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Denying Flight

Strategic Options for Employing No-Fly Zones

Karl P. Mueller

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Karl P. Mueller

RAND Project AIR FORCE

Prepared for the United States Air Force
Approved for public release; distribution unlimited



The research described in this report was sponsored by the United States Air Force under Contract FA7014-06-C-0001. Further information may be obtained from the Strategic Planning Division, Directorate of Plans, Hq USAF.

Library of Congress Cataloging-in-Publication Data

Mueller, Karl P.
Denying flight : strategic options for employing no-fly zones / Karl P. Mueller.
pages cm
Includes bibliographical references.
ISBN 978-0-8330-8178-0 (pbk. : alk. paper)
1. Air warfare—Case studies. 2. Air power—Case studies. 3. Air traffic rules,
International. 4. United States—Military policy. I. Title. II. Title: Strategic options for
employing no-fly zones.

UG632.M84 2013
358.4'142—dc23

2013047281

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Preface

In recent years, discussions about external military intervention in local conflicts have often included consideration of “no-fly zones” (NFZs) as a policy option. In the past two decades, the U.S. Air Force has participated in three contingencies involving NFZs over Bosnia, Iraq, and Libya, and NFZ proposals have been proffered for some time as an option for intervention in the Syrian civil war that would avoid placing Western troops on the ground. This paper is intended as a preliminary look at NFZs as a strategic approach in such situations, with an emphasis on the forms they might take, their potential utility, and their probable limitations. It should be of interest to readers participating or interested in decisionmaking about military intervention, as well as Air Force and other defense personnel who bear the responsibility of planning for and executing such operations.

The research reported here was made possible by RAND concept formulation funds and was conducted within the Strategy and Doctrine Program of RAND Project AIR FORCE.

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Abbreviations

AAA	antiaircraft artillery
AEW&C	airborne early warning and control
AWACS	Airborne Warning and Control System
CAP	combat air patrol
CAS	close air support
DEAD	destruction of enemy air defenses
IADS	integrated air defense system
NATO	North Atlantic Treaty Organization
NFZ	no-fly zone
OCA	offensive counter-air
ONW	Operation Northern Watch
OOD	Operation Odyssey Dawn
OSW	Operation Southern Watch
OUP	Operation Unified Protector
ROE	rules of engagement
SAM	surface-to-air missile
SEAD	suppression of enemy air defenses
UNSCR	United Nations Security Council Resolution

Denying Flight: Strategic Options for Employing No-Fly Zones

Since the end of the Cold War, “no-fly zones” (NFZs)¹ have begun to appear on menus of policy options for dealing with troublesome states. Prohibiting a miscreant government from using airpower for warfare or transportation within its own country may appeal to policymakers, primarily because it is perhaps the most limited way that military force can be used as a punitive tool. Compared to other forms of armed intervention, NFZs typically entail relatively little risk to the powers imposing them, as least when directed against militarily weak targets. Yet, because they are an active use of military power, NFZs tend to seem more assertive than policy instruments such as economic sanctions.

Due to their limited nature, no-fly zones may also be relatively easy policy initiatives for international coalitions to agree on when they are keen to act against a target regime but wary of taking large risks or committing themselves to major military action. This was very much the case in early 2011, following uprisings against Libyan dictator Colonel Muammar Qaddafi and the Libyan government’s subsequent crackdown against its internal opponents. With a rising sense that the international community needed to do something to help the rebels, first the Gulf Cooperation Council, then the Arab League, and finally the United Nations voted to support the imposition of a NFZ over Libya, from which grew the 2011 air campaign against Qaddafi that enabled the Libyan opposition to defeat his regime and remove him from power (Operation Odyssey Dawn [OOD] and Operation Unified Protector [OUP]).

In the wake of the Libyan intervention, advocacy of a no-fly zone to prevent the Syrian government from using airpower against rebels in that civil war has been considerable. It seems likely that similar uses of NFZs will continue to be of interest in coming years, particularly as many Western countries are cutting defense spending and states are seeking to maintain international good order “on the cheap” in terms of both political liability and human and material cost. This paper provides a brief, initial exploration of the nature, variety, and potential utility of NFZs and, in the process, asks whether they are merely a trivial way to employ military power or whether they merit consideration as a significant strategic option in their own right.²

¹ The pidgin-like term *no-fly zone* is awkward, much like its sibling, *no-go area*. Calling NFZs *no-flight zones* would be more elegant, but this term has never become popular in spite of newspaper editors’ occasional efforts to advance it, and this essay does not argue the point.

² In the past, NFZs have rarely been the subject of scholarship beyond accounts of individual cases. Notable exceptions include Alexander Benard, “Lessons from Iraq and Bosnia on the Theory and Practice of No-fly Zones,” *Journal of Strategic Studies*, Vol. 27, No. 3, September 2004, pp. 454–478, and Michael N. Schmitt, “Clipped Wings: Effective and Legal No-Fly Zone Rules of Engagement,” *Loyola of Los Angeles International and Comparative Law Review*, Vol. 20, 1998, pp. 727–789.

