



# CAGRD

CENTRAL ARIZONA GROUNDWATER  
REPLENISHMENT DISTRICT

A Division of Central Arizona Project

# YMIDD/CAGRD PILOT ROTATIONAL FALLOWING PROGRAM

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# What is the CAGRD?

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- New development in Arizona's large metropolitan areas must comply with Assured Water Supply Program requirements that are among the most stringent in the county.
- Membership in the CAGRD provides a mechanism for entities lacking renewable water supplies, but with reliable groundwater supplies to adhere to consistency with AMA goals requirement.

# CAGRDR Relationship to CAWCD

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- The CAGRDR is a special function of CAWCD (same legal entity) and responsible for replenishing members groundwater pumping.
- CAGRDR and CAP serve the same constituents – Maricopa, Pima and Pinal county residents
- Members pay **entire** costs of CAGRDR membership

# CAGRD Membership

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CAGRD members include:

- Water users without CAP subcontracts
- Water users with CAP subcontracts insufficient to meet their needs
- CAP subcontractors without direct access to CAP water

Two types of CAGRD members:

- Member Service Areas (MSAs): municipalities and private water companies
- Member Lands (MLs): individual subdivisions and master-planned developments

# CAGRD Administration

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- CAGRD members annually report "excess" groundwater use to CAGRD and to ADWR
- Members pay CAGRD assessments based on amount of "excess" groundwater reported
- CAGRD uses member assessments and fees to purchase renewable water supplies to replenish the aquifer
- CAGRD's only "delivery customer" is the aquifer

# 2017/2018 CAGRD Member Land Assessment Rate

Acre-Foot Assessment Rate Components (Phoenix AMA)	
Water & Replenishment	\$214
Administrative	\$36
Infrastructure & Water Rights	\$353
Replenishment Reserve	\$101
Total Assessment (\$/AF)	\$704
Annual Membership Due (\$/Lot)	
Phoenix AMA	\$22.63
Pinal AMA	\$14.88
Tucson AMA	\$23.58

# CAGRD's Water Supply Program

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- CAGRD's Water Supply Program (WSP) is responsible for acquiring water supplies to meet its member's replenishment obligation
- 22 water supply acquisitions to date: Long-Term Storage Credits, effluent, CAP M&I and NIA-priority water, plus Quartzsite lease

# CAGRD's Water Supply Program – Recent History

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- March 2011: CAWCD Board authorized staff to conduct a Water Supply Acquisition Study
- May 2012: Board directed CAWCD management to implement a more robust CAGRD WSP
- October 2013: CAWCD Board of Director's approved amended WSP Principles resolution.



# CAGRD's Water Supply Program Principles

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- Acquire a diverse water supply portfolio through voluntary, mutually-beneficial market-based transactions
- Portfolio diversity has two distinct benefits:
  - 1) Risk reduction of supply interruptions (i.e., shortage) associated with any single or dominant water supply type
  - 2) Reduces impact to the geographic area from which any single supply is acquired
- Assess third-party impacts to local community

# CAGRD: Current and Projected Obligations

30,922 AF  
2016  
Obligation

86,900 AF  
2034 Projected  
Obligation

113,000 AF  
2114 Projected  
Obligation

22 Authorized  
Acquisition  
Projects

38,166 AF  
Current  
Supplies\*

\*Not Firmed

# Typical CAGRDR Subdivision



# Typical CAGRDR Subdivision

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# “Atypical” CAGR Subdivision

