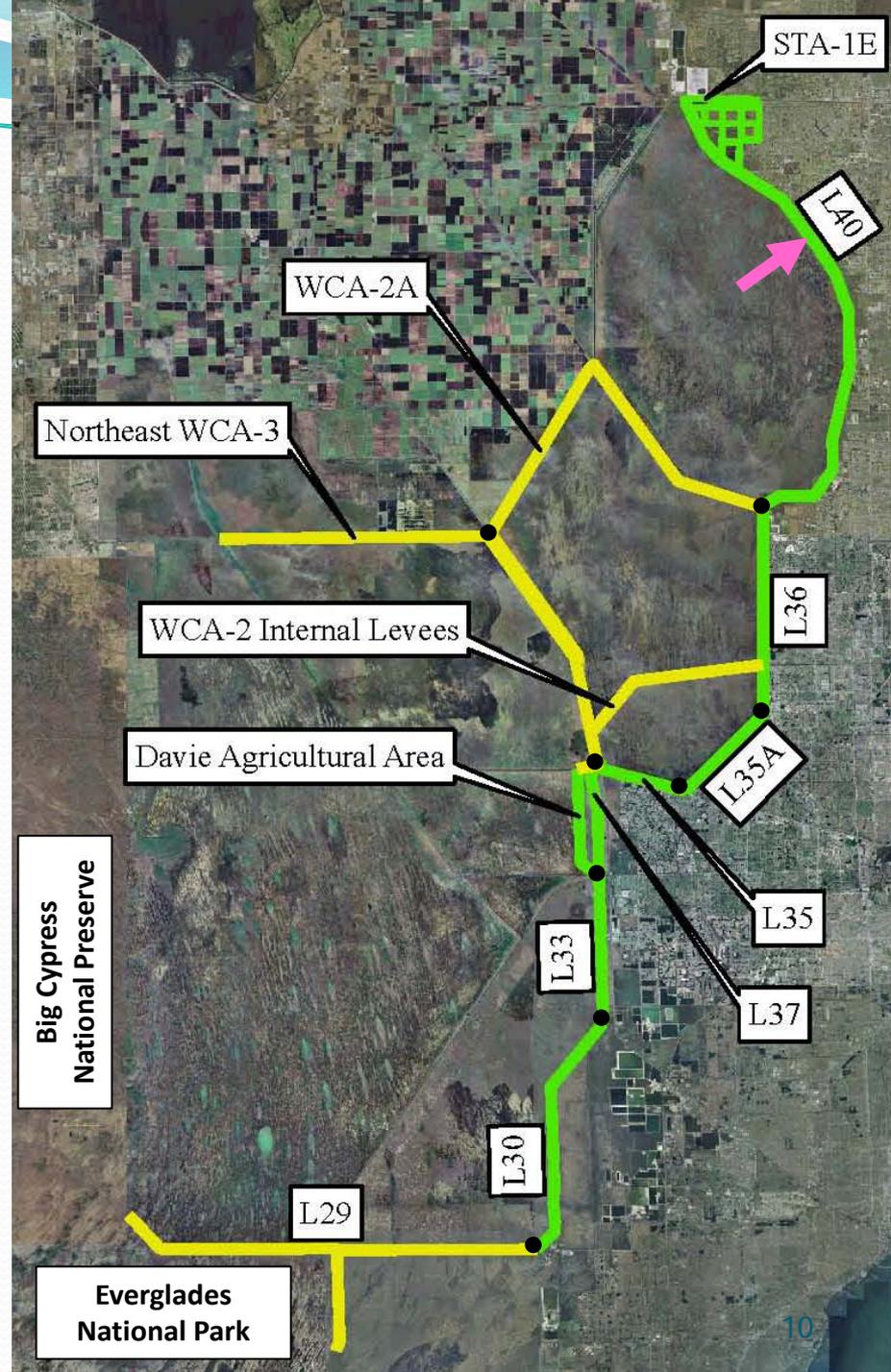
After



**Unused Power
Poles Removed**

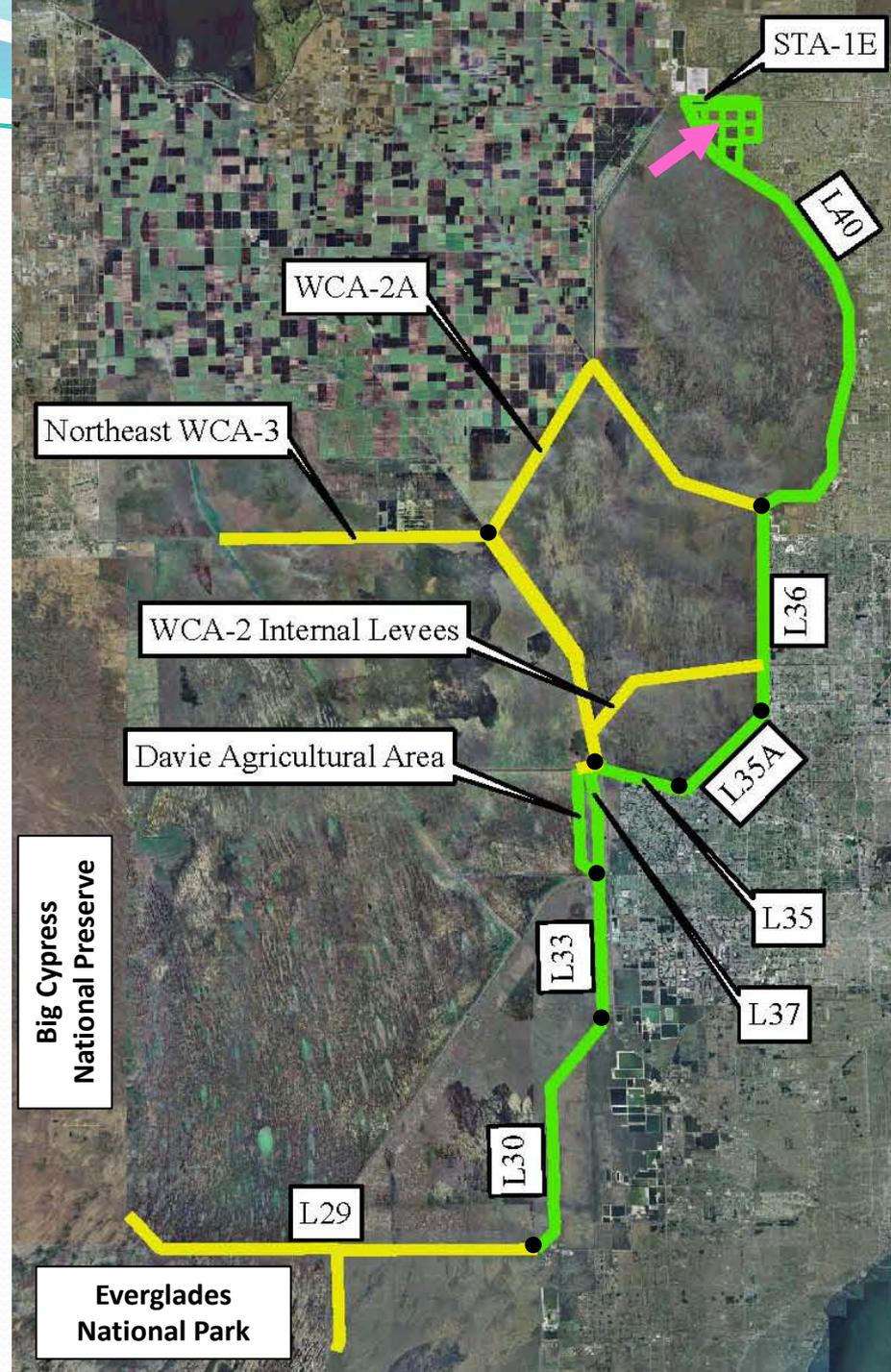
L40 - ECPL

- Remove unwanted vegetation ✓
- Minor repairs to G94A-D Culverts – U
- Remove USFWS and ACME encroachments



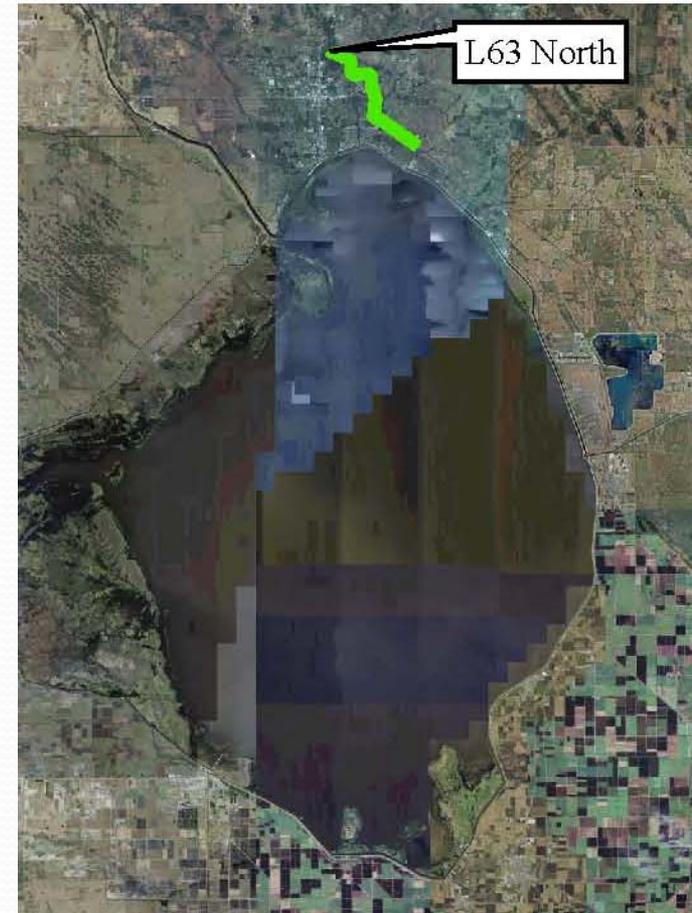
STA1E

- Remove unwanted vegetation
- Missing sod cover
- Erosion and bank caving
- Depressions and rutting
- S-375 decommissioned and under contract for repair



L63N – Okeechobee

- Remove unwanted vegetation ✓
- Remove exposed HDPE culvert pipes, provide end treatments and erosion protection measures
- Repair damaged flared end sections at pipe inlets
- Repair damaged and eroded areas in canal side slopes, many areas less than design slope (3H:1V)
- Improve measures to keep animals from damaging levee embankment (83 burrows observed)



Broward County

- Ongoing FEMA Certification in Process
- Maintenance activities completed are:
 - Wave action repair
 - Addition of fill to raise levee elevation to design
 - Undesirable vegetation removal
 - Herbicide treatment
 - Monitoring stations installed
 - Installation of temporary seepage measures – ring dikes
- Construction of Downstream Seepage Berm along Levee Alignments in FY12 - 13