Keeping Their Feet on the Ground: No-Fly Zones in Theory and Practice

For the purposes of this discussion, a *no-fly zone* can be defined as a policy under which an outside actor overtly prohibits some or all aircraft flight over a specified territory and undertakes to intercept aircraft violating the prohibition or otherwise punish those responsible for violations.³ Several features of this definition are worth noting. First, an NFZ thus defined does not include defending the sovereignty of one's own airspace or that of an allied state with the ally's consent. In a sense, it can be said that virtually every country has an NFZ of some sort over its own territory, often prohibiting all flights in particularly sensitive airspace, but these are not of interest here. Second, an NFZ is a declaratory policy under which one expects violators to be aware of the line they are crossing. Third, imposing an NFZ worthy of the name entails enforcing it, not merely complaining about those who violate it; normally, this means intercepting aircraft that defy the ban, though an NFZ could also employ an enforcement mechanism that relies on other, less-direct forms of sanction.⁴

The interest of this essay is NFZs that are not subsumed within larger military campaigns. This distinction can be fuzzy at the edges, but NFZs are essentially conditional: if you fly, you are subject to punishment, whereas in a war, enemy aircraft are subject to attack regardless of their behavior (though if they stay on the ground, attacking them might be judged not worth the trouble). Thus, when British and American fighters roamed over Germany in 1944 hunting *Luftwaffe* aircraft in the air and on the ground, they were establishing Allied air superiority over the Third Reich, not enforcing an NFZ.

No-Fly Zone Precursors

No-fly zones are a relatively new innovation in military and strategic art. Of course, they could not usefully exist until aviation developed to the point where denying someone the benefits of it would be significant. Moreover, proscribing flight over a substantial foreign territory depends on having the ability to monitor the airspace in question and then react to violations of the NFZ in a reasonably timely fashion without—and herein lies the rub—having to employ (and potentially place at risk) excessively numerous and expensive forces. Saturating a target state's airspace with a huge number of patrolling fighters could have served as the basis for an NFZ in the 1930s, but would hardly have been economical enough to be an interesting strategic option for policymakers. Thus, it is not surprising that the NFZ came into its own only in the era of jet

³ In U.S. joint doctrine, an NFZ is a type of exclusion zone that “a sanctioning body establishes . . . to prohibit specific activities in a specific geographic area” (Joint Publication 3-0, *Joint Operations*, August 11, 2011, pp. V–13). Note that, as its name implies, an NFZ as defined here focuses only on preventing the use of aviation; in recent policy debates, the term has often been used as a shorthand label for other types of aerial intervention as well.

⁴ For the sake of completeness, it may be worth noting a fourth feature of the definition, which is that NFZs per se apply only to atmospheric flight, not spaceflight.

fighters and, above all, airborne early warning and control (AEW&C) aircraft, such as the iconic E-3 Sentry, that can efficiently monitor air activity over large swaths of unfriendly territory.⁵

Nevertheless, the conceptual roots of the no-fly zone predate the jet age, most obviously in the naval blockade. Used for centuries as a tool of warfighting to weaken an enemy's economy (as well as contain hostile warships in port), blockades could also be imposed separately from other military operations to place coercive pressure on the target country by denying it access to imported goods (either specific categories designated as contraband or across the board) or export markets. Blockades may also be imposed on a very limited basis, for example in the enforcement of arms embargos.

Perhaps the earliest aerial precursor of the NFZ was the post-1918 prohibition on military aviation placed on Germany under the Treaty of Versailles. This was not a no-fly zone as the term is being used here—Germany was prohibited not merely from flying warplanes but from possessing an air force altogether.⁶ However, it represented an early recognition that denying a modern country the military benefits of flight would impose a serious constraint on its potential to emerge and act as a great power.

Between the world wars, aerial policing of colonial possessions became a popular policy instrument for several European powers, most famously Great Britain as it sought to manage a sometimes-restive empire at minimal cost (and as the newly established Royal Air Force sought to demonstrate its utility).⁷ This was in some ways far removed from the idea of a no-fly zone, given the absence of aviation among the target populations, but it grew out of a similar desire to exercise power over weaker adversaries economically by exploiting control of the air. When modern NFZs emerged in the 1990s, it would not take long for the distinction between NFZ enforcement and aerial policing to become blurred in practice.⁸

Bosnia: Operation Deny Flight

The archetypal modern NFZ, and one of the most literally named military operations in an era during which such labels would become the norm for the United States, was Operation Deny Flight, which the North Atlantic Treaty Organization (NATO) conducted over Bosnia-Herzegovina during its civil war following the dissolution of Yugoslavia. It began in October 1992 under the name Operation Sky Monitor in response to United Nations Security Council Resolution (UNSCR) 781, which prohibited military flights over Bosnia and called on member

⁵ The Boeing E-3, operated by the United States and several allied air forces, is better known as the AWACS (Airborne Warning and Control System). The U.S. Navy operates the carrier-based Northrop Grumman E-2 Hawkeye in the same role.

