

Sampling Frame Overview

List Frame

Area Frame

Multiple Frame

2024 Delta Region

ARMS III / IWMS Workshop



The success of NASS programs depends on the quality of the Sampling Frame.

Thought for today



What is a Sampling Frame?

- A sampling frame is a device that associates elements of a population with the sampling units in the frame.
- A frame also has information about the size and structure of the population which can be used for sampling.
 - Control Data are associated with each operation and provide a snapshot of the type of entity (farm/ranch or agricultural business).
 - Examples of NASS Control Data: cropland acres, acreage of each crop grown, peak number of head of livestock, grain storage capacity.

NASS List Frame

- Serves as the foundation for the annual NASS survey programs and the Census of Agriculture.
 - All survey samples and the Census Mail List (CML) are selected from the List Frame.
- The Enhanced List Maintenance Operations (**ELMO**) system is used to maintain the NASS List Frame.
 - The database was designed to store and retrieve lists of actual and potential agricultural respondents and associated data.
- Control data stored for sampling (units).

NASS List Frame

*To publish timely, accurate and useful statistics to U.S. agriculture, the NASS List Frame must be of sufficiently high quality to serve both the survey and census programs.

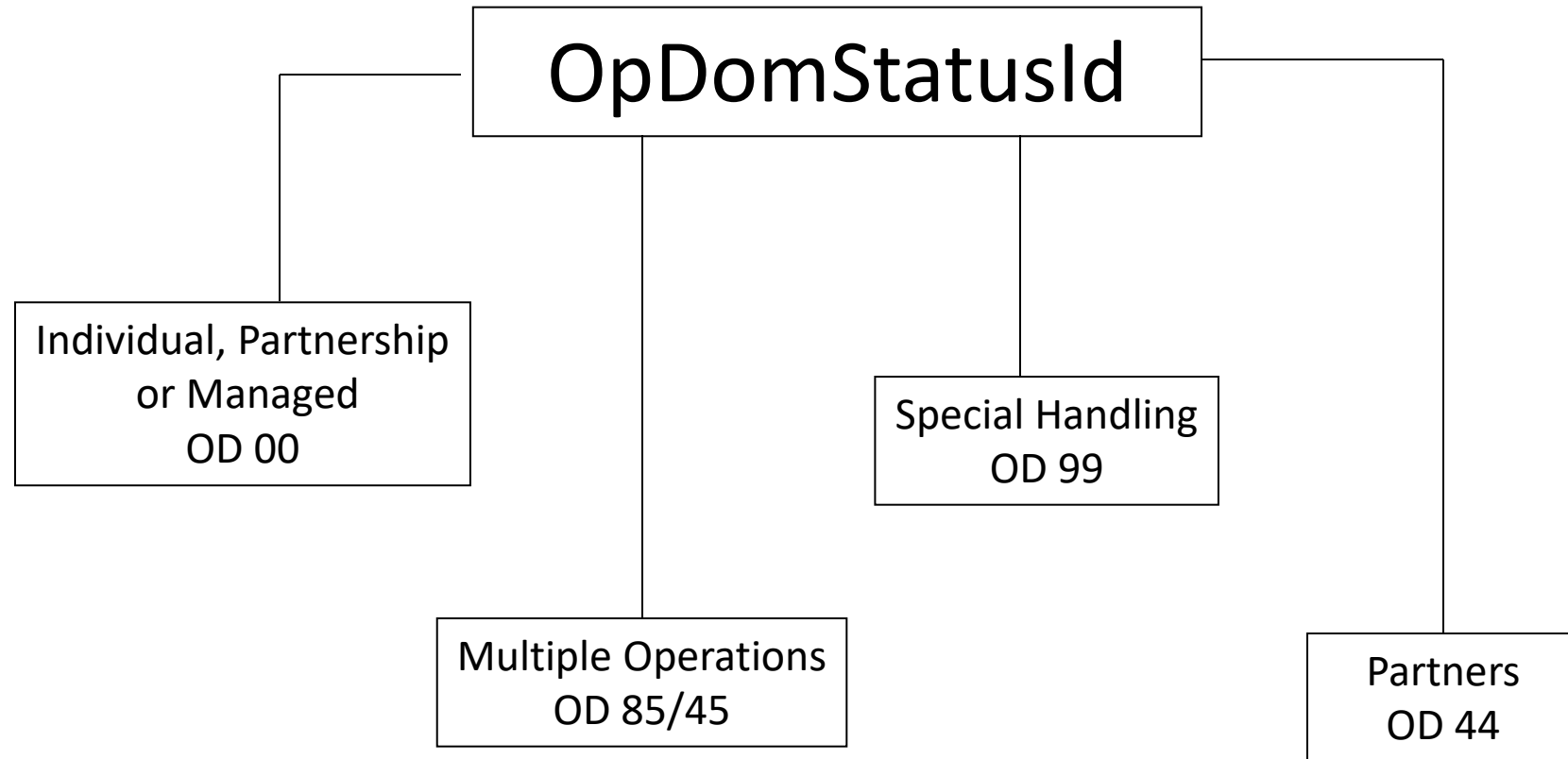
*A thin or incomplete list of farmers/ranchers produces poor sampling and poor estimates of crops and livestock.