Maintenance Repairs



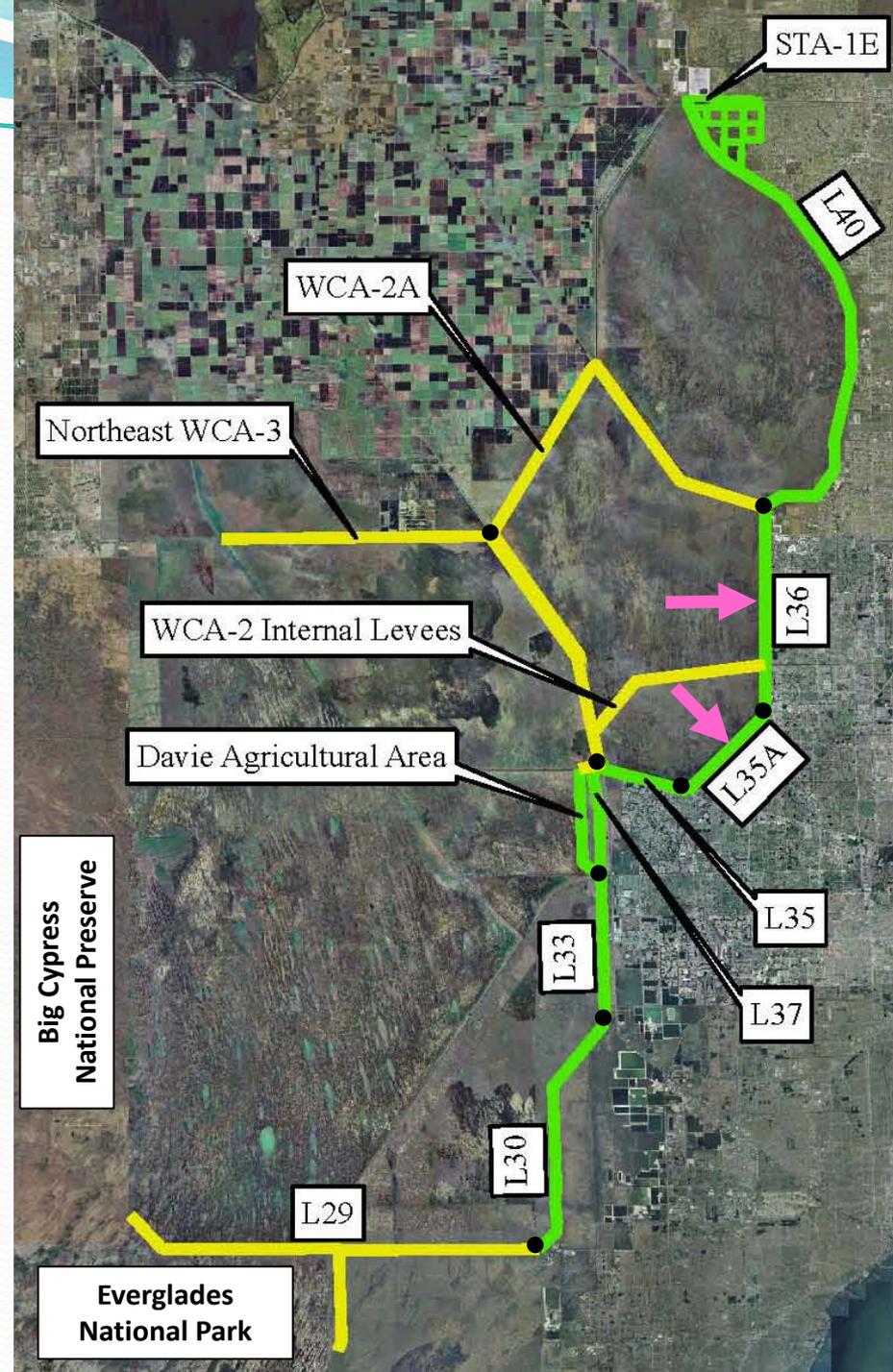
BEFORE



AFTER

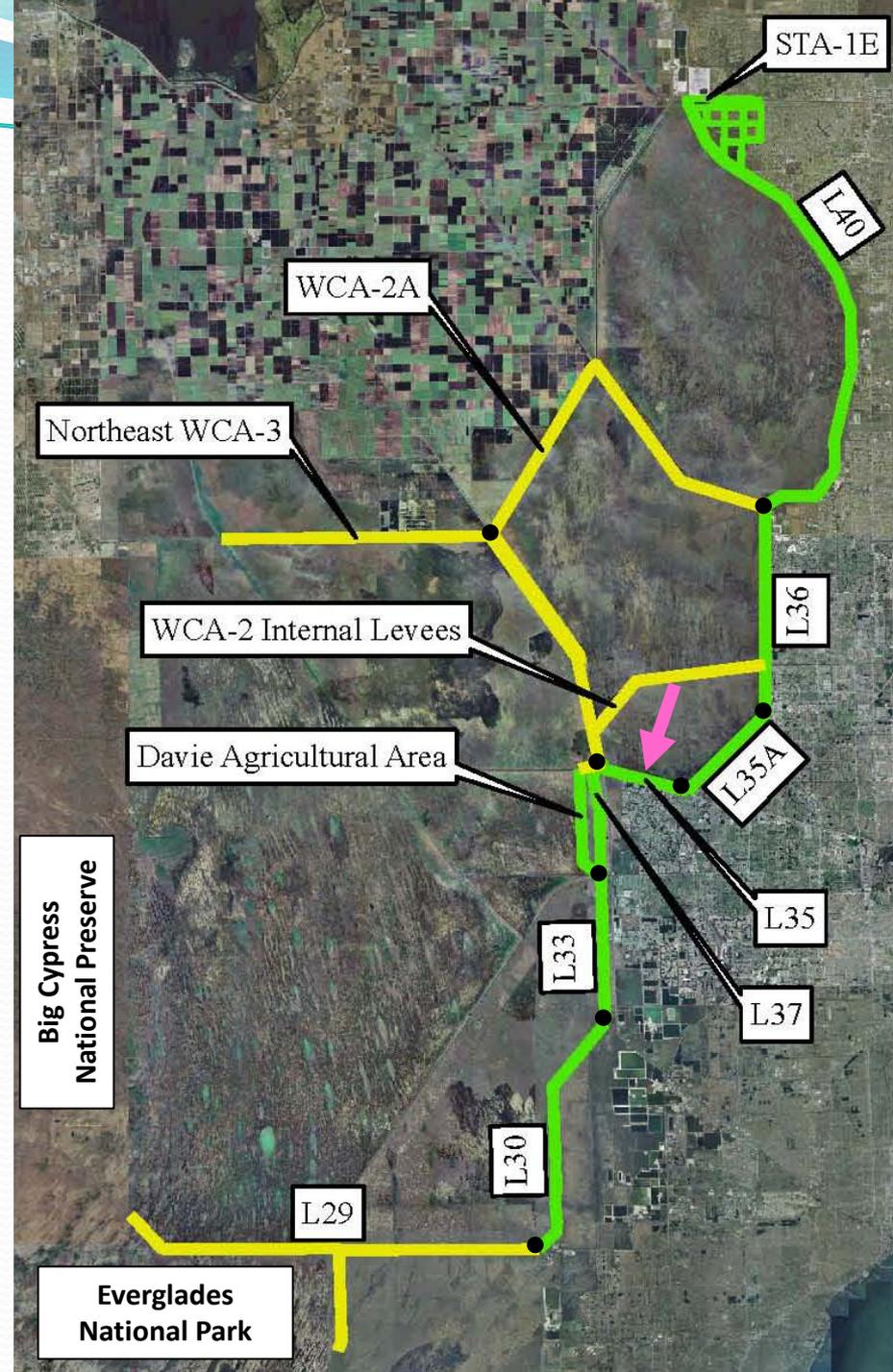
L36 & L35A - ECPL

- Remove unwanted vegetation – U ✓
- Remove/obtain acceptance for encroachments
- Repair erosion, regrade depressions and evaluate settlement ✓
- Remove/relocate burrowing animals (15 burrows)
- Clean, repair and repaint corroded surfaces