⁶ This prohibition survived until Adolf Hitler came to power. In the years prior to 1933, Germany covertly redeveloped its military aviation program under the guise of the state airline, glider clubs, and other subterfuges.

⁷ James S. Corum and Wray R. Johnson, *Airpower in Small Wars*, Lawrence, Kan.: University Press of Kansas, 2003, Chapters 1–2.

⁸ The descriptions of the Bosnian and Iraqi NFZs that follow are based in large part on data superbly compiled by RAND research assistant Abby Doll.

states to help monitor adherence to the NFZ. In April 1993, after UNSCR 816 extended the ban to prohibit all fixed- and rotary-wing flights over Bosnia, NATO began Operation Deny Flight to enforce the NFZ. The operation was commanded from NATO's combined air operations center at Vicenza, Italy, with enforcement mission sorties generally flying from bases in Italy or France and from aircraft carriers offshore.

The Deny Flight mandate was extended beyond the NFZ function in June 1993 to include providing close air support (CAS) as needed to protect United Nations (UN) peacekeeping forces in Bosnia, and later in Croatia, and to protect UN-designated safe areas that were established in a number of Bosnian population centers. Over more than two years, NATO would fly some 50,000 Deny Flight combat air patrol and CAS sorties, along with a similar number of support and training sorties, although actual strikes were very infrequent. At the end of August 1995, the NFZ mission was supplanted by the Operation Deliberate Force air campaign against the Bosnian Serb Army after it overran the Srebrenica and Žepa safe areas; by this point, fewer than ten CAS or offensive air strike missions had been approved through the NATO-UN dual-key system and carried out by U.S., British, French, Spanish, and Dutch fighters. Two NATO aircraft were shot down over the course of the campaign, and two more were lost in noncombat incidents, but all aircrew were rescued. U.S. Air Force F-16s shot down four Bosnian Serb light attack aircraft in the operation's single lethal air-to-air combat incident.

Iraq: Operations Provide Comfort, Northern Watch, and Southern Watch

The NFZs imposed on Iraq during the period between the 1991 Gulf War and the 2003 invasion of Iraq began in the immediate aftermath of the former conflict, when coalition commander General Norman Schwarzkopf laid out terms for the ceasefire that ended Operation Desert Storm. Improvising in the absence of guidance from Washington, Schwarzkopf ordered that Iraqi fixed-wing warplanes in the region remain grounded but permitted the Iraqi army to fly helicopters in the expectation that these would be important in its redeployment from Kuwait and southern Iraq. This decision surprised the Iraqis, as it gave them free rein to employ helicopter gunships to help the Iraqi army crush the postwar uprising against Saddam Hussein's regime by southern Iraqi Shiites that President Bush had encouraged but that the United States did not subsequently support.

This ad hoc NFZ would soon be replaced by a pair of NFZs in northern and southern Iraq. The northern NFZ was established in the airspace north of latitude 36° North to protect Iraqi Kurds from regime attacks initially under Operation Provide Comfort (which also, as the name implies, included providing humanitarian aid to the Kurds) and later under Operation Northern Watch (ONW). This NFZ prohibited flights by Iraqi fixed-wing aircraft or helicopters. U.S., British, and Turkish aircraft enforcing the NFZ operated primarily from Incirlik Air Base in Turkey and flew more than 75,000 sorties of all types between 1991 and 2003.

Operation Southern Watch (OSW), designed to protect southern Iraq's Shia population from depredations by the Baghdad regime, was initially established in June 1992 south of 32° North,

but this was expanded to 33° North in 1996. Like its northern counterpart, OSW prohibited Iraqi fixed- and rotary-wing flights in the zone. OSW was conducted by U.S., British, French, and Saudi aircraft operating from bases in Saudi Arabia and other Gulf states and from aircraft carriers in the Gulf; the operation ultimately comprised some 150,000 sorties. Unlike the well-armed Kurds, Saddam's opponents in southern Iraq were ill equipped to defend themselves against the Iraqi army, and the NFZ ultimately did little to protect them from the regime's suppression.

Iraqi forces frequently challenged both NFZs. A handful of Iraqi Air Force jets were shot down by U.S. fighters, but most of the combat involved air defense systems illuminating or shooting at patrolling aircraft and U.S. and allied aircraft striking Iraqi targets in response. These retaliatory strikes reached a relatively high degree of intensity by the early 2000s, to the point that the Iraqi integrated air defense system (IADS) had been comprehensively mauled prior to Operation Iraqi Freedom, the invasion that began in April 2003 and effectively ended the Iraqi NFZs. The Iraqis failed to shoot down any coalition aircraft during the operations despite the large number of sorties, although a small number of Predator drones were reportedly lost and, in a 1994 friendly-fire incident, two ONW F-15s mistakenly shot down a pair of U.S. helicopters.