***Duplication** within the list can also cause problems. Always needing accurate names, addresses, phone numbers, etc.

Operator Dominant

- Operator Dominant (OpDom): The target for a survey is the individual operator.
 - Operator dominant is the primary way that the List Frame is maintained, and sampling units are defined.
 - The target for a survey is the individual operator.

Operator Dominant Concepts



Operator Dominant Concepts

Individual Operation: OD 00

- One person involved in the operation
- TARGET: operator listed
- TARGET reports for all other operations that he/she is the target

Operator Dominant Concepts

Partnership Operation

- More than one individual involved in operation
 - TARGET: OD 00
 - Partners: OD 44
- TARGET reports for all other operations that he/she is the target

Operator Dominant Concepts

Multiple Operations: OD 85/45

- TARGET has more than one operation for which he/she makes decisions
- One operation is 'Parent Record' (OD 85)
 - Other associated operations are OD 45 (indicated with * in CAPI)
- Only one of the operations can be managed
 - Managed record MUST be the 'Parent Record'

Operator Dominant Concepts

Managed Operation: OD 00 (mgr flag)

- Decisions are made by a hired individual
- TARGET: Operation Name and Operator
- TARGET (Manager) reports for all other operations that he/she is the target

Operator Dominant Concepts

OD 99-Special Handling

- TARGET: Operation Name
- Special Handling: ONLY data for the TARGET are collected, regardless of associated operations
- Used when more than one MANAGED operation exists
- Each operation is sampled separately