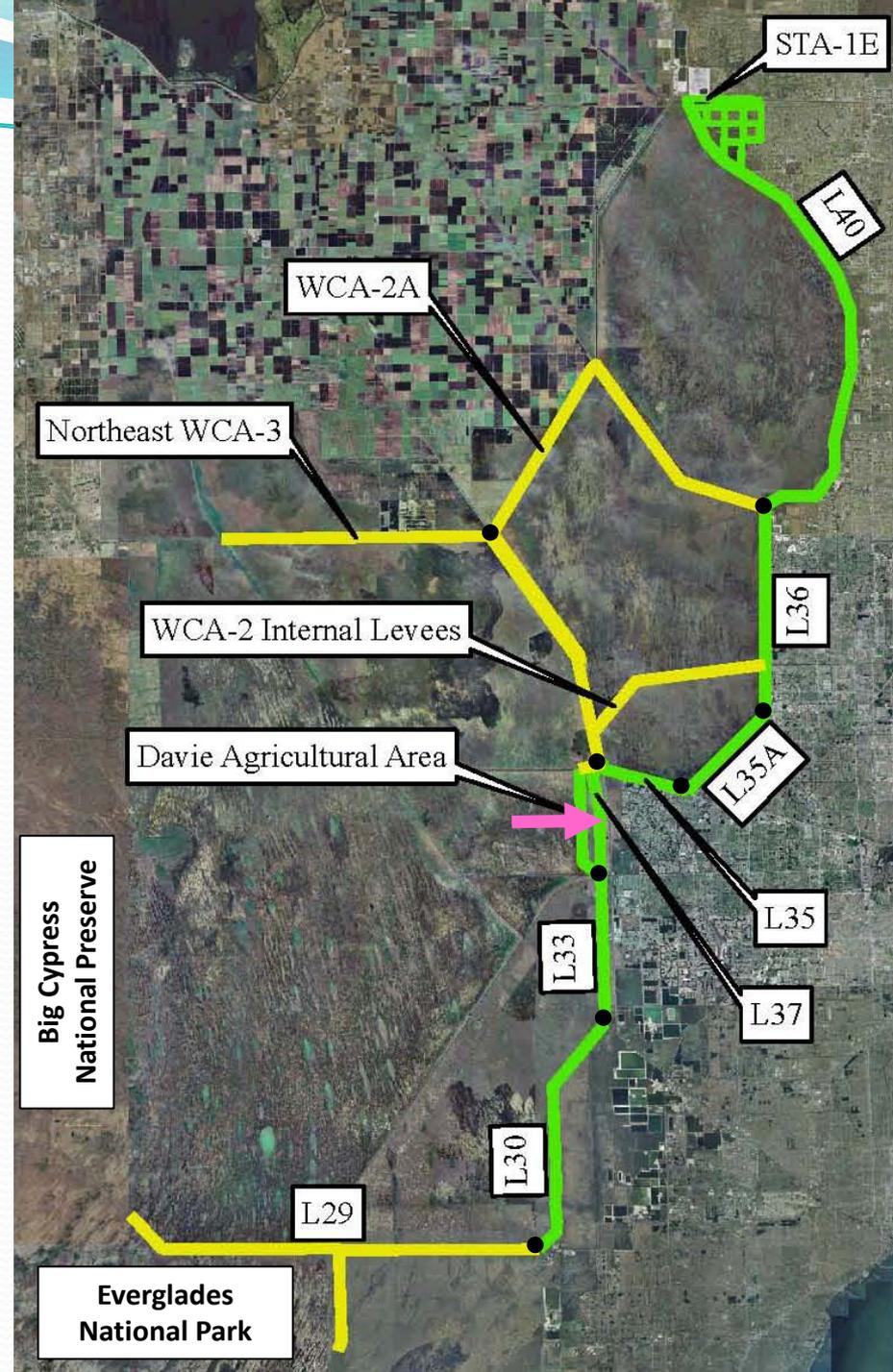
L35 - ECPL

- Remove unwanted vegetation – U ✓
- Remove or monitor encroachments
- Conduct seepage and stability analyses – U ✓
- Remove/relocate burrowing animals
- Clean and repair concrete and corroded material
- Repair cracks in foundations