Libya: Operations Odyssey Dawn and Unified Protector

In current policy discussions, the 2011 aerial intervention in Libya looms very large as a seemingly successful example of an NFZ. Anti-Qaddafi forces centered around Benghazi rose in rebellion against the Libyan dictator in February 2011, and when the regime's forces began moving to crush the rebels, airstrikes by Libyan Arab Republic Air Force jets and helicopter gunships were prominently featured in video accounts of the fighting. Political leaders and other actors in the Arab world and the West soon began advocating the imposition of an NFZ over Libya, a call that was endorsed by the Gulf Cooperation Council, the Arab League, and finally by the United Nations in UNSCR 1973, which also included an arms embargo against the Libyan regime and a mandate to use airpower to help protect civilians. Under this banner, Britain, France, the United States, a number of other NATO allies, and several non-NATO partner states conducted a seven-month military intervention in the conflict, relying almost entirely on airpower based in Europe and on naval vessels in the Mediterranean. This intervention enabled the Libyan rebels to survive, develop into an effective fighting force (with substantial external assistance), and then attack and defeat the forces of Qaddafi's regime.⁹

The 2011 air campaign was a notable success, at least in immediate terms, leading to the intervening powers' desired military result while costing them very little.¹⁰ However, several

⁹ See Christopher Chivvis, *Toppling Qaddafi: Libya and the Future of Liberal Intervention*, Cambridge: Cambridge University Press, forthcoming.

¹⁰ It is not yet possible to seriously assess the long-term balance of strategic costs and benefits from the Libyan intervention, since this will depend on how the postwar political fabric of Libya develops in coming years. However,

features of the campaign are important to note when identifying it as a precedent for the effective use of NFZs. First, what was called a no-fly zone in Libya in fact comprised both a traditional NFZ and a far more substantial and significant effort to comprehensively and preemptively destroy Libyan airpower and air defenses in the opening days of the campaign using hundreds of air-to-ground sorties and cruise missile strikes against airfields, surface-to-air missile (SAM) sites, radars, and other targets. Once this phase of the campaign was complete, the NFZ remained in place, but the Libyan government no longer had the ability to use airpower. Second, the NFZ, even so defined, was not conducted in isolation, but in concert with the “civilian protection” mission, which entailed air strikes against Libyan regime ground forces and related military installations, and in parallel with the effort to train and equip the Libyan rebels. Thus, the Libyan NFZ was part of a notably successful military operation, but it was far from the most important component, so to characterize the campaign as a successful NFZ is comparable to describing the defeat of Germany in World War II as a successful naval blockade.

Variations on the Theme NFZ

As these recent examples demonstrate, NFZs are not all alike. NFZs can vary along a number of dimensions, with the two most salient being the actions that are prohibited and how the enforcers of the NFZ decide to deal with the threats posed by the target’s air defenses.

Drawing a Line in the Sky

The most basic parameters of an NFZ are what it restricts or prohibits and where. The term *no-fly zone* implies that no flights by aircraft will be allowed within the boundaries specified for an NFZ, but it need not be all or nothing. An NFZ might proscribe flights by military but not civilian aircraft, it might prohibit flights by fixed-wing aircraft but not helicopters (like the terms set for Iraq after the 1991 ceasefire), or it might allow flights by prearrangement with the enforcing authority. An NFZ might also be specific to one party in a conflict rather than apply to everyone. *De facto* prohibitions may also diverge from formal ones. For example, in practice, the Deny Flight NFZ over Bosnia was not effective at prohibiting short flights, particularly by helicopters, because the density of the patrolling forces was insufficient to enable quick interceptions against very brief flights, but this was accepted as a limitation of the campaign.

The rules of engagement (ROE) of NFZs can also vary with respect to enforcement mechanisms. For example, will only aircraft violating the NFZ be subject to attack, or will retaliation extend to striking the airfields from which they took off? The rules for enforcement may vary depending on the circumstances even when the proscriptive terms of the NFZ do not: in particular, a shoot-on-sight policy might be adopted for military aircraft violating an NFZ, while civilian aircraft might be treated more cautiously to avoid unintended shootdowns or

the fact that this remains a source of great uncertainty, and indeed unease, among the intervening powers illustrates the limitations of NFZs and other interventions conducted with very limited direct political involvement.

unfavorable political consequences, and as a matter of adherence to the principle of discrimination in the law of armed conflict.