## Camelback Garden Farms





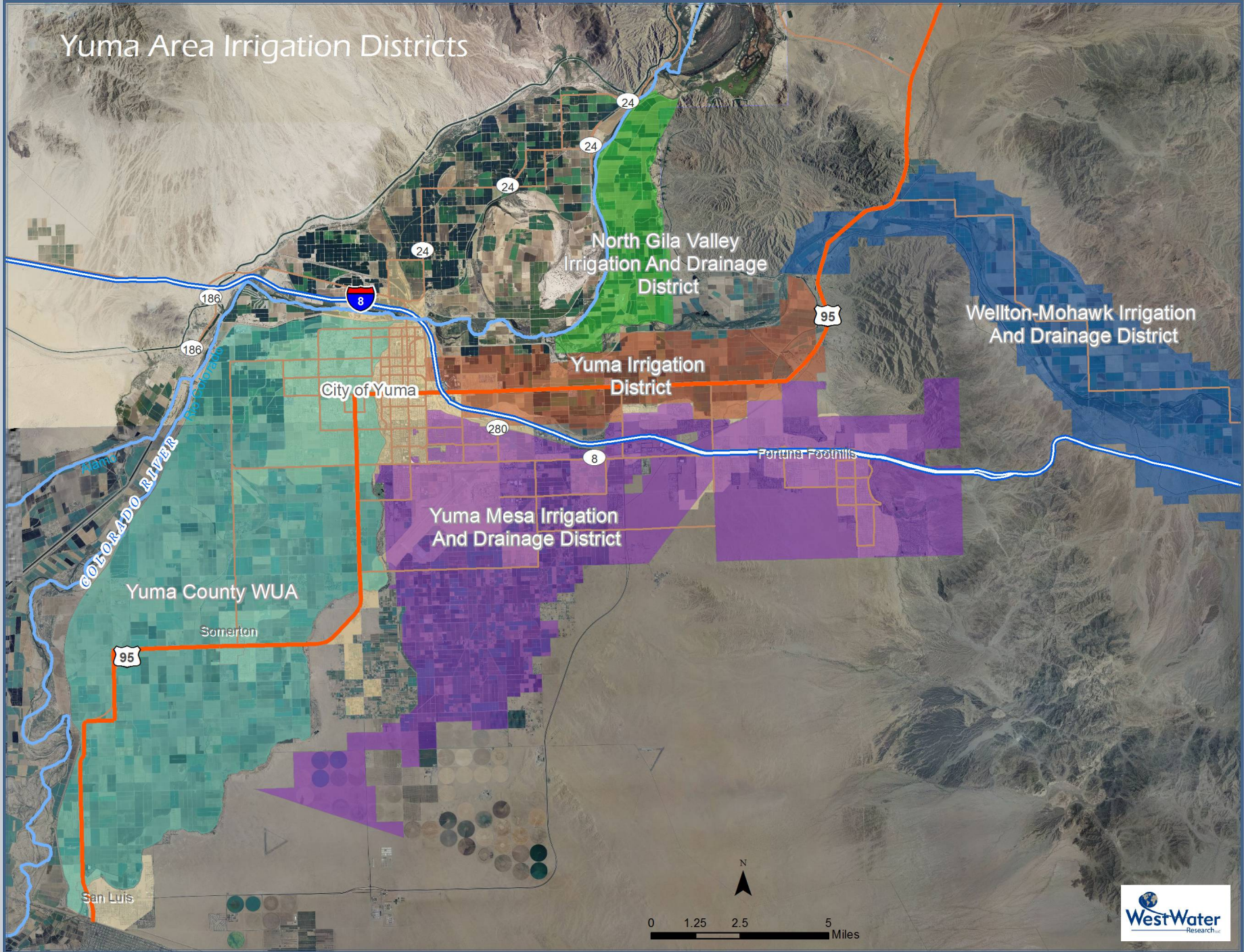
**CAGRDR**

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# **Yuma Mesa Irrigation & Drainage District Pilot Rotational Fallowing Program**

# Yuma Area Irrigation Districts



# YMIDD/Reclamation Demonstration Program

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- 2008 – 2010 YMIDD participated in a Reclamation Demonstration Program for System Conservation of Colorado River water
  - Federal budget issues
  - “Baseline” issues
  - Water savings stipulation of 7AF/acre
  - Did not quantify or confirm water savings