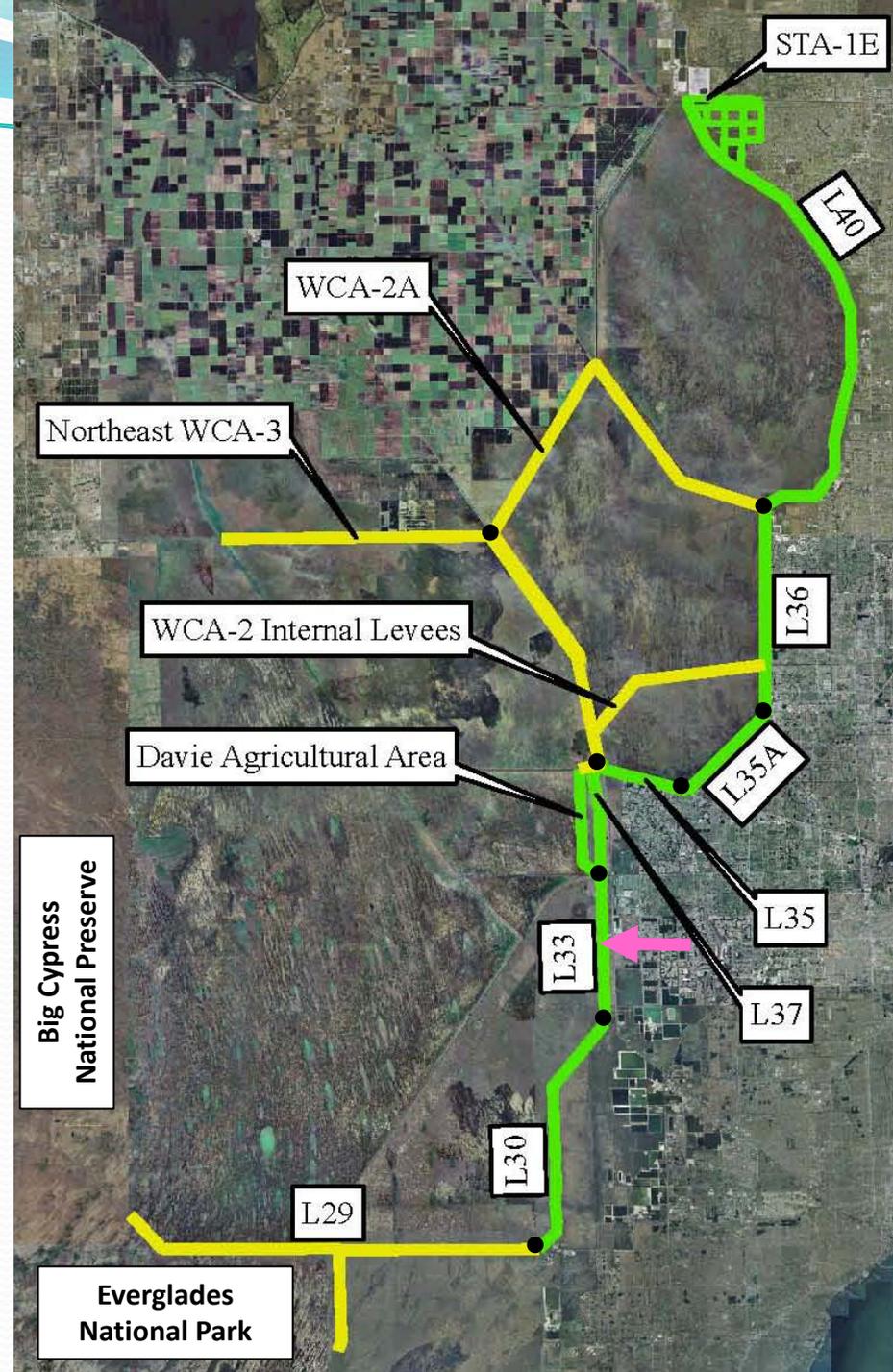
L37 - ECPL

- Remove unwanted vegetation – U ✓
- Remove or monitor encroachments – U
- Conduct seepage and stability analyses ✓
- Remove/relocate burrowing animals
- Clean and repair concrete and corroded material
- Repair cracks in foundations



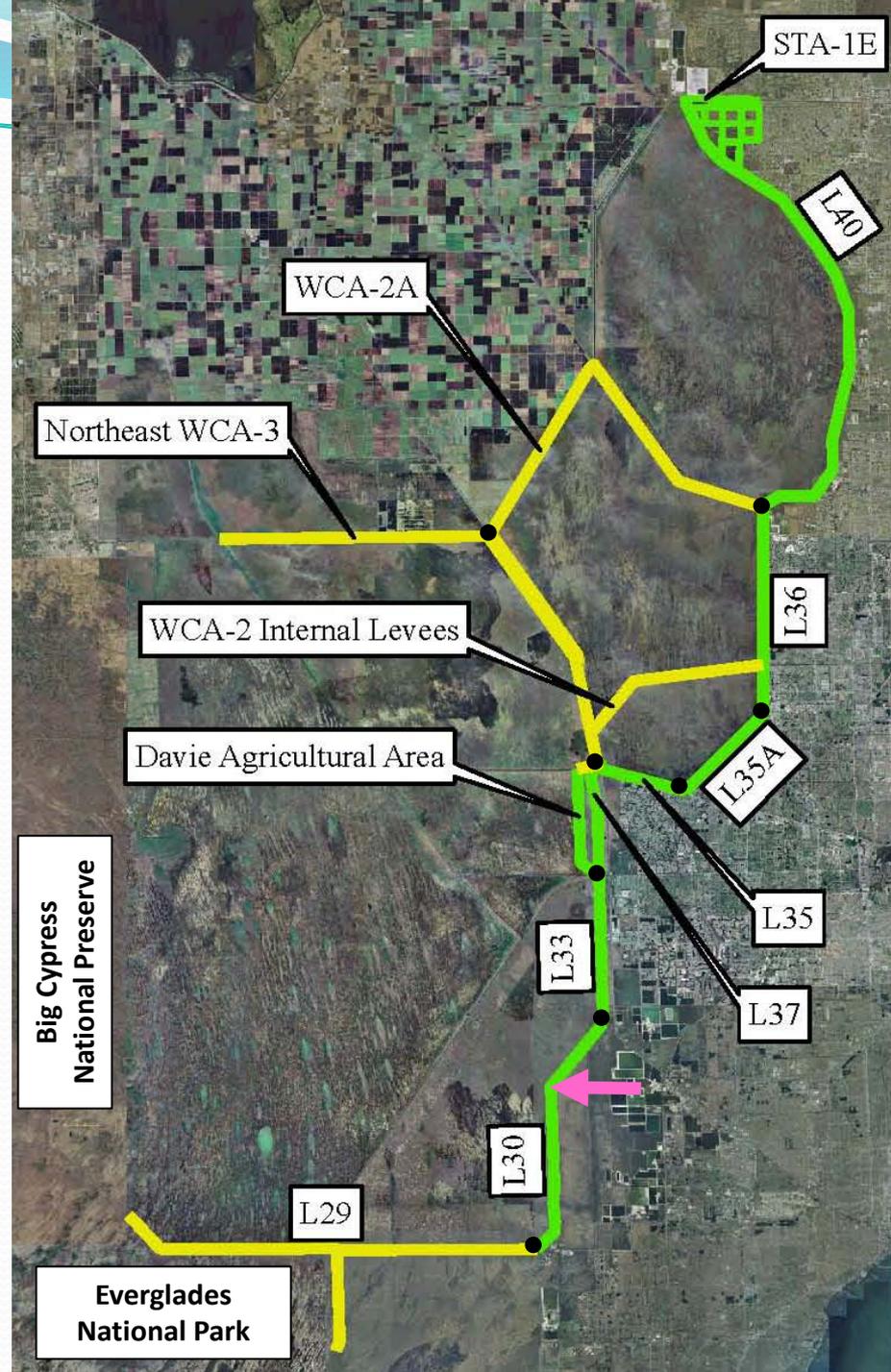
L33 – ECPL

- Remove unwanted vegetation – U ✓
- Remove or monitor encroachments
- Conduct seepage and stability analyses – U ✓
- Repair erosion, remove/relocate burrowing animals
- Replace concrete barriers with security fencing – U
- Repair damaged concrete and foundations – U