Dealing with Air Defenses

An additional factor of great import in deliberations about establishing NFZs is how air defenses will be handled. Traditionally (to the extent that it is possible to characterize NFZs as having traditions, given the small and recent list of examples), air defenses that attack aircraft patrolling to enforce the NFZ will be subject to retaliatory strikes, and of course interceptors taking off would automatically be in violation of the NFZ. However, there are a number of gray areas that would need to be addressed in the ROE, whether formal or informal:

- Will suppression of enemy air defenses (SEAD) strikes be limited to the specific SAM or antiaircraft artillery (AAA) site that fired at the patrolling aircraft, or does such an attack make other elements of an IADS, such as command and control facilities or other SAM/AAA sites, liable to retaliatory attack?
- Will tracking an aircraft with a fire-control radar be treated as a hostile act calling for retaliatory SEAD even if no shots are fired by the associated SAM or AAA system?
- Will all attacks directed against aircraft imposing the NFZ be triggers for response, or will trivial ones (such as light AAA shooting at aircraft that are out of range) be ignored?
- Will strikes only be launched in immediate response to attacks, or will weapons or systems that fired at NFZ aircraft be considered fair game for counterattacks days or weeks after the initial provocation?

Beginning in 2011 with discussions of establishing an NFZ over Libya, a new element was added to considerations of the relationship between NFZs and SEAD. In response to calls for a Libyan NFZ, U.S. military leaders declared that, as a matter of course, any NFZ over Libya would need to begin with a comprehensive, preemptive SEAD and offensive counter-air (OCA) campaign to eliminate Libyan airpower and air defense capabilities that might be used to interfere with NFZ enforcement. Rather remarkably, this principle rapidly became accepted within the policy debate even though it did not represent an established norm in NFZ practice.¹¹ It currently appears that in the wake of the Libyan operation, the idea that future NFZs should or must begin with extensive destruction of enemy air defenses (DEAD) campaigns continues to

¹¹ Although the Libyan “NFZ” was a departure from previous NFZs, the situation was different as well. In Iraq, OSW and ONW had been preceded by the Gulf War air campaign, which had badly degraded Iraq’s air defenses, while in Bosnia, the Serb forces had relatively meager air defenses, even compared to Libya’s.

The assertion that an NFZ would require the preemptive demolition of Libyan air defenses initially served the interests of those who wanted to avoid intervening in Libya by making the establishment of an NFZ a more dramatic military step than it would have been under Bosnia-like ROE. Later, as support for intervention grew, it protected the intervening air forces from being directed to undertake an intervention under highly restrictive ROE and also came to serve the interests of those who supported a Libyan NFZ but actually desired a more energetic intervention by the international community. When the campaign began in late March 2011, all strikes against Libyan airbases and air defense-related targets were collectively classified as “no-fly zone enforcement” regardless of whether their targets were actually involved in NFZ violations.

carry weight—this has been a commonplace assumption in debates about imposing an NFZ in Syria—although how persistent this belief will be is not yet clear.

In effect, Operation Odyssey Dawn did not represent a new approach to NFZs as much as an alternative way to deny the target state the military benefits of using airpower:

- The coercive Combat Air Patrol (CAP) model (a “true” NFZ, as in Operation Deny Flight) is based on deterring the adversary from flying by patrolling an exclusion zone and intercepting, identifying, and forcing or shooting down the aircraft that violate it. Enemy air defenses that attack or threaten (depending on ROE) the enforcing aircraft are likewise attacked.
- The brute force Offensive Counter-Air (OCA) model addresses the same problem by simply eliminating the adversary’s ability to fly by destroying aircraft or bases, likely combined with a comprehensive attack on its air defense system, as in OOD.¹²

The first-order strategic effect of the two models is similar. However, their requirements and uncertainties differ. Under the CAP model, a relatively small force can maintain an NFZ provided that fear of enforcement actions persuades the affected state to respect it, but constant vigilance is required to respond to challenges, and ambushes by air defenses remain a persistent risk. The OCA model requires considerable effort in the early stages for its intensive attacks on airbases and defenses, but once the opponent’s ability to fly or fight back is largely eliminated, maintaining the NFZ should be comparatively simple—and safer. Both models constitute acts of war; the CAP model is based on a more limited use of force, but whether it remains limited will depend on the response it elicits.

No-Fly Zone Objectives, Limitations, and Options

Turning now from considering the “how” of NFZs to the “why,” it is critical to recognize that this policy instrument can be used for a variety of purposes, six of which are described in this section. These are not mutually exclusive, but NFZs will not always have the same objectives, and taking into account the differences among their strategic purposes is central to both making good strategy and evaluating its ultimate success or failure.¹³

In the end, assessing the conditions under which NFZs hold the greatest promise of strategic value, and how great that value might be, is largely an exercise in deductive reasoning; the relatively few historical examples of the art form that we can examine are instructive but cast only patchy illumination on the subject. Not surprisingly, the answers depend on the purpose of the NFZ and the ways in which its goals are intended to be achieved.