# YMIDD/CAWCD Following Program Objectives

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- “Proof of concept” that voluntary, mutually beneficial, temporary agriculture to urban water transfers are possible
- Develop data, methodologies and processes to inform a future longer-term water supply following program
- Obtain annual conserved water quantification volume
- Prove that mutually beneficial, willing seller / willing buyer, temporary agriculture to urban water transfers are possible (i.e., proof of concept)

# Following Water Conservation

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- Entitlement holder voluntarily agrees to forego the use of a portion of the approved annual entitlement of Colorado River water
- Conservation savings quantified based upon the foregone beneficial water use that would otherwise have occurred
- Annual conserved water volume was retained in Lake Mead

# YMIDD & CAGRDR Pilot Program

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- September 2013: CAWCD Board approves the pilot program
- Two 3 year terms (2014-2016; 2017-2019)
  - Parties re-evaluated in 2016 & did not renew second term
- Total fallowed acres approximately 1,500; approximately 10% of current irrigated acres within YMIDD
- Farmers paid to fallow lands that would otherwise be farmed

# YMIDD & CAGRDR Pilot Program

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- “Qualified Land” must have produced crops in 4 of the last 5 years (2009 – 2013), at least 5 contiguous acres, minimum ownership of 35 acres and would be irrigated if not enrolled in the program
- Scale: Enrollment capped at 15.7% of total irrigated acres for most landowners (approx. 10% for large landowners) or 1,500 acres
- Base Price = \$750/AC; District Reimbursement = \$21.36/AC; District Administration = \$10,000/YR
  - Total Program Payments = \$3.345 Million
  - Approximate \$/AF = \$155/AF

# Water Savings Quantification

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- Forgone Consumptive Crop Water Use:
  - Crop mapping: Develop crop mapping from years 2010 – 2013; visited the district and recorded field and crop information using a GPS and current satellite imagery
  - Determine consumptive crop water use by the crops identified in the mapping
  - Used app to efficiently verify bi-annual program compliance