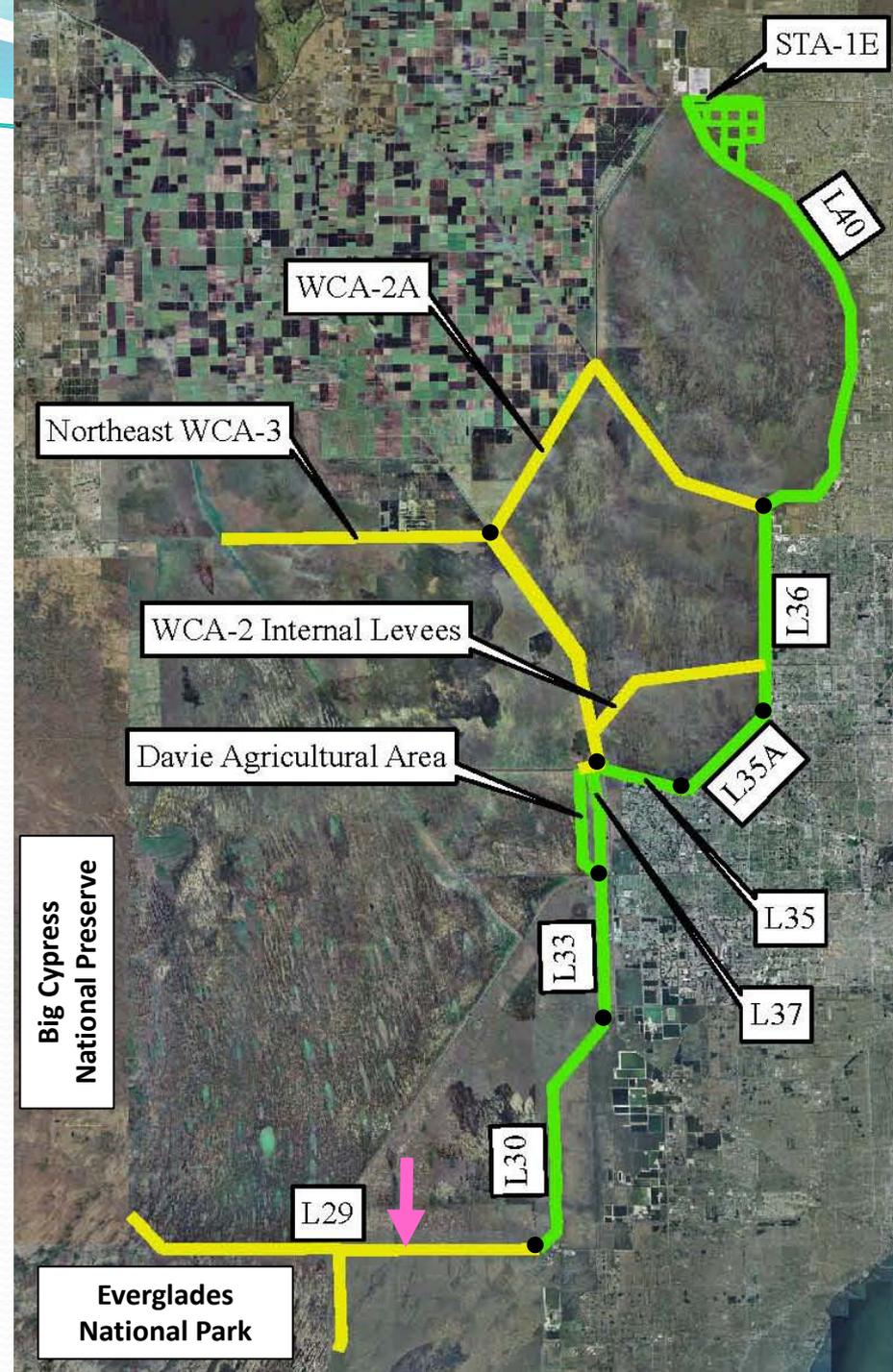
L30 – ECPL

- Remove unwanted vegetation – U ✓
- Repair seepage problems at 4 select locations - U
- Repairs and maintenance for 4 structures - U



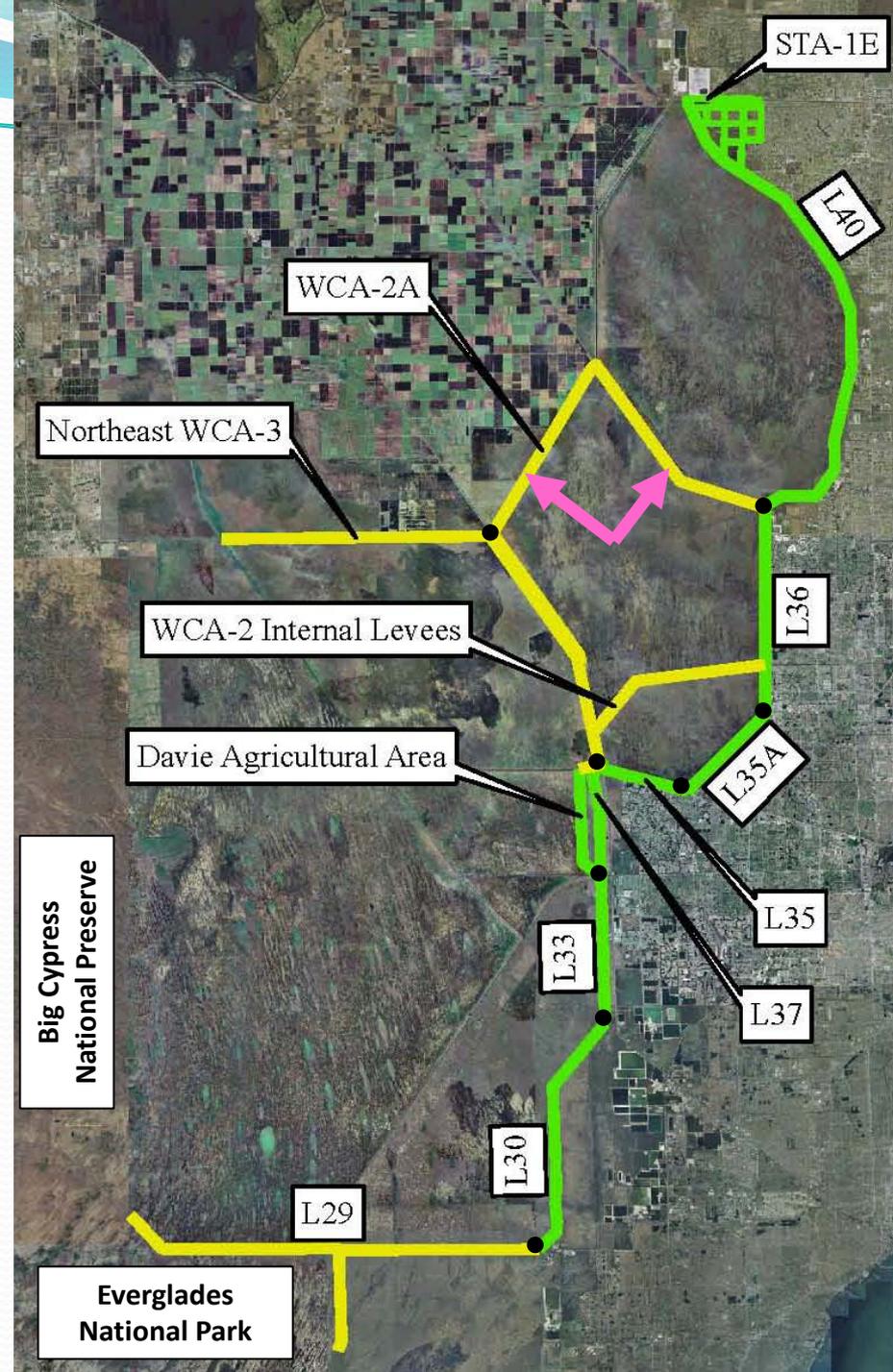
L29

- Remove unwanted vegetation - U
- Settlement, depressions and rutting - U
- Repair areas of seepage and regrade slope back to design
- Improve measures to keep animals from damaging levee embankment
- Some federal structures will require repair