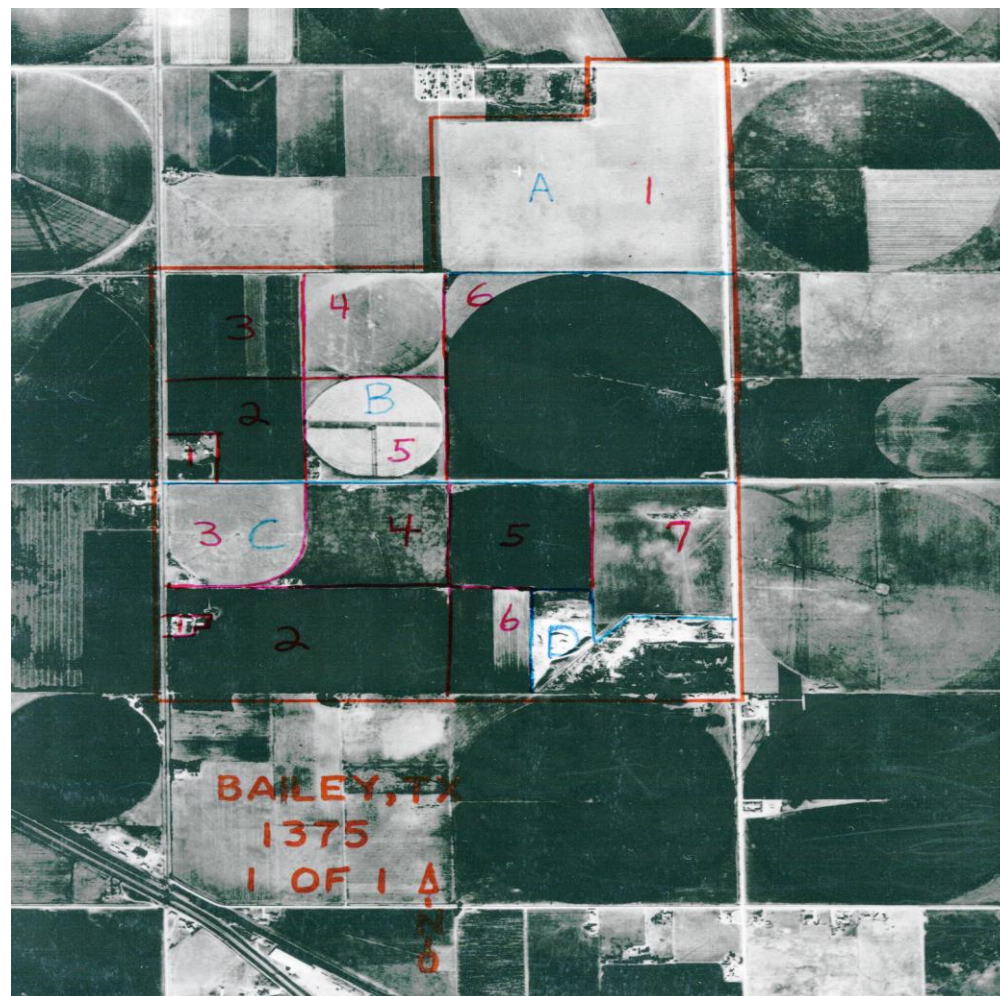
NASS Area Frame

- What is it?
 - Since no list frame is complete, NASS also uses an Area Frame to find farmers not on the list (NOL). Those found to be on the list are overlap (OL) and aren't used for sampling.
 - Land area of the U.S. divided into segments using physical boundaries
 - Associate farms, crops, animals, etc. with land inside the segments
 - POIDS start with a "1"

NASS Area Frame

- How is it constructed?
 - Using satellite imagery, topographic maps, GIS software, aerial photography.
 - Divide land area into strata based on land use & likelihood of finding agriculture

NASS Area Frame



NASS Area Frame

- How is it used?
- **sample**
 - select a sample of segments – generally keep segments in sample for 5 years, rotate 20% of sample each year
- **survey**
 - account for all land inside segment boundaries, obtain information about all farms with land inside segments
- **summarize**
 - expand data using probabilities of selection (based on land area)
 - * tract level and farm level

NASS Area Frame

Strengths:

- ✓ complete coverage
- ✓ reduced non-sampling errors
- ✓ estimates well for commonly produced commodities
- ✓ versatility
- ✓ longevity

NASS Area Frame

Weaknesses:

- ✗ expensive (frame construction & data collection)
- ✗ difficult to target specific or rare commodities
- ✗ sensitive to outliers
- ✗ can be inefficient
- ✗ requires definable physical boundaries

NASS Multiple Frame

Combining the two frames:

- NASS often uses a combination of these two frames, known as a (multiple frame) concept
- List Frame + Area Frame = Multiple Frame

NASS Multiple Frame

Strengths:

- ✓ together frames cover target population
- ✓ can control variability due to sampling
- ✓ can control costs with large list, small area samples
- ✓ can target specific or rare commodities
- ✓ Helps ensure strong indications and, ultimately, reliable estimates for publishing.

The End

Questions?

