By establishing a solid definition of “Private Airspace”, the FAA (or Congress) can resolve most airspace claims.

A modest Proposal:

The current position of the FAA is that they have jurisdiction over any unsupported object above all property within our national boundaries from the surface to the heavens. This is clearly a massive taking of the use of private property "Airspace" without justification or compensation that will be endlessly challenged unless some compromise definition of "Private Airspace" is agreed to. The purpose of this proposal is to suggest a compromise that may be acceptable to all parties. The need for this compromise has arisen with the advent of sUAS craft (Small Unmanned Aircraft Systems) - "Drones". There are now many entities competing for the control of "Airspace". A sampling includes: FAA, NASA, Military, Airlines, General Aviation, Emergency Services, Law Enforcement, Medical and Parcel Delivery, Municipal and Tribal Entities, Model Aircraft and Drones, and Private Property Owners. Clearly private property owners have gotten the short end of the stick. Among private property owners there are two competing camps, those who want to prohibit low altitude overflight, and those who want employ UAS for various purposes on their own property. It will be far better to face this contest head on by regulation or legislation than to let it wallow in court contests and uncertainty. The draft legislation below is an attempt to satisfy all claims.

Premises:

The FAA controls all airspace above 400 feet AGL and all airspace to the ground around designated takeoff and landing zones.

The FAA has no jurisdiction over "Private Airspace" as defined by this compromise.

Tribal, State, Local, and Municipal entities may regulate "Private Airspace", but they may not summarily prohibit the free use of it.

Criminal, Tort and Civil Law apply in "Private Airspace" trespass, abuse, privacy invasion, injuries, disturbances, threats, and disputes.

No Certification, Licensing, or Regulation of any aircraft or pilot can be required by the FAA as long as the aircraft remains within its Private Airspace or within Public Airspace where permission has been granted.

FCC regulations must be observed by Private Airspace users, but FCC regulations may not be adjusted as a means to deny "Private Airspace" use.

The above premises are very similar to the way automobiles on private property are treated.

The definition of "Private Airspace":

Private Airspace is associated with real private property or vessels on navigable waterways.

Private Airspace has two distinct bounds - one for the unrestricted *use* by the owner, the other for restriction of other's trespass.

The volume of "*Use* Private Airspace" is all points above the corresponding real private property vertically to 400ft above ground level, excluding any point where the altitude is greater than the distance to the nearest associated private property boundary.

The no trespassing boundary of private air space is the entire volume directly above private property to 400ft AGL.

The no trespassing boundary over vessels on open water extends upward from the perimeter of the vessel at 45 degrees to 400ft.

The definition of Public Airspace:

Public Airspace is any airspace below 400ft AGL that is not over private property and not administered by the FAA.

It is assumed that all public airspace has some controlling authority.

Airspace below 400ft over navigable waterways is managed by the primary authority controlling surface navigation of that waterway (USCG, Tribal, State, Local, etc).

The entry of any UAS into public airspace without written permission or public notice of permission is a trespass of severity determined by the controlling authority.

The definition of National Airspace:

National Airspace is all airspace administered by the FAA (Airspace above 400ft AGL and airspace around designated takeoff and landing zones)

The entry of any UAS into National Airspace must be in compliance with FAA regulations or its pilot/owner may face Federal criminal prosecution.

By defining airspace use rights in this way, all entry into national, public, or private airspace without explicit permission is criminal. This greatly simplifies the law enforcement dilemma, and coupled with an educational campaign, it should be a great deterrent to foolishness. It provides a path to clear airspace access for crop dusting and agricultural drone use. It also eliminates the need for RID in private and permitted public airspace. If unregulated UAS are allowed to fly only with written permission or public notice in public or private airspace below 400ft, then UAS intentionally flying anywhere else could be interdicted and their pilots/owners prosecuted severely. This should be well received by the public, law enforcement, and the aviation community. While the FAA would not control low altitude airspace, it should serve as a clearing house for contemporaneous information about that airspace. This information could be presented in a FAA managed APP that alerts users of emergency or law enforcement action requiring grounding of all civilian UAS in their vicinity. Thus, previously granted permission for UAS flight could be temporarily rescinded instantly.

A virtual No Trespassing sign is assumed to exist on <u>all airspace</u> where entry permission has not been explicitly given.

The properties of "Private Airspace":

Private Airspace is real property that can be leased, sold and inherited in whole or in part similar to mineral rights.

Permission to use Private Airspace may be granted to anybody at the discretion of the airspace owner or lessee. The permission must be in writing, and any conditions must be included.
The permission may be rescinded by written notice.

Private Airspaces may be joined by written agreement.

Enforcement of "Private Airspace" rights:

All airspace below 400ft is outside of FAA jurisdiction except for designated takeoff and landing zones.