¹² In theory, one might mount a major attack against either an opponent’s air force or air defenses, but not both. However, assuming the adversary possesses both, there is unlikely to be reason to strike its air defenses while leaving its airpower unharmed, and an attack to destroy its airpower on the ground will almost certainly provoke intense air defense activity, leading to widespread strikes against SAMs and related targets.

¹³ The same is true of many types of strategic policy. Economic sanctions are employed for a number of reasons in addition to the goal of coercing the target state into compliance with the overt demands of the power imposing them.

Preventing the Use of Airpower

Keeping a target state from using its airpower against civilians or others one wishes to protect is perhaps the most obvious NFZ objective and almost certainly the most likely to be declared, as in the cases of Operation Deny Flight, ONW/OSW, and OOD/OUP. It is, of course, only relevant in cases in which the targeted actor has been using (or is expected to use) airpower in ways that are desirable (and feasible) to prevent. In the short term, as illustrated by the Deny Flight NFZ, this may amount merely to protecting people from aerial attack. Over the longer run, the goal of an NFZ might be to alter the outcome of a conflict at a more strategic level, enabling probable losers to become victors (as in Libya) or averting an expected victory by the stronger side so that a settlement might be negotiated.

The ability to change the outcome of an armed conflict by preventing one or more belligerents from using airpower depends, naturally, on how important the use of airpower is to their prospects for military success. Some states rely heavily on airpower for their military might, but these tend to be advanced, mostly Western powers. Countries such as Iraq and Libya, with more-limited resources and less-capable air forces, mainly wield power through their armies, and this is particularly true in internal conflicts fought at close range and often in populated areas. Thus taking away their ability to conduct aerial bombardment against their enemies, to employ air support on or beyond the battlefield, or to provide air mobility for their ground forces will typically have an effect only at the margins. Therefore, while denying the use of airpower may matter a great deal in conflicts involving relatively evenly matched forces, it is unlikely on its own to reverse the course of a more uneven fight. Of course, some actors make little or no use of airpower at all, or use it with little effect, in which case an NFZ might only interfere with their military operations by preventing aerial resupply from outside supporters.

Coercing Adversaries

Instead of, or in addition to, directly producing results by preventing enemy use of airpower, an NFZ can be imposed and maintained as a coercive lever to pressure the target to change its behavior (beyond not violating the NFZ) or to comply with other demands.¹⁴ The potential for successful coercion depends on how painful or threatening the NFZ is to the adversary state or to influential people within it, who also need to believe that the NFZ will be lifted in return for submitting to the coercive demands. If being denied the use of airpower imperils the target's security by making it vulnerable to an internal or external enemy, the coercive potential of an NFZ could be quite high, but such cases are not likely to be common.

As with all coercion, the magnitude of the stakes—how motivated the target is to resist the coercer's demands—will be vastly important. The same pressure that will seem trivial when severe demands are being made may be persuasive if giving in seems like a relatively minor

¹⁴ See, for example, Annelie Gregor, "Limited Military Pressure: An Analytical Framework to Assess No-Fly Zones as a Single Instrument in Coercive Diplomacy," Master's thesis, Swedish National Defense College, June 4, 2012.

matter.¹⁵ However, as a generalization, NFZs should not be expected to be powerful coercive instruments—the reason NFZs tend to be attractive policy options is that they are a milder form of sanction than most other uses of military power. Moreover, at least when used in isolation, the costs they impose will tend to accumulate gradually and thus will not typically create powerful incentives for the target to submit quickly rather than delay in the hope that the situation will improve farther down the road.

Preparing Future Battlefields

The remaining objectives on this list are less likely to be overt justifications for NFZs than are protection and coercion, but the declared purposes for a policy may not reflect its real motivations—or the goals embraced at first may evolve over the course of a campaign. The latter was certainly true in the Iraqi NFZs, which began with the objective of protecting Iraqi Kurds and Shia from the national government but developed into relatively intensive SEAD/DEAD campaigns that facilitated air operations in the subsequent invasion of Iraq. However, even in the absence of such “kinetic” operations, maintaining an NFZ can contribute to preparedness for subsequent air operations through the collection of imagery and electronic intelligence, the development of bases, and familiarization and practice for the forces to be involved later. It can also erode the enemy air force’s capabilities by keeping its pilots grounded, even if it does not seek out and destroy enemy aircraft when they do not fly (though an active NFZ might give plenty of practice to personnel manning an IADS).

Weakening Potential Enemies

In addition to weakening a target militarily, a no-fly zone might, in theory, play a role in undermining it economically or even politically, though this is arguably the least likely purpose for an NFZ. Giving the impression that an enemy regime is weak or incompetent by showing that it cannot defend its own airspace might diminish its prestige or embolden its enemies. Also, denying the benefits of air commerce to a state that enjoys them could reduce its economic resources.