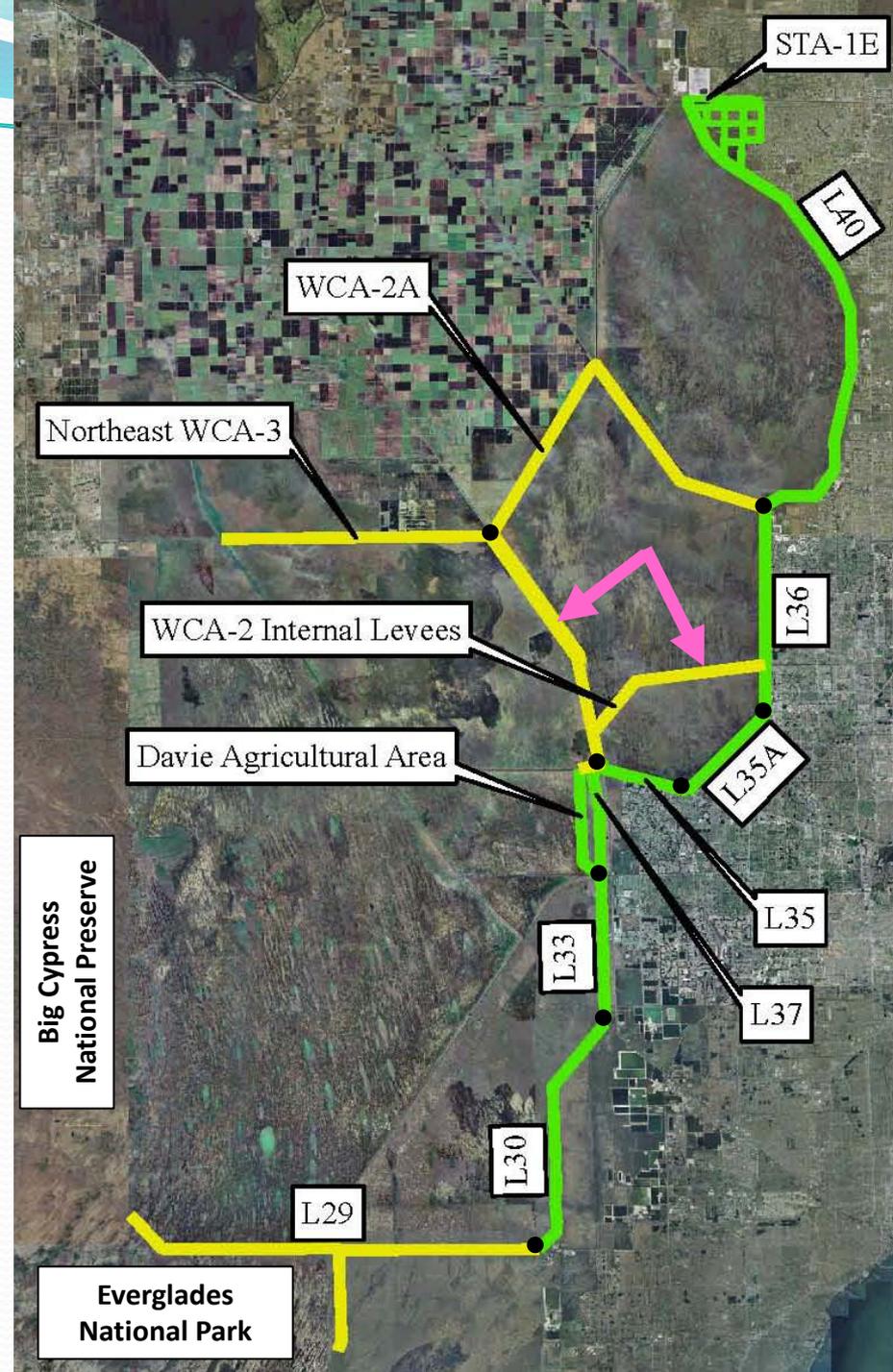
WCA 2A

- Modification of 9.6 miles of L6 exterior levee (STA2) – U
- Remove unwanted vegetation - U
- Repairs and maintenance to culverts – U