Intentional violation of the 400ft ceiling for unregulated craft or entry into any FAA controlled airspace without complying with all FAA regulations is a Federal crime.

Takeoff and landing rights in private airspace must be at the discretion of the airspace owner.

Tribal, State, Municipal and Local jurisdiction rules apply outside of FAA jurisdiction.
This makes sense because, unlike the FAA, these jurisdictions have police assets to enable enforcement of rules they enact.

Intentional violation of Private Airspace no trespassing boundaries may be a felony or Federal crime.

Violation of the truncated Private Airspace *use* boundaries by the airspace owner or lessee while still over the corresponding surface property may be no more than a misdemeanor, unless other tort is involved (peeping, assault, surveillance, etc.)

Discernment of Private Airspace boundaries

Violation of airspace boundaries can easily be demonstrated with geotagged smartphone photographs or video. This would be enhanced by requiring the Ford Foundation RID solution of encoding identification information on an anti-collision light blink.

Discernment of Private Airspace boundaries can be easily achieved in flight by pointing a camera down at 45 degrees and yawing 360 degrees - if the camera image center is always within the private property boundary, the craft is within the truncated *Use* Private Airspace boundary.

The path forward

Either the FAA will decide to have a truly Uniform Traffic Management scheme that includes UAS and manned aircraft, or UAS will be constrained to an exclusive airspace. If there must be separate flight levels devoted to commercial delivery UAS, the only reasonable solution is to move the floor of manned airspace up to allocate space for unmanned aircraft. If the FAA attempts to confiscate the low altitude private airspace of the citizenry and gift it to for-profit commercial interests, there will be a massive revolt. The anger of the people will be justified if 100-pound craft are zooming over homes and playgrounds at 200ft AGL. Commercial delivery UAS must be kept above 500ft and in the *Navigable Airspace of the United States* that the FAA legitimately controls. An advantage of limiting commercial delivery UAS to an airspace above 500ft is an enormous reduction of potential fixed flight path obstacles.

A note about enforcement:

Much has been said about locating the remote pilots of offending drones. The reality is that these pilots are desperate to recover their craft at the conclusion of flight. They may be ignorant of the laws, but sooner or later their flights will be reported to 911. The local police simply need to follow the craft to landing to apprehend the offender. If the pilot is a nefarious actor or terrorist, no law will be effective in revealing their position.

Some issues to resolve:

The need for med-evac helicopters, hot air balloons, parachutist, flight training, hang gliders, crop dusters, and low altitude military exercises to safely penetrate the commercial Drone Zone (500 to 1,000ft AGL) on a moment's notice must be accommodated. Clearly, some form of Remote Identification in this shared airspace is necessary, and it must be closely coordinated with ATC airspace. The present RID concept seems more focused on DHS and law enforcement desires than air traffic safety. The obvious answer is that ATC must control all airspace above 500ft AGL. This does not require that air traffic controllers focus on drone traffic, the drone zone traffic control could be fully automated. The ATC controllers only need a tool to clear specific areas of drone traffic by defining a no drone zone on the scope. This could be accomplished automatically for some traffic, such as when an emergency response helicopter pilot puts a destination location into a flight plan. It is clear that while a network (cell or satellite) connection may work well to organize and direct commercial drone zone traffic (500 to 1,000ft), ADS-B must also be carried by these craft. ADS-B for commercial UAS can carry codes that allow them to be selectively blanked from ATC displays. At some point in the future, when UAS traffic grows to a point that begins to tax the ADS-B radio spectrum allocation, new spectrum should be allocated and required for UAS. UAS that never fly above 400ft, never enter "National Airspace", and never fly outside of explicitly permitted boundaries, should be allowed to fly unregulated and non-RID equipped, thus the ATC management and ADS-B systems are not over-taxed. The responsibility for observing airspace boundaries should always rest with the remote pilot, and it should not be mandated to geofencing. If universal UAS identification is demanded, it should be accomplished with a simple low range add on broadcast system that identifies the owner by number, similar to automobile license plates.

Airspace conflicts between Aerial Application Aircraft and agricultural drone use:

The use of sUAS "drones" on farms is a rapidly growing technology in its infancy. UAS equipment will inevitably begin to eat into the market share of manned aircraft for aerial application. In the interim a method for sharing the airspace must be developed. Until now, ag pilots have had free reign in very low altitude airspace. They zoom in to a field over an adjacent property owner's airspace at dangerous altitudes with impunity, and then they pull up after a run at their leisure. Clearly this type of airspace sharing cannot continue. The solution is a definition of "Private Airspace" that allows a farmer in one field to use aerial application while a farmer in an adjacent field uses drones for livestock herding. The obvious issue is the essential need to obtain permission from an airspace owner to enter his "Private Airspace". Technology will not solve this conflict. It must be resolved by defining "Private Airspace" and its associated rights.