More likely, and probably more potent, would be an air blockade in which an NFZ complements land or maritime operations to isolate a target state from external trade in general or from access to particular imports, which could be undertaken either to weaken the target (like the West’s embargo on high-technology exports to the Soviet bloc during the Cold War) or to coerce it. However, in most cases, such interdiction of aerial commerce would take place outside of the enemy’s airspace and achieved by preventing flights rather than intercepting them.

¹⁵ Karl P. Mueller, “The Essence of Coercive Air Power: A Primer for Military Strategists,” *Royal Air Force Air Power Review*, Vol. 4, No. 3, Autumn 2001, pp. 45–56.

Political Posturing

The two final entries on this menu of objectives are closely related, and both are essentially political but should not be dismissed as superficial. Even if it is unlikely to actually help them, an NFZ might appear very attractive as a way of showing sympathy or moral support for those it is portrayed as protecting, especially if appearing to be doing nothing to help is politically costly. Similarly, coercive actions of many types are often pursued less because they are expected to bring the target to heel than because it seems politically imperative for the sanctioning government to do *something* in response to a crisis or provocation (consider the U.S. grain embargo and Olympic boycott in response to the 1989 Soviet invasion of Afghanistan, for example). Such gestures are empty on one level but may nevertheless be of profound importance to those carrying them out.

Imposing an NFZ as a form of political theater entails risk, however, in two ways. First, it is easy to be trapped by one's own rhetoric. Having condemned the adversary's behavior and established an NFZ, if the results appear unsatisfactory for solving the problem, it may be difficult not to escalate in pursuit of a better outcome. Alternatively, if more-effective follow-on measures are not feasible or are not worth their cost, an NFZ that appears to have been a failure may appear in time to have been a policy blunder, to the regret of those who advocated it.

Signaling or Creating Commitment

Finally, there is a closely related but more substantial political motivation for establishing a no-fly zone. Creating an NFZ can make it easier to escalate later to other military operations that are more intensive. Conversely, it may also make it harder *not* to do so—it can be used to intentionally make it difficult to walk away and let a defiant opponent prevail. Imposing an NFZ might also be politically useful to muster domestic or international support for further military action by showing that more-restrained approaches had already been attempted without success before resorting to stronger intervention measures.¹⁶ Similarly, the expectation that an NFZ represents the beginning of a broader or deeper commitment may hearten an ally and encourage it to hold out or fight on in the face of difficulty, as it did for the Libyan rebels in March 2011.

Future Employment of No-Fly Zones

As the preceding discussion suggests, there are many situations in which imposing an NFZ promises little reward. However, when an NFZ does appear to offer value, some basic principles can help maximize the chances of achieving coercive benefits.

¹⁶ These are often prominent and more-familiar motivations for the imposition of economic sanctions as well.

Maximizing Coercive Potential

If one seeks to use an NFZ to apply coercive pressure against an opponent—though, as discussed above, this is only one of several possible strategic goals for an NFZ and is, perhaps, the most challenging—many issues associated with credibility, the communication of threats and promises, and a variety of other factors arise that are not specific to NFZs. However, there are several considerations worth noting that relate particularly to maintaining NFZs and are closely interconnected.

Persistence. Typically, true NFZs will need to be maintained for prolonged periods, or at least those imposing them will want to be prepared for this possibility. This, of course, requires that the commitment of forces and the required resource expenditures be sustainable—and appear so to the opponent—for the relatively long haul, lest the target of the NFZ decide that time is on its side and simply wait for the effort to peter out. The political will to carry on with the operation should also be made to look open-ended. Ideally, the opponent should be made to face the additional prospect that if the NFZ does not achieve its objective, those imposing it will be able and willing to escalate to a more irresistible use of force.

Invulnerability. A central, though not the only, factor in shaping such perceptions of determination will be the ability of those imposing the NFZ to sustain it effectively without suffering significant losses. If the aerial presence necessary to enforce the NFZ can be maintained with impunity, the opponent will have a far harder time believing that holding out is pointless than if the enforcing aircraft can be shot down in sufficient numbers to raise doubts about the durability of the NFZ. Moreover, resisting an NFZ has more political upside if the enemy is being forced to pay a visible price in blood and airframes than it does if shooting at the enforcing aircraft accomplishes nothing except the attrition of one's own air defenses.

Risk. Depending on their ROE and enforcement mechanisms, NFZs can entail peculiar risks that enforcers will want to prepare for in advance. One of these is the likely need to intercept civilian aircraft, or purportedly civilian ones, in ways that do not require shooting them down and producing mass casualty incidents that could be politically catastrophic. It is prudent to expect that states subjected to NFZs might seek to manufacture such incidents. (Opportunities to do so can be reduced by preemptively disabling enemy airfields, but in such militarily assertive campaigns, other possibilities for creating civilian casualty incidents will arise.)

Policy integration. While this report undertook to examine the use of NFZs as standalone military options, one of its most significant conclusions is that an NFZ used in isolation is, and logically ought to be, a rarity. In many cases, an NFZ that is coordinated with other military or nonmilitary policy elements may represent an interesting option where an NFZ alone would not. The integration of NFZs with blockades, economic or diplomatic sanctions, “no-drive zones,” or other strategy components is a subject for a larger discussion but should be a central matter of concern for anyone considering or planning an NFZ.