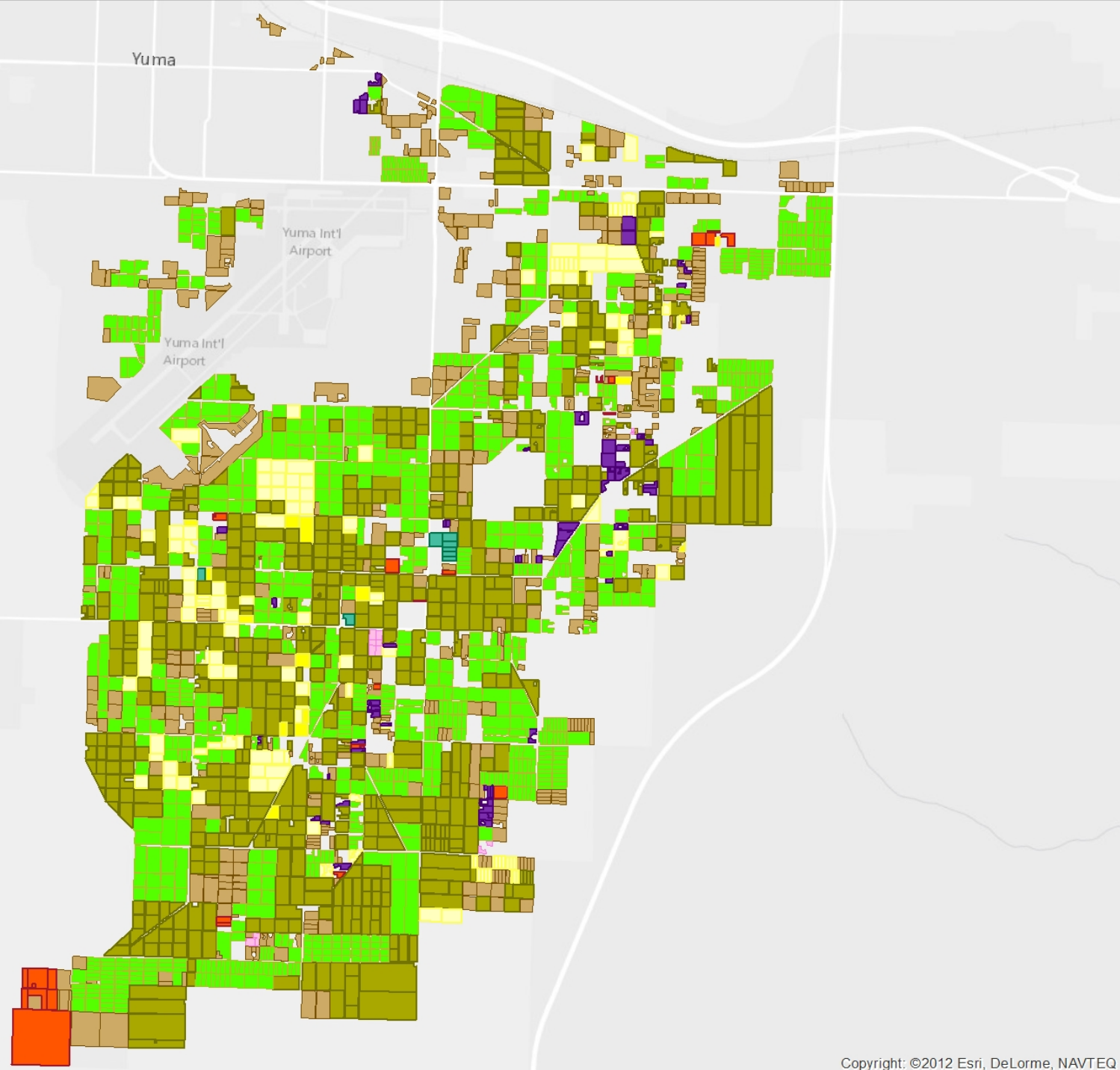
# Water Savings Quantification

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- Forgone Consumptive Crop Water Use:
  - The south Yuma AZMET station was used for daily reference evapotranspiration (Eto) values for the years of interest
  - Crop coefficients and durations of growth stages were taken from chapter 6 of U.N. FAO Irrigation and Drainage Paper No. 56
  - Irrigation efficiencies, distribution uniformity and conveyance losses assumed based on in field observations and published documentation, i.e., University of Arizona publications, extension bulletins, etc.

### Crop Types

- Declining Citrus
- Alfalfa
- Almonds
- Palms
- Fallow
- Grass Hay
- Irrigated Lawn
- Irrigated Pasture
- Mature Citrus
- Nursery
- Olives
- Sudan Grass
- Young Citrus



# Water Savings Quantification

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## YMIDD PILOT FOLLOWING PROGRAM

	2014	2015	2016
Enrolled Acres	1,406	1,411	1,400
Conserved Water (AF)	6,827	7,180	7,509
AF/ACRE	4.86	5.09	5.36



# Pilot Fallowing Program Benefits

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- Provides a stable revenue stream for YMIDD farmers with limited impact on current farming operations
- Avoids permanent loss of productive agricultural land and avoids or minimizes any adverse local economic impact
- Enhances existing rotational farming practices
- Serves an agronomic benefit by allowing a longer rest-rotation than normal practice; reduced soil pests and increased yields

# Pilot Fallowing Program Benefits

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- Allows CAGRD to develop data, methodologies and processes to inform a future longer-term water supply fallowing program
- Developed working relationship with on-river entitlement holders
- Conserved water supply retained in Lake Mead helped to avoid shortages to water users in Arizona and the Lower Basin







# Additional Resources

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- <http://www.cagrdr.com/water-supply-program>
- <http://www.cagrdr.com/water-supply-program/agreements-and-acquisitions>
- <http://www.cap-az.com/documents/meetings/2017-10-19/1653-3-YMIDD-web.pdf>



# CAP

CENTRAL ARIZONA PROJECT

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LAKE MEAD**



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