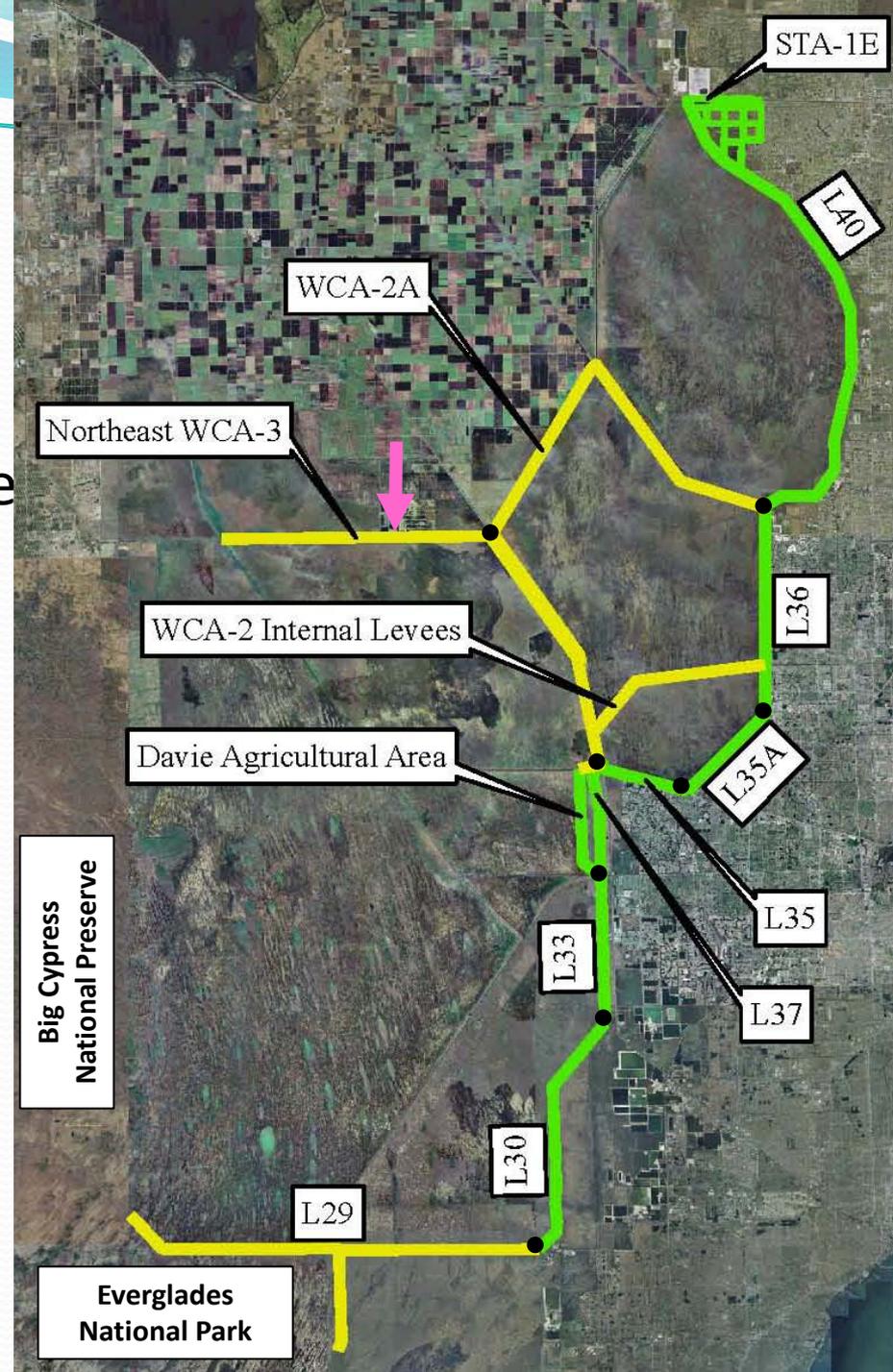
WCA 2 Internal

- Remove unwanted vegetation – U ✓
- Settlement below design elevation – U
- Structure maintenance for 5 structures



Northeast WCA 3

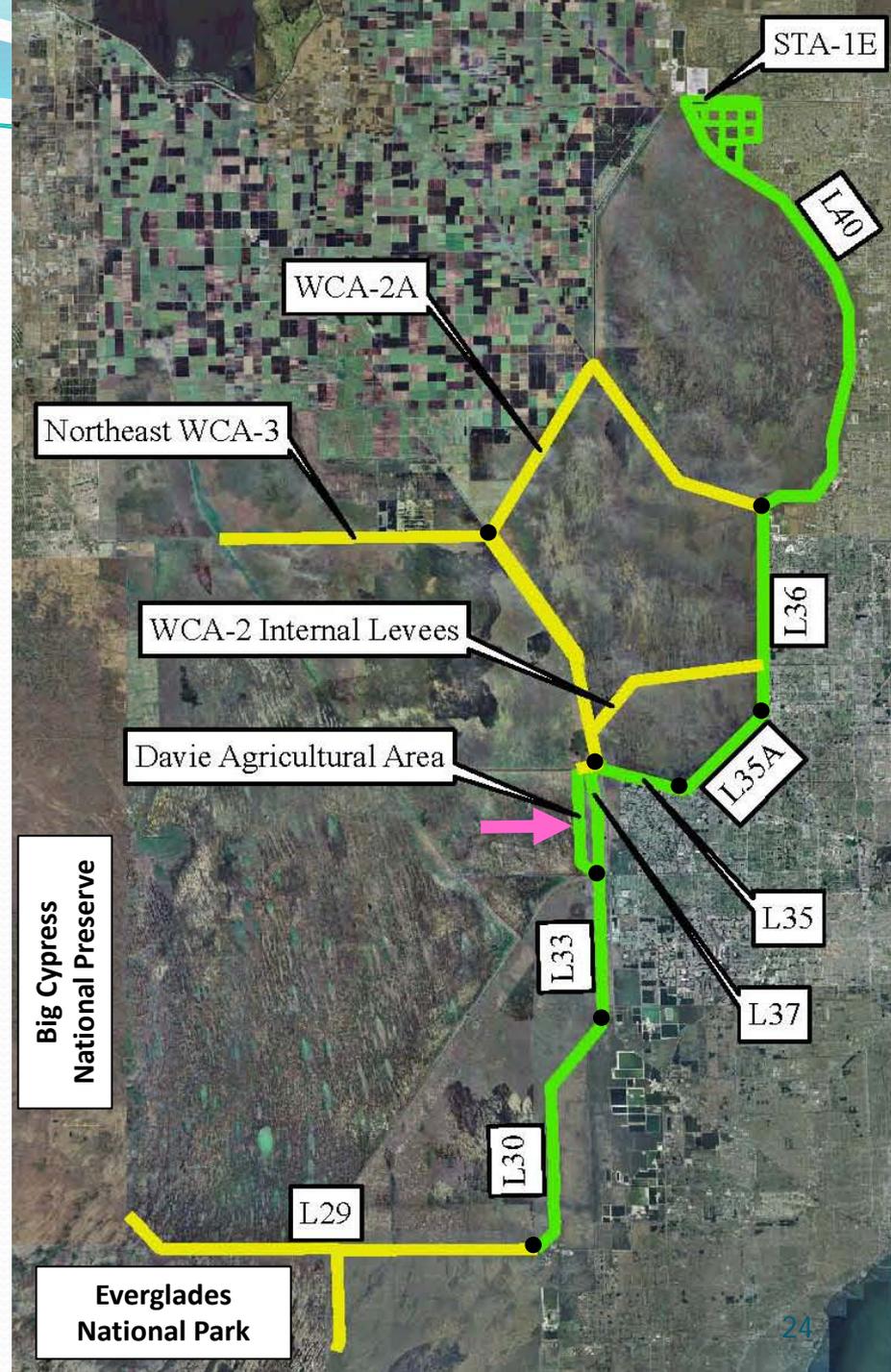
- Remove unwanted vegetation
- Remove or obtain acceptance for encroachments
- Regrade, fill, compact and sod areas of erosion
- Evaluate settling - U
- Fill and sod depressions & rutting
- Perform maintenance to structures & Pump Station S-8



Davie

Agricultural Area

- Remove unwanted vegetation – U
- Remove or obtain acceptance for encroachments





Questions?