Looking Toward Syria

The question of the moment regarding NFZs is whether the United States and its allies ought to impose one in response to the ongoing Syrian civil war. This debate has not been the focus of this brief report because it is a question that merits a much longer analysis addressing many of the issues introduced above but going well beyond them.¹⁷ However, several points are worth calling out here.

First and most fundamentally, it is important to recognize that the term *no-fly zone* can be and is used to refer to a variety of different things, and those differences matter. A Syrian NFZ that began, like Operation Odyssey Dawn, with a sustained campaign to demolish the aged but extensive Syrian IADS and air force would be a very different proposition, both politically and militarily, than one conducted along the far more restrained lines of Operation Deny Flight. Similarly, imposing only an NFZ per se on Syria would be considerably less ambitious than striking other military targets to protect safe areas from threats other than air attacks or directly weaken the Syrian army, which the NFZ label is sometimes confusingly stretched to include. However, an NFZ alone would also be less significant, since most of the firepower being employed against the Syrian rebels, and against civilians either deliberately targeted or caught in the crossfire, is coming from forces on the ground, not in the air.

On the other hand, Syria does meet the most basic threshold requirement for consideration as a possible NFZ target: the government does use airpower in the conflict (for both strike and airlift) to a degree that is visible and consequential. Denying it this capability would be politically noteworthy and might be militarily significant, since the conflict between the government and the rebels is sufficiently balanced to have dragged on for several years, recent regime successes notwithstanding. Establishing a Syrian NFZ could well pave the way for more-extensive military intervention—this will strike some as being a point in favor of the option, but for others this potential for “mission creep” is a matter of great concern.

Properly analyzing the operational challenges involved in imposing a Syrian NFZ would involve a detailed discussion of Syria’s air defenses, basing and overflight possibilities, and a number of other considerations extending beyond the scope of this report. However, the political dimension appears, at least at present, to be simpler in one respect: prospects for a broad-based international mandate such as the UNSCRs that underpinned the Bosnian and Libyan NFZs look very dim. In the absence of such a mandate, it is hard to picture a comparatively unilateral NFZ appearing politically palatable to enough Western and Middle Eastern governments to make the option viable.¹⁸ However, the possibility of these conditions changing in response to spectacular atrocities or a greatly heightened atmosphere of crisis in the civil war should not be ruled out.

¹⁷ See Karl P. Mueller, Jeffrey Martini, and Thomas Hamilton, *Airpower Options for Syria: Assessing Objectives and Missions for Aerial Intervention*, Santa Monica, Calif.: RAND Corporation, RR-446-CMEPP, 2013.

¹⁸ The minimum militarily plausible coalition required to conduct a Syrian NFZ would appear to be a U.S.-Turkish partnership. Other participants might enable such an operation to go ahead without full-blown Turkish involvement. Imposing some sort of NFZ without substantial U.S. participation is theoretically possible but would call for a

Vectors for Future Research

The track record of NFZs is not so much weak as it is scanty, so understanding what they might accomplish in the future, and what they should not be expected to achieve, is not merely a matter of assessing their past performance. However, developing a more-complete picture of the impact of NFZs in places like Bosnia and Iraq would be useful, as these cases are complex enough to merit substantial historical analysis but have been overshadowed as subjects of study by the wars that preceded and followed them.

Further exploration of alternative approaches and concepts of operations for conducting NFZs—whether alone or in conjunction with other operations—would also be worthwhile, both to minimize the costs and maximize the effectiveness of future NFZs. Imposing an NFZ against a relatively weak adversary is not a daunting task, at least conceptually, for the United States. However, finding ways to do it inexpensively in cases in which the stakes are low or resources are limited because of simultaneous air operations elsewhere or because it is not U.S. airpower enforcing the NFZ, is a more challenging proposition, especially if the NFZ will need to be maintained over a prolonged period.

Beyond this, perhaps the most important path to pursue in the study of NFZs is to approach them as a subset of a broader strategic category that might be called “aerial occupation.” The connections, both in theory and in practice, between NFZs and measures such as no-drive zones, naval blockades, and punitive air strikes have been repeatedly noted in this report. These, too, offer ways to take advantage of superior air and other standoff military power to achieve national security objectives with relatively few or no “boots on the ground” and thus with limited risk of friendly casualties and, often, limited political risk and material cost as well. As we move into an era of constrained defense budgets and contracting force structures, limited-liability, moderate-cost strategic approaches for the use of military power are likely to appeal to decisionmakers. Understanding how to do this well and when to counsel against it will be correspondingly essential for those who will be charged to carry out such missions.

sizable combination of states that seems very unlikely to form autonomously of the United States.

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